Commercial, Industrial and Institutional Roofing Materials

GUIDE

Volume 6
February 1985

Replace with
Volume 7 which will
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August 1985

PROFESSIONAL
ROOFING SYSTEMS

Architects
Specifiers
Engineers
Roofing Contractors
Building Owners
Building Managers
Consultants
Construction Contractors
Plant Engineers
Manufacturers of:
Membrane Products
Roofing Insulation
Roofing Products
Salesmen, Jobbers, Wholesalers

NEW!



ROOFING
FACTS:

Section 1:
Membranes

Section 2:
Board Insulation

Published by:
NATIONAL
ROOFING
CONTRACTORS
ASSOCIATION

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LIST OF ROOF MEMBRANES WHICH MEET OR EXCEED STANDARD VALUES

The following is a list of single-ply roof membrane materials which:

A. Are listed in the Guide.

B. Are included in one of the described referenced concensus documents which define test methods and specify minimum test values for various physical properties.

C. Meet or exceed all of the minimum test values as defined in the applicable document based on reported test results supplied by manufacturers/suppliers and as printed in the Part 2 section of the Guide.

No listing is provided for materials which:

A. Are not listed in the Guide, and/or

B. Do not conform to an existing, and referenced, North American consensus document, and/or

C. Do not meet or exceed all of the minimum test values as specified in the appropriate referenced document as reported by manufacturers/suppliers.

No evaluation has been made by NRCA regarding the minimum test values defined in the referenced document versus the actual test results reported by manufacturers/suppliers. Any reported test result less than the exact specified minimum or absence of test data will result in exclusion from the following list.

The user of the Guide must determine if the listing or non-listing of a material in the following list, because of lack of data or because reported test data is below the minimum values specified in the referenced standard, is significant in evaluating materials.

No fee is required for listing membrane products in the Guide. Any manufacturer/supplier may participate by contacting NRCA and completing the necessary forms.

The fact that a listed material does or does not meet all of the values specified in the referenced documents does not necessarily imply that it will or will not produce an acceptable roofing membrane.

The listing of materials which meet or exceed referenced standards will be up-dated in future issues of the Guide. Manufacturers/suppliers are encouraged to present data in conformance with these recognized standards, to support efforts to develop new standards and to encourage the practical use of this information throughout the industry. As new standards are developed they will be incorporated into the Guide program.

Generic Type	Applicable Referenced Document	Product Name
1. Modified Bitumen	CGSB 37-GP-56M/1980: Standard for: Membrane, Modified Bituminous, Prefabricated and Reinforced for Roofing	GEDAGOM GRANIVEL
2. EPDM (Non-Reinforced, Black)	RMA IPR-1/1984: Minimum Requirements for Non-reinforced Black EPDM Rubber Sheets for Use in Roofing Applications	HYDRO-SEAL .045 BLACK HYDRO-SEAL .060 BLACK RUBBERSHIELD 45 BLACK RUBBERSHIELD 45 BLACK FIRE RATED RUBBERSHIELD 60 BLACK SURE-SEAL EPDM .045 SURE-SEAL EPDM .060 SURE-SEAL FR EPDM .045 SURE-SEAL FR EPDM .060 GENFLEX ACR .045 BLACK GENFLEX ACR .060 BLACK ERA-EPDM 245-BLACK ERA-EPDM 260-BLACK EVANITE PERM GLASS DEPEND MEMB .045 BLK EVANTIE PERM GLASS DEPEND MEMB .060 BLK RUBBERGARD .045 RUBBERGARD .060 VERSIGARD .045 VERSIGARD .060 POLYKEN M-45 POLYKEN M-60 POLYKEN MFR-45 POLYKEN MFR-60 SPM 45 SPM 60 REEVETECH .045 REEVETECH .060 SYENERGY RUBBER ROOF .055 BLACK SYENERGY RUBBER ROOF .045 BLACK
3. EPDM (Fabric-Reinforced, Black)	RMA IPR-2/1984: Minimum Requirements for Fabric-Reinforced Black EPDM Rubber Sheets for Use in Roofing Applications	NONE
4. Polychlorphrene (Fabric-Reinforced, Black)	RMA IPR-3/1984: Minimum Requirements for Fabric-Reinforced Black Polychlorprene Rubber Sheets for Use in Roofing Applications	NONE
5. PVC	ASTM, Draft #5/July 1, 1984, Proposed New Standard Specification for Poly (Vinyl/Chloride) Sheet Roofing	SUCOFLEX F-132 SUCOFLEX F-127 NERVAPLY BM NERVAPLY UB SARNAFIL G410 SARNAVIL S327 SARNAVIL G442

INDEX: Roofing Membranes

	Built-Up Roofing	Modified Bitumens	PVC	EPDM	NEOPRENE	CSPE HYPALON	PIB	CPE	Other
1. AGR COMPANY 11016 GRANITE STREET CHARLOTTE, NC 28217 704/588-1962							59		
2. ALKOR DIVISION HEDWIN CORP. 2950 S. SHAVER PASADENA, TX 77502 713/472-1431			38					59	
3. ALLROOF INTERNATIONAL INC 2637 SOUTH DECKER LAKE BLVD SALT LAKE CITY, UT 84119 801/973-2400		22							
4. AMERICAN HYDROTECH, INC. 541 N. FAIRBANKS COURT CHICAGO, IL 60601 312/337-4998				42					
5. AMERICAN LUBRICANTS CO., THE 1227 DEEDS AVENUE DAYTON, OH 45401 513/222-2851		22							
6. AMERICAN ROOFING CORP. 3100 S. CALIFORNIA CHICAGO, IL 60608 312/376-1110		22							
7. APACHE BLDG. PRODUCTS CO. 2025 E. LINDEN LINDEN, NJ 07036 201/486-6723		22							
8. BARRA CORP. OF AMERICA 190 FAIRFIELD AVENUE WEST CALDWELL, NJ 07006 800/526-2291 201/226-2136		23	38	42		57			
9. BARRETT COMPANY, THE 1001 JEFFERSON PLAZA WILMINGTONM DE 19801 800/647-0100 201/647-0100		23							
10. BOND COTE SYSTEMS P.O. BOX 71 WEST POINT, GA 31833 800/368-2160									60
11. BOWE CO., INC. (DIBITEN) 219 SADDLE RIVER ROAD SADDLE BROOK, NJ 07662 201/845-5900		23							
12. BURKE RUBBER COMPANY 2250 SOUTH 10TH STREET SAN JOSE, CA 95112 408/297-3500						57			
13. CARLISLE SYNTEC SYSTEMS P.O. BOX 7000 CARLISLE, PA 17013 717/245-7000				43	57				
14. CELOTEX CORPORATION, THE 1500 N. DALE MABRY TAMPA, FL 33607 813/871-4811	6			43					
15. CENTRAL SOYA COMPANY INC 1300 FORT WAYNE NATIONAL BANK FORT WAYNE, IN 46802 219/425-5100		23							
16. CENTRAL STATES ASSOC. CORP. P.O. BOX 65504 WEST DES MOINES, IA 50265 515/224-4771						57			
17. CERTAINTEED BOX 860 VALLEY FORGE, PA 19482 215/341-7000	7								
18. CIRO ROOFING PRODUCTS, USA INC. 17508 BOTHWELL WAY, N.E. BOTHELL, WA 98011 206/624-1171		24							
19. CONKLIN CO. 4600 W. 77TH ST. MINNEAPOLIS, MN 55435 612/831-4044						58			
20. CONSOLIDATED PROTECTIVE COATINGS CORP. 1801 E. 9TH STREET CLEVELAND, OH 44114 800/321-7886		24							
21. COOLEY RFG. SYSTEMS INC. 50 EASTERN AVENUE PAWTUCKET, RI 02860 401/724-0490								59	
22. DANOSA CARIBBEAN, INC. BOX 13757 SANTURCE STATION SAN JUAN, PR 00908 809/785-4545		24							
23. DIVERSITECH BUILDING SYSTEMS, DIVISION P.O. BOX 875 TOLEDO, OH 43696-0815 419/729-3731			38	43					
24. DUNLOP CONSTRUCTION PRODUCTS INC. 2055 FLAVELLE BLVD. MISSISSAUGA, ONT. CANADA L5K 1Z8 416/823-8200				43		58			
25. DUROLAST ROOFING, INC. 525 MORLEY DRIVE SAGINAW, MI 48601 800/248-0280 800/752-8815									60
26. DYNAMIT NOBEL 10 LINK DRIVE ROCKLEIGH, NJ 07647 210/767-1660			38						
27. ERA CORP. 6449 BARRIE ROAD MINNEAPOLIS, MN 55435 612/925-6000				44					
28. EVANITE PERMAGLAS INC. P.O. BOX E CORVALLIS, OR 97339 503/753-1211				44					
29. FIRESTONE BUILDING PRODUCTS CO 3500 W. DEPAUW BLVD. PYRAMID #3, 4TH FLOOR INDIANAPOLIS, IN 46268 800/428-4442				45					
30. FLEX-SHIELD CORP. 636 W. COMMERCE GILBERT, AZ 85234 602/892-9320	9	25							
31. GARLAND CO.,INC.,THE 3800 E. 91ST STREET CLEVELAND, OH 44105 216/641-7500		25							
32. GATES ENGINEERING CO., INC. 100 SOUTH WEST STREET WILMINGTON, DE 19801 302/656-9951				45	57	58			
33. GEDACO LTD. VIA BUSSE 23 ROVERCHIARA (VR) ITALY 37050 39-442-74288 TELEX: 481032 GEDACO I FACTORY REPRESENTATIVE: 6 ATLAS COURT HUNTINGTON, NY 516/271-2767 SALES AGENT: 122 LAKEVIEW AVE. LEONIA, NJ 07605 201/592-9108		25							
34. GENSTAR ROOFING PRODUCTS 580 DECKER DRIVE IRVING, TX 75062 214/659-9800	11	26							
35. GOODYEAR TIRE & RUBBER COMPANY, THE 1144 E. MARKET ST. AKRON, OH 44316-0001 216/796-4421				45					
36. GUAINA CORP. OF AMERICA & POLYPREN ROOFING OF AMER. P.O. BOX 1205 HACKENSACK, NJ 07602 201/343-0181		26							
37. GAF CORPORATION 1361 ALPS ROAD WAYNE, NJ 07470 201/628-3000	9								
38. HEY´DI U.P.M. 2801 CRUSADER CIRCLE VIRGINA BEACH, VA 23456 804/468-2200		26							
39. HITCHINS AMER. INC. P.O. BOX 3449 LONGWOOD, FL 32750 305/869-5110		26							
40. HYLOAD, INC. 1006 MCKNIGHT PARK DRIVE PITTSBURGH, PA 15237 412/367-0633		26							
41. INDEX SPA TECHOLOGIE IMPERMEABILI VIA G. ROSSINI, 22 37060 CASTEL D´AZZANO VERONA, ITALY 045/512233-R.A. TELEX 341146 INDEX-1		27							
42. INTERNATIONAL EPDM RUBBER ROOFING SYSTEMS, INC. 5110 ANGOLA ROAD TOLEDO, OH 43615				45					
43. IPW INTERPLASTIC 156 LUDLOW AVENUE NORTHVALE, NJ 02021 201/767-8073			39						

INDEX: Roofing Membranes

	Built-Up Roofing	Modified Bitumens	PVC	EPDM	NEOPRENE	CSPE HYPALON	PIB	CPE	Other
44. J & P PETROLEUM PRODUCTS P.O. BOX 4206 DALLAS, TX 75208 214/291-1591		27							
45. KELLY ENERGY SYSTEMS INC. P.O. BOX 2583 WATERBURY, CT 06723 203/575-9220		27		45		58			
46. KENDALL COMPANY POLYKEN ROOFING SYSTEMS ONE FEDERAL STREET BOSTON, MA 02101 617/423-2000				47					
47. KIMMENADE CORP., THE 12820 PENNRIDGE DRIVE ST. LOUIS, MO 63044 314/739-4594		27							
48. KOPPERS 1301 KOPPERS BUILDING PITTSBURGH, PA 15219 412/227-2000	11								
49. LUNDAY THAGARD CO., INC. 9302 S. GARFIELD SOUTHGATE, CA 90280 213/773-4244	12								
50. MALARKEY ROOFING COMPANY, HERBERT 3131 N. COLUMBIA BLVD. PORTLAND, OR 97217 503/283-1191	14	27							
51. MANVILLE BLDG. MAT'LS CORP. P.O. BOX 5108 KEN-CARYL RANCH DENVER, CO 80217 303/978-2000	15			47					
52. MINERAL FIBER MFG. CORP. P.O. BOX 356 313 SOUTH SIXTH STREET COSHOCTON, OH 43812 614/622-2645	17								
53. NORD BITUMI U.S., INC. 966 S. SPRINGFIELD AVE. SPRINGFIELD, NJ 07081 201/467-8669		27							
54. OTTO FABRIC, INC. P.O. BOX 18361 WICHITA, KS 67218 316/686-2010 800/835-3347									60
55. OWENS-CORNING FIBERGLAS CORP. FIBERGLAS TOWER TOLEDO, OH 43659 419/248-8000	17	28							
56. PANTASOTE, INC. 26 JEFFERSON STREET PASSAIC, NJ 07055 800/922-0812			39			59		59	60
57. PROTECTIVE COATINGS, INC. 1602 BIRCHWOOD AVENUE FORT WAYNE, IN 46803 219/422-7503				47					
58. PMS/SUCOFLEX 13324 HAWTHORNE BLVD. #202 P.O. BOX 1783 HAWTHORNE, CA 90250 213/978-2003			39						
59. REEVES BROS., INC. P.O. BOX 1531 SPARTANBURG, SC 29304 803/576-9210				47					
60. REPUBLIC POWDERED METALS 2628 PEARL ROAD MEDINA, OH 44256 216/225-3192							59		
61. ROYAL OIL COMPANY P.O. BOX 646 FT. WORTH, TX 76101 817/332-7001		28							
62. RUBBER & PLASTICS COMPOUND, INC. 3615 23RD STREET LONG ISLAND CITY, NY 11106 212/392-6780			39						
63. SARNAFIL INC. CANTON COMMERCE CENTER P.O. BOX 380 CANTON, MA 02021 617/828-5400			39						
64. SEAL-DRY/USA, INC. BOX 486 S. OPDYKE RD. PONTIAC, MI 48057 313/333-2590									60
65. SEAMAN CORPORATION 102B N. WASHINGTON STREET MILLERSBURG, OH 44654 216/674-0121									60
66. SIPLAST, INC. HWY. 67 SOUTH ARKADELPHIA, AR 71923 501/246-8094		28							
67. STEVENS & CO. INC., J.P. 26 PAYSON AVENUE EAST HAMPTON, MA 01027 413/527-0700						59			
68. SYENERGY METHODS, INC. 1367 ELMWOOD AVENUE CRANSTON, RI 02910 401/467-2600				48					
69. SWEPCO 534 NORTH MAIN STREET FT. WORTH, TX 76101 817/332-2336		29							
70. TAMKO 220 WEST 4TH STREET JOPLIN, MO 64802 417/624-6644	20	29							
71. TELTEX, INC. COMMERCE DRIVE N. BRANFORD, CT 06471 800/243-6258		29							
72. TEXAS REFINERY CORP. ONE REFINERY PLACE FT. WORTH, TX 76101 817/332-1161		29							
73. TREMCO, INC 10701 SHAKER BLVD. CLEVELAND, OH 44104 216/292-5000	21	29				59			
74. TRI-PLY INC 1401 E LINCOLN MADISON HEIGHTS, MI 48071 313/543-7910		30							
75. TROPICAL INDUSTRIAL COATINGS, INC. P.O. BOX 444 BRUNSWICK, OH 44212 216/273-2564 800/321-8353		30					59		
76. U.S. INTEC INC./BRAI P.O. BOX 2845 1212 BRAI DRIVE PORT ARTHUR DRIVE PORT ARTHUR, TX 77640 409/724-7024		30							
77. W.R. GRACE & CO 62 WHITTEMORE AVENUE CAMBRIDGE, MA 02140 800/242-4476		30							
78. WAT-PRO, INC. P.O. BOX 336 MANASQUAN, NJ 08736 201/528-6727			39	48					
79. WEATHERGARD ROOFING SYSTEMS, INC P.O. BOX 11187 MEMPHIS, TN 38111 901/458-2222 800/USA-EPDM				48	57				

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BUILT-UP ROOFING: General Information with Test Description and Suggested Values As Specified in NBS BSS #55/1974

CELOTEX
1.REGIONAL SERVICE LOCATIONS-6
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-DISTRIBUTORS,DIRECT TO ROOFERS
5.PREFORMED ACCESS. AVAIL (YES/NO)-NO
6.LIMATIONS/RESTRICTIONS-SEE CELOTEX BUR MANUAL
7.SALES/TECH INFO-A.G. SPINGLER/S.A. FUNK
FELTS DATA: TRADE NAME (APPLICABLE ASTM STANDARD)
CELO-GLASS IV(D2178-82-A TYPE IV)
VAPORBAR GB(NA), CELO-GLASS SPECIFICATION PLY(NA)
CHANNEL VENT GB(D3672-81 TYPE II)
VAPORBAR BASE SHEET(D2626-81)
TARRED FELT(D227-82)
VENTED VAPORBAR BASE SHEET(D2626-81)
NO. 15 ASPHALT FELT(D226-82 TYPE I)

9. SPECIFICATION NUMBER	80-GA-1-W	80-GA-1-C	80-GA-2-W	80-GA-2-C	140-W	140-C	340-W	340-C	84-GP-1-W	84-GP-1-C	83-SP-1-W	83-SP-1-C
10. HOT APPLIED/COLD APPLIED (HOT/COLD)	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
11. DECK TYPE: A. NAILABLE	X		X		X		X		X		X	
B. INSULATED		X		X		X		X		X		X
C. NON-NAILABLE		X		X		X		X		X		X
12. SLOPE REQUIREMENT(S): A. 0"-½"	X	X	X	X	X	X	X	X	X	X	X	X
B. ½"-3"	X	X	X	X			X	X				
C. 3"-6"			X	X								
13. PLIES: A. TOTAL PLIES	4	3	4	4	4	4	4	4	4	3	4	3
B. BASE PLY	1		1		1	1	1	1	1		1	
C. INTERPLY(S)	3	3	3	4	3	3	3	3	3	3	3	3
D. CAP SHEET												
14. TYPE OF FELTS: A. GLASS FIBER	X	X	X	X					X	X	X	X
B. ORGANIC					X	X	X	X				
C. ASBESTOS												
D. POLYESTER												
E. OTHER												
15. INTERPLY BITUMEN A. HOT ASPHALT	X	X	X	X			X	X	X	X	X	X
B. HOT COAL TAR					X	X			X	X	X	X
C. HOT ELASTOMERIC INTERPLY ADHESIVE												
D. COLD ELASTOMERIC INTERPLY ADHESIVE												
16. SURFACE A. AGGREGATE (lbs/ft²)												
A.1 GRAVEL (lbs/ft²)	4	4			4	4	4	4	4	4	4	
A.2. SLAG (lbs/ft²)	3	3			3	3	3	3	3	3	3	
A.3. CRUSHED ROCK (lbs/ft²)												
B. SMOOTH												
B.1 ASPHALT			X	X	X							
B.2 COAL TAR												
B.3 COLD EMULSION/CUT BACK			X	X								
B.4 CAP SHEET												
B.5 ALUMINUM TOP COAT												
B.6 VINYL/VINYL ACRYLIC												
B.7 OTHER												
17. APPROXIMATE wt/ft²(INCLUDING PLIES)												
A. AGGREGATE	6.0	5.8			6.3	6.7	6.1	6.3	6.0	5.8	5.8	5.7
B. SMOOTH			1.7	2.0								
C. CAP SHEET												
18. RESTRICTED REGIONS (REFER TO MFRS. LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
19. YEAR OF FIRST COMMERCIAL INSTALLATION	1980	1980	1980	1980	1962	1962	1962	1962	1983	1983	1982	1982
20. TEST RESULTS (PER NBS BSS #55)												
A. TENSILE STRENGTH (>200 lb/in @ 0°F)-MD												
-XD												
B. THERMAL EXPANSION (NOT > 40×10^{-6}/°F @ 0°F to -30°F)-MD												
-XD												
C. THERMAL BASE SHOCK (NOT < 100°F)-MD					CELOTEX DOES NOT ENDORSE BSS #55 AS A PERFORMANCE CRITERIA FOR BUR SYSTEMS. ALL LISTED SYSTEMS HAVE A MINIMUM TENSILE STRENGTH AT 0°F OF MORE THAN 200 LBS/IN.							
-XD												
21. LIMITATIONS OR RESTRICTED USE												
22. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)												
A. DURATION (YEARS)	10	10	10	10	10	10	10	10	10	10	10	10
B. RENEWABLE AFTER INSPECTION (YES/NO)												
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY	X	X	X	X	X	X	X	X	X	X	X	X
C.2 WORKMANSHIP & MAT'L												
D. MONETARY LIMITATION D.1 NONE												
D.2 ORIG. COST OF INSTALLATION												
D.3 $ PER SQUARE	60	60	60	60	60	60	60	60	60	60	60	60
E. EXCLUSION FROM COVERAGE												
E.1 DAMAGE TO OTHER BUILDING COMPONENTS												
E.2 CONSEQUENTIAL DAMAGES												

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BUILT-UP ROOFING: General Information with Test Description and Suggested Values As Specified in NBS BSS #55/1974

CERTAINTEED CORPORATION
1.REGIONAL SERVICE LOCATIONS-2
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-DISTRIBUTORS/DIRECT TO ROOFERS
5.PERFORMED ACCESS. AVAIL (YES/NO)-NO
6.LIMITATIONS/RESTRICTIONS-SEE COM'L RFG SYS MAN
7.SALES/TECH INFO-REG SALES OFFICE/REG SALES OFFICE
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
CERTAGLASS PLY SHEET(D2178-84 TYPE IV)
CERTAGLASS BASE SHEET(NONE)
CERTAGLASS VENTING BASE SHEET(D3672,TYPEII)
CERTAGLASS CAP SHEET(D3909)
CERTAGLASS SPOTMOP BASE SHEET(NONE) MO*BIT(NONE)
NO. 15 PERFORATED ASPHALT FELT(D226-82 TYPE I)
ROOFERS BASE SHEET(D2626-81)

4CG-GSW	3CG-GSW	CB-3CG-GSW	CB-2CG-GSW	VB-3CG-GSW	VB-2CG-GSW	4CG-SSW	CB-3CG-SSW	VB-3CG-SSW	3CG-MSW	CB-2CG-MSW	VB-2CG-MSW	4CG-GSI	3CG-GSI	CB-3CG-GSI	CB-2CG-GSI	4CG-SSI	3CG-SSI
HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	3	4 1	3 1	4 1	3 1	4	4 1	4 1	4 1	4 1	4 1	4	3	4 1	3 1	4	3
4	3	3	2	3	2	4	3	3	3 1	2 1	2 1	4	3	3	2	4	3
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4 3 4.5	4 3 4.5	4 3 4.5	4 3 4.5	4 3 4.5	4 3 4.5							4 3 4.5	4 3 4.5	4 3 4.5	4 3 4.5		
						X X	X X	X X	X	X	X					X X	X X
5.8	5.5	5.9	5.6	6.4	6.1	1.4	1.4	1.9	1.9	2.0	2.5					1.6	1.2
NONE 1975	NONE 1975	NONE 1978	NONE 1977	NONE 1978	NONE 1978	NONE 1975	NONE 1978	NONE 1983	NONE 1978	NONE 1978	NONE 1983	NONE 1975	NONE 1975	NONE 1978	NONE 1978	NONE 1975	NONE 1976

Per CertainTeed: 1. TENSILE STRENGTHS @ 0°F NOT LESS THAN 200 lb./in. 2. THERMAL EXPANSION COEFFICIENTS NOT MORE THAN 40 × 10^{-6}/°F 3. THERMAL SHOCK FACTORS SIGNIFICANTLY GREATER THAN 100°F

335 311	222 218	352 335	231 265	332 380	268 287	335 311	352 335	332 380	332 380	375 378	323 347	335 311	222 218	352 335	231 265	335 311	222 218
25 25	22 24	38 37	38 26	34 39	35 32	25 25	38 37	34 39	34 39	39 37	39 39	25 25	22 24	38 37	38 26	25 25	22 24
640 500	705 615	463 362	405 536	425 424	351 525	640 500	463 362	425 424	425 424	534 463	436 342	640 500	705 615	643 362	404 536	640 500	705 615
10	10 X	10	10 X	10 X	10	10	10	10 X	10	10	10	20	10	20	10	20	10 X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
75	75	75	60	75	60	75	75	75	50	50	50	125	60	125	60	125	60
X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X	X	X	X	X	X X

BUILT-UP ROOFING: General Information with Test Description and Suggested Values As Specified in NBS BSS #55/1974

CERTAINTEED CORPORATION
1.REGIONAL SERVICE LOCATIONS-2
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-DISTRIBUTORS/DIRECT TO ROOFERS
5.PERFORMED ACCESS. AVAIL (YES/NO)-NO
6.LIMITATIONS/RESTRICTIONS-SEE COM'L RFG SYS MAN
7.SALES/TECH INFO-REG SALES OFFICE/REG SALES OFFICE
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
CERTAGLASS PLY SHEET(D2178-84 TYPE IV)
CERTAGLASS BASE SHEET(NONE)
CERTAGLASS VENTING BASE SHEET(D3672,TYPEII)
CERTAGLASS CAP SHEET(D3909)
CERTAGLASS SPOTMOP BASE SHEET(NONE) MO*BIT(NONE)
NO. 15 PERFORATED ASPHALT FELT(D226-82 TYPE I)
ROOFERS BASE SHEET(D2626-81)

9. SPECIFICATION NUMBER	CB-3CG-SSI	CB-2CG-SSI	3CG-MSI	CB-2CG-MSI	VB-2CG-MSI	2CG-MSI	4CG-GSC	3CG-GSC	CB-3CG-GSC	CB-2CG-GSC	4CG-SSC	3CG-SSC	CB-3CG-SSC
10. HOT APPLIED/COLD APPLIED (HOT/COLD)	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
11. DECK TYPE: A. NAILABLE													
B. INSULATED	X	X	X	X	X	X							
C. NON-NAILABLE							X	X	X	X	X	X	X
12. SLOPE REQUIREMENT(S): A. 0"-½"	X	X	X	X	X	X	X	X	X	X	X	X	X
B. ½"-3"	X	X	X	X	X	X	X	X	X	X	X	X	X
C. 3"-6"	X	X	X	X	X	X					X	X	X
13. PLIES: A. TOTAL PLIES	4	3	4	4	4	3	4	3	4	3	4	3	4
B. BASE PLY	1	1		1	1				1	1			1
C. INTERPLY(S)	3	2	3	2	2	2	4	3	3	2	4	3	3
D. CAP SHEET			1	1	1	1							
14. TYPE OF FELTS: A. GLASS FIBER	X	X	X	X	X	X	X	X	X	X	X	X	X
B. ORGANIC													
C. ASBESTOS													
D. POLYESTER													
E. OTHER													
15. INTERPLY BITUMEN A. HOT ASPHALT	X	X	X	X	X	X	X	X	X	X	X	X	X
B. HOT COAL TAR													
C. HOT ELASTOMERIC INTERPLY ADHESIVE													
D. COLD ELASTOMERIC INTERPLY ADHESIVE													
16. SURFACE A. AGGREGATE (lbs/ft²)													
A.1 GRAVEL (lbs/ft²)							4	4	4	4			
A.2. SLAG (lbs/ft²)							3	3	3	3			
A.3. CRUSHED ROCK (lbs/ft²)													
B. SMOOTH													
B.1 ASPHALT	X	X									X	X	X
B.2 COAL TAR													
B.3 COLD EMULSION/CUT BACK	X	X									X	X	X
B.4 CAP SHEET			X	X	X	X							
B.5 ALUMINUM TOP COAT													
B.6 VINYL/VINYL ACRYLIC													
B.7 OTHER													
17. APPROXIMATE wt/ft²(INCLUDING PLIES)													
A. AGGREGATE							6.1	5.7	6.2	5.8			
B. SMOOTH	1.6	1.2									1.6	1.2	1.7
C. CAP SHEET			2.1	2.1	2.6	1.8							
18. RESTRICTED REGIONS (REFER TO MFRS. LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
19. YEAR OF FIRST COMMERCIAL INSTALLATION	1978	1979	1978	1979	1979	1978	1975	1975	1983	1983	1975	1976	1983
20. TEST RESULTS (PER NBS BSS #55)													
A. TENSILE STRENGTH (>200 lb/in @ 0°F)-MD	352	231	332	375	332	268	335	222	352	231	335	222	352
-XD	335	265	380	378	347	287	311	218	311	265	311	218	335
B. THERMAL EXPANSION (NOT > 40×10^{-6}/°F @ 0°F to -30°F)-MD	38	38	34	39	39	35	25	22	38	38	25	22	38
-XD	37	26	39	37	39	32	25	24	37	26	25	24	37
C. THERMAL BASE SHOCK (NOT < 100°F)-MD	463	404	425	534	436	351	640	705	463	404	640	705	463
-XD	362	536	424	463	334	525	500	615	362	536	500	615	362
21. LIMITATIONS OR RESTRICTED USE													
22. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)													
A. DURATION (YEARS)	20	10	10	10	10	10	10	10	10	10	10	10	10
B. RENEWABLE AFTER INSPECTION (YES/NO)		X				X		X		X	X	X	
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY													
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE													
D.2 ORIG. COST OF INSTALLATION													
D.3 $ PER SQUARE	125	60	50	50	50	50	75	60	75	60	75	60	75
E. EXCLUSION FROM COVERAGE													
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X	X	X	X	X

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FLEX-SHIELD CORP.
1.REGIONAL SERVICE LOCATIONS-
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-DISTRIBUTORS
5.PREFORMED ACCESS. AVAIL (YES/NO)-
6.LIMITATIONS/RESTRICTIONS-SEE F.S. REPRESENTATIVE
7.SALES/TECH INFO-OFFICE/CHARLES CARROLL
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
RUFON(NONE)

GAF CORPORATION
1.REGIONAL SERVICE LOCATIONS-14
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-DISTRIBUTORS, DIRECT
5.PREFORMED ACCESS. AVAIL (YES/NO)-YES
6.LIMITATIONS/RESTRICTIONS-SEE GAF GAFGLAS CATALOG
7.SALES/TECH INFO-DISTRICT OFFICE/DISTRICT OFFICE
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
GAFGLAS PLY 4(D2178 TYPE IV),GAFGLAS PLY 3
(D2178 TYPE III),GAFGLAS MINERAL SURFACED CAP
SHEET(D3909),GAFGLAS#75 BASE SHEET(NO ASTM STD,
MEETS FS SS-R-6208 TYPE III,GAFGLAS BASE&PLY SHEET
(NO ASTM STANDARD,MEETS FS SS-4-6208 TYPE III),
GAFGLAS STRATAVENT (VENT PLY) PERFORATED(D3672),
GAFGLAS STRATAVENT(VENT PLY)FOR NAILABLE DECKS

CB-2CG-SSC	3CG-MSC	CB-2CG-MSC	2CG-MSC	F.A.R. MARK I	105 G	105 S	104 G	104 S-B	103 G	103 G-B	103 S
HOT	HOT	HOT	HOT	COLD	HOT	HOT	HOT	HOT	HOT	HOT	HOT
				X	X	X	X	X	X	X	X
				X	X	X	X	X	X	X	X
X	X	X	X	X							
X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X		X		X			X
3	4	4	3	2	4	4	4	4	3	3	3
1		1					1	1		1	
2	3	2	2		4	4	3	3	3	2	3
	1	1	1								
X	X	X	X		X	X	X	X	X	X	X
				X	X						
				X							
X	X	X	X		X	X	X	X	X	X	X
					X						
				X	4		4		4	4	
					3		3		3	3	
					4.5		4.5		4.5	4.5	
X						X		X			X
X				X							
	X	X	X								
				.5	6	2	6	2	6	6	2
1.3				.5							
	2.1	2.2	1.8								
NONE	NONE	NONE	NONE	1978	NONE	NONE	NONE	NONE	NONE	N	N
1983	1978	1983	1978		1974	1974	1974	1974	1974	1974	1974
231	332	375	268								
256	380	387	287								
38	34	39	35								
26	39	37	32								
404	425	534	351								
536	424	463	525								
				5							
10	10	10	10	X	10	10	5				
X	X		X				5				
X	X	X	X	X	X	X	X				
				X							
60	50	50	50	X	10	20	25				
				X							
X	X	X	X		X	X	X				
X	X	X	X		X	X	X				

All three types of warranty are available for all specifications.

BUILT-UP ROOFING: General Information with Test Description and Suggested Values As Specified in NBS BSS #55/1974

GAF CORPORATION
1.REGIONAL SERVICE LOCATIONS-14
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-DISTRIBUTORS, DIRECT
5.PREFORMED ACCESS. AVAIL (YES/NO)-YES
6.LIMITATIONS/RESTRICTIONS-SEE GAF GAFGLAS CATALOG
7.SALES/TECH INFO-DISTRICT OFFICE/DISTRICT OFFICE
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
GAFGLAS PLY 4(D2178 TYPE IV),GAFGLAS PLY 3
(D2178 TYPE III),GAFGLAS MINERAL SURFACED CAP
SHEET(D3909),GAFGLAS#75 BASE SHEET(NO ASTM STD,
MEETS FS SS-R-6208 TYPE III,GAFGLAS BASE&PLY SHEET
(NO ASTM STANDARD,MEETS FS SS-4-6208 TYPE III),
GAFGLAS STRATAVENT (VENT PLY) PERFORATED(D3672),
GAFGLAS STRATAVENT(VENT PLY)FOR NAILABLE DECKS

9. SPECIFICATION NUMBER	103 S-B	103 M	103 M-B	102 M	106 G	104 GN	104 SN	103 GN	103 SN	103 MN	101 MN	106 GN
10. HOT APPLIED/COLD APPLIED (HOT/COLD)	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
11. DECK TYPE: A. NAILABLE						X	X	X	X	X	X	X
B. INSULATED	X	X	X	X	X							
C. NON-NAILABLE	X	X	X	X	X							
12. SLOPE REQUIREMENT(S): A. 0"-½"	X	X	X	X	X	X	X	X	X	X	X	X
B. ½"-3"	X	X	X	X	X	X	X	X	X	X	X	
C. 3"-6"	X	X	X	X			X		X	X	X	
13. PLIES: A. TOTAL PLIES	3	4	4	3	3	4	4	3	3	4	3	3
B. BASE PLY	1		1			1	1	1	1	1	1	1
C. INTERPLY(S)	2	3	2	2	3	3	3	2	2	2	1	2
D. CAP SHEET		1	1	1						1	1	
14. TYPE OF FELTS: A. GLASS FIBER	X	X	X	X	X	X	X	X	X	X	X	X
B. ORGANIC												
C. ASBESTOS												
D. POLYESTER												
E. OTHER												
15. INTERPLY BITUMEN A. HOT ASPHALT	X	X	X	X		X	X	X	X	X	X	
B. HOT COAL TAR					X							X
C. HOT ELASTOMERIC INTERPLY ADHESIVE												
D. COLD ELASTOMERIC INTERPLY ADHESIVE												
16. SURFACE A. AGGREGATE (lbs/ft²)												
A.1 GRAVEL (lbs/ft²)					4	4		4				4
A.2. SLAG (lbs/ft²)					3	3		3				3
A.3. CRUSHED ROCK (lbs/ft²)					4.5	4.5		4.5				
B. SMOOTH												
B.1 ASPHALT	X						X		X			
B.2 COAL TAR												
B.3 COLD EMULSION/CUT BACK		X	X	X						X	X	
B.4 CAP SHEET												
B.5 ALUMINUM TOP COAT												
B.6 VINYL/VINYL ACRYLIC												
B.7 OTHER												
17. APPROXIMATE wt/ft²(INCLUDING PLIES)												
A. AGGREGATE					6	6		6				6
B. SMOOTH	2						2		2			
C. CAP SHEET		3	3	2						3	2	
18. RESTRICTED REGIONS (REFER TO MFRS. LITERATURE)	N	N	N	N&S	NONE	NONE	NONE	NONE	N	N	N&S	NONE
19. YEAR OF FIRST COMMERCIAL INSTALLATION	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974
20. TEST RESULTS (PER NBS BSS #55)												
A. TENSILE STRENGTH (>200 lb/in @ 0°F)-MD												
-XD												
B. THERMAL EXPANSION (NOT > 40×10^{-6}/°F @ 0°F to -30°F)-MD												
-XD												
C. THERMAL BASE SHOCK (NOT < 100°F)-MD												
-XD												
21. LIMITATIONS OR RESTRICTED USE												
22. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)												
A. DURATION (YEARS)												
B. RENEWABLE AFTER INSPECTION (YES/NO)												
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY												
C.2 WORKMANSHIP & MAT'L												
D. MONETARY LIMITATION D.1 NONE												
D.2 ORIG. COST OF INSTALLATION												
D.3 $ PER SQUARE												
E. EXCLUSION FROM COVERAGE												
E.1 DAMAGE TO OTHER BUILDING COMPONENTS												
E.2 CONSEQUENTIAL DAMAGES												

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BUILT-UP ROOFING: General Information with Test Description and Suggested Values As Specified in NBS BSS #55/1974

GENSTAR ROOFING PRODUCTS
1.REGIONAL SERVICE LOCATIONS-
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-DIRECT
5.PREFORMED ACCESS. AVAIL (YES/NO)-NO
6.LIMITATIONS/RESTRICTIONS-SEE COM'L RFG SYS MANUAL
7.SALES/TECH INFO-D.HUGHES & D.O'LEARY
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
ALL WEATHER FLAXINE BASE SHEET(D2626-80)
EMPIRE BASE SHEET(D3158-78)
FLINTGLAS BASE SHEET(NONE)
FLINTGLAS PLY SHEET(D2178-81A)
FLINTGLAS CAP SHEET(D3909-81)
NO. 15 SATURATED FELT(D226-76)
NO. 90 YOSEMITE MS BUFFER SHEET(D228-69)

AAA1-1	AAA2-1	AAA3-1	AAA4-1	AAA5-1	AAA6-1	A-1-M-1	A-2-M-1	A-3-M-1	A-4-M-1	MC-3R-1	MW-3R-1
HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
	X		X		X		X		X		X
X	X	X	X	X	X	X	X	X	X	X	X
X		X		X		X		X		X	
X	X	X	X	X	X	X	X	X	X	X	X
3	3	3	3	4	4	4	4	4	4	3	3
3	3	3	3	1	1	1	1	1	1	1	1
				3	3	2	2	2	2	2	2
						1	1	1	1		
		X	X			X	X	X	X	X	X
X	X			X	X	X	X			X	X
X	X	X	X	X	X	X	X	X	X	X	X
4	4	4	4	4	4						
						X	X	X	X	X	X
6	6	6	6	6	6					2	2
						2	2	2	2		
NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	1	1
20	20	20	20	20	20	20	20	20	20	20	20
X	X	X	X	X	X	X	X	X	X	X	X
50	50	50	50	50	50	50	50	50	50	50	50
X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X

"Genstar is currently "in test" under BSS #55 and other criteria"

KOPPERS COMPANY, INC.
1.REGIONAL SERVICE LOCATIONS-6
2.LIC. APPLICATOR AGREEMENT (YES/NO)-NO
3.APPLICATOR TRAINING-FIELD, SEMINARS
4.DISTRIB'N METHOD-DIRECT & DISTRIBUTOR
5.PREFORMED ACCESS. AVAIL (YES/NO)-NO
6.LIMITATIONS/RESTRICTIONS-1/2"/FT MAX. SLOPE
7.SALES/TECH INFO-REGIONAL SALES OFFICE
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
NO. 15 TARRED FELT(D227)

220	210
HOT	HOT
	X
X	
X	
X	X
4	4
	1
4	3
X	X
X	X
4	4
6	6
NONE 1928	NONE 1928
468 265	
19.3 29.5	
360 120	
X	X

This data was derived from an NBS test of a 4 ply coal tar BUR system and presented in their report Preliminary Performance Criteria for Bituminous Membrane Roofing BSS #55.

These roofing systems, when applied in strict accordance with Koppers specifications and subject to their evaluation can be guaranteed for periods up to 20 yrs — see "IMPORTANT NOTES" in this Guide.

BUILT-UP ROOFING: General Information with Test Description and Suggested Values As Specified in NBS BSS #55/1974

LUNDAY THAGARD CO., INC.
1.REGIONAL SERVICE LOCATIONS-
2.LIC. APPLICATOR AGREEMENT (YES/NO)-NO
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-DISTRIBUTORS/DIRECT TO ROOFERS
5.PREFORMED ACCESS. AVAIL (YES/NO)-NO
6.LIMITATIONS/RESTRICTIONS-SEE L T BUR MANUAL
7.SALES/TECH INFO-OFFICE/GEORGE THAGARD III
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
TYPE 15 PERF(D226-81 TYPE I)
TYPE 30(D226-81 TYPE II)
MULTI SEAL(D2626-81 TYPE I)
MULTI GLASS BASE 35(NONE)
TYPE 75 CAP(D3909-80)
TYPE 90 CAP(D249-80)
PLY II-4(D2178-81 TYPE IV)

9. SPECIFICATION NUMBER	LT 1-W	LT 1-C	LT2-W	LT2-C	LT3-W	LT3-C	LT4-W	LT4-C	LT5-W	LT5-C	LT6-W	LT6-C	LT7-W
10. HOT APPLIED/COLD APPLIED (HOT/COLD)	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
11. DECK TYPE: A. NAILABLE	X		X		X		X		X		X		X
B. INSULATED													
C. NON-NAILABLE		X		X		X		X		X			
12. SLOPE REQUIREMENT(S): A. 0"-½"													
B. ½"-3"	X	X	X	X	X	X	X	X	X	X	X	X	X
C. 3"-6"													
13. PLIES: A. TOTAL PLIES	3	3	4	4	3	3	5	5	4	4	3	3	3
B. BASE PLY					1	1			1	1	3	3	1
C. INTERPLY(S)	3	3	4	4	2	2	5	5	3	3			2
D. CAP SHEET													
14. TYPE OF FELTS: A. GLASS FIBER													X
B. ORGANIC	X	X	X	X	X	X	X	X	X	X	X	X	
C. ASBESTOS													
D. POLYESTER													
E. OTHER													
15. INTERPLY BITUMEN A. HOT ASPHALT	X	X	X	X	X	X	X	X	X	X	X	X	X
B. HOT COAL TAR													
C. HOT ELASTOMERIC INTERPLY ADHESIVE													
D. COLD ELASTOMERIC INTERPLY ADHESIVE													
16. SURFACE A. AGGREGATE (lbs/ft²)													
A.1 GRAVEL (lbs/ft²)	4	4	4	4	4	4	4	4	4	4	4	4	4
A.2. SLAG (lbs/ft²)													
A.3. CRUSHED ROCK (lbs/ft²)													
B. SMOOTH													
B.1 ASPHALT													
B.2 COAL TAR													
B.3 COLD EMULSION/CUT BACK													
B.4 CAP SHEET													
B.5 ALUMINUM TOP COAT													
B.6 VINYL/VINYL ACRYLIC													
B.7 OTHER													
17. APPROXIMATE w/ft²(INCLUDING PLIES)													
A. AGGREGATE	5.5	5.7	6.0	6.2	5.8	6.0	6.4	6.6	6.2	6.4	6.3	6.5	5.6
B. SMOOTH													
C. CAP SHEET													
18. RESTRICTED REGIONS (REFER TO MFRS. LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
19. YEAR OF FIRST COMMERCIAL INSTALLATION													
20. TEST RESULTS (PER NBS BSS #55)													
A. TENSILE STRENGTH (> 200 lb/in @ 0°F)-MD													
-XD													
B. THERMAL EXPANSION (NOT > 40×10^{-6}/°F @ 0°F to -30°F)-MD													
-XD													
C. THERMAL BASE SHOCK (NOT < 100°F)-MD													
-XD													
21. LIMITATIONS OR RESTRICTED USE													
22. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)													
A. DURATION (YEARS)	10	10	20	20	15	15	20	20	20	20	20	20	20
B. RENEWABLE AFTER INSPECTION (YES/NO)													
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY	X	X	X	X	X	X	X	X	X	X	X	X	X
C.2 WORKMANSHIP & MAT'L													
D. MONETARY LIMITATION D.1 NONE													
D.2 ORIG. COST OF INSTALLATION													
D.3 $ PER SQUARE	X	X	X	X	X	X	X	X	X	X	X	X	X
E. EXCLUSION FROM COVERAGE													
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X	X	X	X	X

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LT7-C	LT8-W	LT8-C	LT9-W	LT9-C	LT10-W	LT11-W	LT12-W	LT12-C	LT13-W	LT13-C	LT14-W	LT14-C	LT15-W	LT15-C	LT16-W
HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
	X		X		X	X	X		X		X		X		X
		X		X				X		X		X		X	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	4	4	3	3	3	4	3	3	3	3	4	4	3	3	3
1	1	1	3	3			2	2	1	1	1	1	2	2	
2	3	3			2	3			1	1	2	2			2
					1	1	1	1	1	1	1	1	1	1	1
X	X	X	X	X			X	X	X	X	X	X	X	X	X
					X	X	X	X							X
X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	4	4	4	4											
5.9	6.0	6.3	6.2	6.4											
					1.7	2.1	2.1	2.3	1.7	1.9	2.1	2.3	2.0	2.2	1.6
NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
20	20	20	20	20	10	15	20	20	20	20	20	20	20	20	15
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

BUILT-UP ROOFING: General Information with Test Description and Suggested Values As Specified in NBS BSS #55/1974

MALARKEY ROOFING CO.
1.REGIONAL SERVICE LOCATIONS-
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-DISTRIBUTORS
5.PREFORMED ACCESS. AVAIL (YES/NO)-NO
6.LIMITATIONS/RESTRICTIONS-SEE MALARKEY BUR MANUAL
7.SALES/TECH INFO-J CLENAGHEN/K WOODSIDE
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
APPLICATORS PLY(D2178-81A TYPE III)
PREMIUM I PLY(D2178-81-A TYPE IV)
PREMIUM CAP(D3909-81)
PREMIUM I BASE(NONE)
HI PERFORMANCE CAP(NONE)

9. SPECIFICATION NUMBER	IG4	NG4	IG3	NG3	UG4	IM4	NM4	IM3	NM3	UM4	IS4	NS4	NS3
10. HOT APPLIED/COLD APPLIED (HOT/COLD)	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
11. DECK TYPE: A. NAILABLE		X		X			X		X			X	X
B. INSULATED	X		X		X	X		X		X	X		
C. NON-NAILABLE	X		X			X		X					
12. SLOPE REQUIREMENT(S): A. 0"-½"	X	X	X	X	X	X	X	X	X	X	X	X	X
B. ½"-3"	X	X	X	X	X	X	X	X	X	X	X	X	X
C. 3"-6"						X	X	X	X	X	X	X	X
13. PLIES: A. TOTAL PLIES	4	4	3	3	4	4	4	3	3	4	4	4	3
B. BASE PLY		1		1	1		1		1	1		1	1
C. INTERPLY(S)	4	3	3	2	3	3	2	2	1	2	4	3	2
D. CAP SHEET						1	1	1	1	1			
14. TYPE OF FELTS: A. GLASS FIBER	X	X	X	X	X	X	X	X	X	X	X	X	X
B. ORGANIC													
C. ASBESTOS													
D. POLYESTER													
E. OTHER													
15. INTERPLY BITUMEN A. HOT ASPHALT	X	X	X	X	X	X	X	X	X	X	X	X	X
B. HOT COAL TAR													
C. HOT ELASTOMERIC INTERPLY ADHESIVE													
D. COLD ELASTOMERIC INTERPLY ADHESIVE													
16. SURFACE A. AGGREGATE (lbs/ft²)													
A.1 GRAVEL (lbs/ft²)	4	4	4	4	4								
A.2. SLAG (lbs/ft²)													
A.3. CRUSHED ROCK (lbs/ft²)													
B. SMOOTH													
B.1 ASPHALT											X	X	X
B.2 COAL TAR													X
B.3 COLD EMULSION/CUT BACK											X	X	X
B.4 CAP SHEET						X	X	X	X	X			
B.5 ALUMINUM TOP COAT													
B.6 VINYL/VINYL ACRYLIC													
B.7 OTHER													
17. APPROXIMATE wt/ft²(INCLUDING PLIES)													
A. AGGREGATE	6	6	5.5	5.5	6								
B. SMOOTH											1.7	1.6	1.3
C. CAP SHEET						2.1	2.2	1.8	1.9	2			
18. RESTRICTED REGIONS (REFER TO MFRS. LITERATURE)	NONE	NONE	2,3	2,3	NONE	NONE	NONE	3	3	NONE	NONE	NONE	2,3
19. YEAR OF FIRST COMMERCIAL INSTALLATION	1981	1981	1981	1981	1983	1981	1981	1981	1981	1983	1982	1982	1983
20. TEST RESULTS (PER NBS BSS #55)													
A. TENSILE STRENGTH (> 200 lb/in @ 0°F)-MD													
-XD													
B. THERMAL EXPANSION (NOT > 40×10⁻⁶/°F @ 0°F to -30°F)-MD													
-XD													
C. THERMAL BASE SHOCK (NOT < 100°F)-MD													
-XD													
21. LIMITATIONS OR RESTRICTED USE													
22. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)													
A. DURATION (YEARS)	10	10	5	5	10	10	10	5	5	10	10	10	5
B. RENEWABLE AFTER INSPECTION (YES/NO)	X		X	X				X	X		X		X
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY													
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE	X												
D.2 ORIG. COST OF INSTALLATION											X		
D.3 $ PER SQUARE		50	35	35	50	50	50	35	35	50		50	35
E. EXCLUSION FROM COVERAGE													
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X	X	X	X	X

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MALARKEY ROOFING CO.

MANVILLE BUILDING MATERIALS CORP.
1.REGIONAL SERVICE LOCATIONS-8
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-
5.PREFORMED ACCESS. AVAIL (YES/NO)-YES
6.LIMITATIONS/RESTRICTIONS-
7.SALES/TECH INFO-DAVE WILLS/V. GRACO
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
GLASPLY(D2178-81A),GLASFELT IV(D2178-81A)
GLASBASE(NONE)
PLANET II(NONE)
GLASKAP(D3909-81)
VENTSULATION(D3672-81)
CENTURION(D250-81 TYPE IV)

US4	GF-4GIS	GF-4GNS	GF-3GIS	GF-3GNS	GF-4GIG	GF-3GIG	GF-4GNG	GF-3GNG	GF-4GLG	GF-3GLG	GF-4GIC	GF-4GNC	GF-3GIC	GF-3GNC	3GNC	4GIS	4GNS
HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
		X		X			X	X	X	X		X		X	X		X
X	X		X		X	X					X		X			X	
	X		X		X	X					X		X				
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
X	X	X	X	X							X	X	X	X		X	X
4	4	4	3	3	4	3	4	3	4	3	4	4	3	3	3	4	4
1				1			1	1	1	1		1			1		1
3	4	4	3	2	4	3	3	2	3	2	3	2	2	2	1	4	3
											1	1	1	1	1		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
					4	4	4	4	4	4							
X	X	X	X	X												X	X
X	X	X	X	X							X	X	X	X	X		
1.6	1.6	1.3	1.1	1	5	4.5	4.6	4.5	4.6	4.5	2	2	1.8	1.7	1.7	1.7	1.0
NONE				2,3				2&3		2&3			3	3	3		
1983	1983	1983	1983	1983	1983	1983	1983	1983	1983	1983	1983	1983	1983	1983	1980	1976	1978
																404	357
																351	343
10	10	10	10	10	10	10	10	10	5	5	10	10	10	10	10	20	20
X																	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
																X	X
50	75	60	50	50	75	50	60	50	35	35	75	60	50	50	75		
X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
X																	

"Manville does not endorse BSS #55 as a proven performance criteria for Built-Up Roofing Systems. Manville Research Engineers are currently working to establish a performance criteria for Built-Up Roofing which can realistically be used to predict actual performance expectations."

BUILT-UP ROOFING: General Information with Test Description and Suggested Values As Specified in NBS BSS #55/1974

MANVILLE BUILDING MATERIALS CORP.
1.REGIONAL SERVICE LOCATIONS-8
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-
5.PREFORMED ACCESS. AVAIL (YES/NO)-YES
6.LIMITATIONS/RESTRICTIONS-
7.SALES/TECH INFO-DAVE WILLS/V. GRACO
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
GLASPLY(D2178-81A),GLASFELT IV(D2178-81A)
GLASBASE(NONE)
PLANET II(NONE)
GLASKAP(D3909-81)
VENTSULATION(D3672-81)
CENTURION(D250-81 TYPE IV)

9. SPECIFICATION NUMBER	3GIS	3GNS	4GIG	3GIG	4GNG	3GNG	4GLG	3GLG	4GIC	4GNC	3GIC
10. HOT APPLIED/COLD APPLIED (HOT/COLD)	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
11. DECK TYPE: A. NAILABLE		X			X	X	X	X		X	
B. INSULATED	X		X	X					X		X
C. NON-NAILABLE											
12. SLOPE REQUIREMENT(S): A. 0"-½"	X	X	X	X	X	X	X	X			
B. ½"-3"	X	X	X	X	X	X	X	X	X	X	
C. 3"-6"	X	X								X	
13. PLIES: A. TOTAL PLIES	3	3	4	3	4	3	4	3	4	4	3
B. BASE PLY		1			1	1	1	1		1	
C. INTERPLY(S)	3	2	4	3	3	2	3	2	3	2	2
D. CAP SHEET									1	1	1
14. TYPE OF FELTS: A. GLASS FIBER	X	X	X	X	X	X	X	X	X	X	X
B. ORGANIC											
C. ASBESTOS											
D. POLYESTER											
E. OTHER											
15. INTERPLY BITUMEN A. HOT ASPHALT	X	X	X	X	X	X	X	X	X	X	X
B. HOT COAL TAR											
C. HOT ELASTOMERIC INTERPLY ADHESIVE											
D. COLD ELASTOMERIC INTERPLY ADHESIVE											
16. SURFACE A. AGGREGATE (lbs/ft²)											
A.1 GRAVEL (lbs/ft²)			4	4	4	4	4	4			
A.2. SLAG (lbs/ft²)											
A.3. CRUSHED ROCK (lbs/ft²)											
B. SMOOTH											
B.1 ASPHALT	X	X									
B.2 COAL TAR											
B.3 COLD EMULSION/CUT BACK											
B.4 CAP SHEET									X	X	X
B.5 ALUMINUM TOP COAT											
B.6 VINYL/VINYL ACRYLIC											
B.7 OTHER											
17. APPROXIMATE wt/ft²(INCLUDING PLIES)											
A. AGGREGATE			6	5.5	5.5	5	6	5.5			
B. SMOOTH	1.4	1.2									
C. CAP SHEET									2.2	2.1	1.9
18. RESTRICTED REGIONS (REFER TO MFRS. LITERATURE)		2,3				2,3	2,3	2,3			3
19. YEAR OF FIRST COMMERCIAL INSTALLATION	1980	1980	1978	1978	1978	1980	1980	1980	1978	1978	1978
20. TEST RESULTS (PER NBS BSS #55)											
A. TENSILE STRENGTH (>200 lb/in @ 0°F)-MD	310	288	404	310	357	288					
-XD	331	247	351	331	343	247					
B. THERMAL EXPANSION (NOT > 40 × 10⁻⁶/°F @ 0°F to -30°F)-MD											
-XD											
C. THERMAL BASE SHOCK (NOT < 100°F)-MD											
-XD											
21. LIMITATIONS OR RESTRICTED USE											
22. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)											
A. DURATION (YEARS)	10	10	20	10	20	10	10	5	20	20	5
B. RENEWABLE AFTER INSPECTION (YES/NO)											
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY											
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE	X		X	X	X				X	X	
D.2 ORIG. COST OF INSTALLATION											
D.3 $ PER SQUARE		75				75	75	35			35
E. EXCLUSION FROM COVERAGE											
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES											

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MINERAL FIBER MFG. CORP
1.REGIONAL SERVICE LOCATIONS-
2.LIC. APPLICATOR AGREEMENT (YES/NO)-
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-MANUFACTURERS/REPS.
5.PREFORMED ACCESS. AVAIL (YES/NO)-NO
6.LIMITATIONS/RESTRICTIONS-
7.SALES/TECH INFO-ROBERT S. SIMPSON/DAVE BROWN
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
DURAPLY IV(D2178-81 TYPE IV)
DURABASE (NONE)
POLYPLY(NONE)

OWENS-CORNING FIBERGLAS
1.REGIONAL SERVICE LOCATIONS-NATIONWIDE
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD, SEMINARS
4.DISTRIB'N METHOD-DISTRIBUTORS/DIRECT TO ROOFERS
5.PREFORMED ACCESS. AVAIL (YES/NO)-YES
6.LIMITATIONS/RESTRICTIONS-SEE OCF BUR MANUAL
7.SALES/TECH INFO-LOCAL OFFICE/LOCAL OFFICE
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
PERMA PLY-R(D2178-81A-TYPE IV, TABLE 1)
PERMA PLY NO. 28(NONE)
PERMA CAP(3909-81)
PERMA PLY IV(D2178-81A-TYPE IV, TABLE 1)

43-GAW	43-GSW	43-GAC	44-GSC	52-PAW	52-PSW	52-PSC	52-PAC	23-TG	23-TC	33-TS	33-FG	33-FC	43-FS	33-IS	43-NG	3P-IG	4P-IG
HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
X	X			X	X										X		
		X	X			X	X	X	X	X	X	X	X	X		X	X
		X	X			X	X										
								X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
	X		X						X	X		X	X	X			
4	4	3	4	3	3	2	2	2	3	3	3	4	4	3	4	3	4
1	1			1							1	1	1		1		
3	3	3	4	2	2	2	2	2	2	3	2	2	3	3	3	3	4
									1								
X	X	X	X					X	X	X	X	X	X	X	X	X	X
				X	X	X	X										
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
																X	X
4		4		4			4	4			4				4	4	4
	X		X							X			X	X			
	X		X		X	X			X	X		X	X	X			
6	2	6	2	5	2	2	6	5.5		1.5	5.5		1.5	1.5	6	6	6.5
									2			2					
								1	1	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
1976	1976	1976	1976	1982	1982	1982	1982	1965	1965	1965	1965	1965	1965	1965	1965	1973	1973
								166	166	226	226	226	264	238	283	216	316
								198	198	224	224	224	356	321	320	263	442
								23.3	23.3	17.4	17.4	17.4	19.9	19.7	19.1	17.4	20.4
								24.0	24.0	13.6	13.6	13.6	17.5	12.9	25.2	13.2	14.4
								663	663	663	928	928	685	661	670	754	652
								645	645	645	1332	1332	1038	1294	616	959	705
								10	10	10	10	10	10	10	10	10	20
								X	X	X	X	X	X	X	X	X	X
								X	X	X	X	X	X	X	X	X	X
								X	X	X	X	X	X	X	X	X	X
								X	X	X	X	X	X	X	X	X	X

OWENS-CORNING FIBERGLAS
1.REGIONAL SERVICE LOCATIONS-NATIONWIDE
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD, SEMINARS
4.DISTRIB'N METHOD-DISTRIBUTORS/DIRECT TO ROOFERS
5.PREFORMED ACCESS. AVAIL (YES/NO)-YES
6.LIMITATIONS/RESTRICTIONS-SEE OCF BUR MANUAL
7.SALES/TECH INFO-LOCAL OFFICE/LOCAL OFFICE
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
PERMA PLY-R(D2178-81A-TYPE IV, TABLE 1)
PERMA PLY NO. 28(NONE)
PERMA CAP(3909-81)
PERMA PLY IV(D2178-81A-TYPE IV, TABLE 1)

9. SPECIFICATION NUMBER	3P-NG	3P-XG	33-IG	43-IG	33-IC	43-IC	43-IS	33-XG	33-XC	43-XS	33-NG	33-NC	43-NS
10. HOT APPLIED/COLD APPLIED (HOT/COLD)	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
11. DECK TYPE: A. NAILABLE	X												
B. INSULATED			X	X	X	X	X				X	X	X
C. NON-NAILABLE		X						X	X	X			
12. SLOPE REQUIREMENT(S): A. 0"-½"	X	X	X	X	X	X	X	X	X	X	X	X	X
B. ½"-3"			X	X	X	X	X	X	X	X	X	X	X
C. 3"-6"					X	X	X		X	X		X	X
13. PLIES: A. TOTAL PLIES	3	3	3	4	4	5	4	3	4	4	3	4	4
B. BASE PLY		1											
C. INTERPLY(S)	3	2	3	4	3	4	4	3	3	4	3	3	4
D. CAP SHEET					1	1			1			1	
14. TYPE OF FELTS: A. GLASS FIBER	X	X	X	X	X	X	X	X	X	X	X	X	X
B. ORGANIC													
C. ASBESTOS													
D. POLYESTER													
E. OTHER													
15. INTERPLY BITUMEN A. HOT ASPHALT			X	X	X	X	X	X	X	X	X	X	X
B. HOT COAL TAR	X	X											
C. HOT ELASTOMERIC INTERPLY ADHESIVE													
D. COLD ELASTOMERIC INTERPLY ADHESIVE													
16. SURFACE A. AGGREGATE (lbs/ft²)													
A.1 GRAVEL (lbs/ft²)	4	4	4	4				4			4		
A.2. SLAG (lbs/ft²)													
A.3. CRUSHED ROCK (lbs/ft²)													
B. SMOOTH													
B.1 ASPHALT							X			X			X
B.2 COAL TAR													
B.3 COLD EMULSION/CUT BACK							X			X			X
B.4 CAP SHEET					X	X			X			X	
B.5 ALUMINUM TOP COAT													
B.6 VINYL/VINYL ACRYLIC													
B.7 OTHER													
17. APPROXIMATE wt/ft²(INCLUDING PLIES)													
A. AGGREGATE	5.5	6	5.5	6			1.5	5.5		1.5	5.5		1
B. SMOOTH					2	2.4			2			2	
C. CAP SHEET													
18. RESTRICTED REGIONS (REFER TO MFRS. LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
19. YEAR OF FIRST COMMERCIAL INSTALLATION	1965	1973	1965	1965	1965	1965	1965	1965	1965	1965	1965	1965	1965
20. TEST RESULTS (PER NBS BSS #55)													
A. TENSILE STRENGTH (>200 lb/in @ 0°F)-MD		216	238	337	238	337	337	238	238	337	238	238	337
-XD		263	321	431	321	431	431	321	321	431	321	321	431
B. THERMAL EXPANSION (NOT > 40×10⁻⁶/°F @ 0°F to -30°F)-MD		17.4	19.7	19.0	19.7	19.0	19.0	19.7	19.7	19.0	19.7	19.7	19.0
-XD		13.2	12.9	15.2	12.9	15.2	15.2	12.9	12.9	15.2	12.9	12.9	15.2
C. THERMAL BASE SHOCK (NOT < 100°F)-MD		754	661	725	661	725	725	661	661	725	661	661	725
-XD		959	1294	1174	1294	1174	1174	1294	1294	1174	1294	1294	1174
21. LIMITATIONS OR RESTRICTED USE													
22. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)													
A. DURATION (YEARS)	10	10	10	20	10	20	20	10	10	10	10	10	10
B. RENEWABLE AFTER INSPECTION (YES/NO)													
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY													
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE	X	X	X	X	X	X	X	X	X	X	X	X	X
D.2 ORIG. COST OF INSTALLATION													
D.3 $ PER SQUARE													
E. EXCLUSION FROM COVERAGE													
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X	X	X	X	X

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31-IG	31-IC	31-IS	21-TG	21-TC	31-TS	31-XG	31-XC	41-XS	31-NG	31-NC	41-NS	41-IS	31-FG	31-FC	41-FS	41-NG
HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X X	X X X	X X X	X X	X X X	X X X	X X	X X X	X X X	X X	X X X	X X X	X X X	X X	X X X	X X X	X X
3 3	4 3 1	3 3	2 2	3 2 1	3 3	3 3	4 3 1	4 4	3 1 2	4 1 2 1	4 1 3	3 3	3 1 2	4 1 2 1	4 1 3	4 1 3
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4			4			4			4				4			4
	X	X X		X	X X		X	X X		X	X X	X X		X	X X	
5.5	2	1.5	5.5	2	1.5	5.5	2	1.5	5.5	2	1.5	1.5	5.5	2	1.5	6
NONE 1983	NONE 1983	NONE 1983	1 1983	1 1983	NONE 1983	NONE 1983	NONE 1983	NONE 1983	NONE 1983	NONE 1983	NONE 1983	NONE 1983	NONE 1983	NONE 1983	NONE 1983	NONE 1983
10 X	10 X	10 X	10 X	10 X	10 X	10 X	10 X	10 X	10 X	10 X	10 X	10 X	10 X	10 X	10 X	10 X
50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X	50 X X

BUILT-UP ROOFING: General Information with Test Description and Suggested Values As Specified in NBS BSS #55/1974

TAMKO ASPHALT PRODUCTS, INC
1.REGIONAL SERVICE LOCATIONS-10
2.LIC. APPLICATOR AGREEMENT (YES/NO)-YES
3.APPLICATOR TRAINING-FIELD, SEMINARS
4.DISTRIB'N METHOD-DISTRIBUTORS
5.PREFORMED ACCESS. AVAIL (YES/NO)-NO
6.LIMITATIONS/RESTRICTIONS-SEE TAMKO
7.SALES/TECH INFO-PHIL DANIELS/W. KENT BLANCHARD
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
TRI-SIX(D226-82 TYPE III)
TYPE 15 PERF(D226-82 TYPE I)
TYPE 30 PERF(D226-82 TYPE II)
TYPE 43 BASE(D2626-81), TAM-GLASS(D2178-82A)
TAM CAP(3909-81)
VAPOR CHAN(D3672-81 TYPE II)
GLASS-BASE(NONE), VENT-PLY(NONE)

9. SPECIFICATION NUMBER	301	401	403	412	501	502	503	504	505	506	512	514	515
10. HOT APPLIED/COLD APPLIED (HOT/COLD)	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT	HOT
11. DECK TYPE: A. NAILABLE				X									
B. INSULATED	X	X	X		X	X	X	X	X	X	X	X	X
C. NON-NAILABLE													
12. SLOPE REQUIREMENT(S): A. 0"-½"	X	X	X	X	X	X	X	X	X	X	X	X	X
B. ½"-3"	X	X	X	X	X		X			X		X	X
C. 3"-6"													
13. PLIES: A. TOTAL PLIES	3	4	4	4	3	4	4	3	4	4	4	4	4
B. BASE PLY		1		1						1	1	1	1
C. INTERPLY(S)	3	3	4	3	3	3	4	3	4	3	2	3	3
D. CAP SHEET						1					1		
14. TYPE OF FELTS: A. GLASS FIBER					X	X	X	X	X	X	X	X	X
B. ORGANIC	X	X	X	X									
C. ASBESTOS													
D. POLYESTER													
E. OTHER													
15. INTERPLY BITUMEN A. HOT ASPHALT	X	X	X	X	X	X	X	X	X	X	X	X	X
B. HOT COAL TAR													
C. HOT ELASTOMERIC INTERPLY ADHESIVE													
D. COLD ELASTOMERIC INTERPLY ADHESIVE													
16. SURFACE A. AGGREGATE (lbs/ft²)													
A.1 GRAVEL (lbs/ft²)	4	4	4	4	4		4			4		4	4
A.2. SLAG (lbs/ft²)													
A.3. CRUSHED ROCK (lbs/ft²)													
B. SMOOTH													
B.1 ASPHALT								X	X				
B.2 COAL TAR													
B.3 COLD EMULSION/CUT BACK													
B.4 CAP SHEET						X		X	X		X		
B.5 ALUMINUM TOP COAT													
B.6 VINYL/VINYL ACRYLIC													
B.7 OTHER													
17. APPROXIMATE w/ft²(INCLUDING PLIES)													
A. AGGREGATE	6	6.5	6	6	6		6			6		6	7
B. SMOOTH								1.5	2				
C. CAP SHEET						2					2		
18. RESTRICTED REGIONS (REFER TO MFRS. LITERATURE)													
19. YEAR OF FIRST COMMERCIAL INSTALLATION								2					
20. TEST RESULTS (PER NBS BSS #55)													
A. TENSILE STRENGTH (>200 lb/in @ 0°F)-MD													
-XD													
B. THERMAL EXPANSION (NOT > 40×10^{-6}/°F @ 0°F to -30°F)-MD													
-XD													
C. THERMAL BASE SHOCK (NOT < 100°F)-MD													
-XD													
21. LIMITATIONS OR RESTRICTED USE													
22. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)													
A. DURATION (YEARS)	5&10	5&10	5&10	5&10	5&10	5&10	5&10	5&10	5&10	5&10	5&10	5&10	5&10
B. RENEWABLE AFTER INSPECTION (YES/NO)	X	X	X	X	X	X	X	X	X	X	X	X	X
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY													
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE													
D.2 ORIG. COST OF INSTALLATION													
D.3 $ PER SQUARE	X	X	X	X	X	X	X	X	X	X	X	X	X
E. EXCLUSION FROM COVERAGE													
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X	X	X	X	X

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TREMCO, INC.
1.REGIONAL SERVICE LOCATIONS-18
2.LIC. APPLICATOR AGREEMENT (YES/NO)-
3.APPLICATOR TRAINING-FIELD
4.DISTRIB'N METHOD-LOCAL SALES REPS
5.PREFORMED ACCESS. AVAIL (YES/NO)-YES
6.LIMITATIONS/RESTRICTIONS-SEE TREMCO REP
7.SALES/TECH INFO-PAUL MITCHELL/KEN BRZOZOWSKI
8.FELTS DATA:TRADE NAME (APPLICABLE ASTM STANDARD)
BURMASTIC GLASS PLY SHEET(FS SSR 620B TYPE II)
THERM 100 GLASS PLY SHEET(D2178 TYPE IV)
POLY THERM PLY SHEET(PROPRIETARY (NA))

516	521	522	BUR MASTIC	BUR MASTIC	THERM 100	THERM 100	THERM 200	THERM 200
HOT	HOT	HOT	COLD	COLD	HOT	HOT	HOT	HOT
X			X	X	X	X	X	X
			X	X	X	X	X	X
	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X
	X		X	X	X	X	X	X
			X	X	X	X	X	X
4	3	4	3	3	3	3	3	3
1								
3	3	3						
		1						
X	X	X	3	3	3	3		
							3	3
X	X	X						
					X	X	X	X
			X	X				
	4		0.6	4.0	0.6	4.0	0.6	4.0
X								
X								
		X						
			GRAN.6		GRAN.6		GRAN.6	
	6		2.3	5.7	1.8	5.2	1.6	5.0
1.5		2						
			1978	1978	1982	1982	1983	1983
			415	415	320	320	310	310
			300	300	350	350	240	240
			18.3	18.3	20	20	25	25
			36.1	36.1	35	35	25	25
			700	700	4500	4500	4500	4500
			700	700	2500	2500	2500	2500
5&10	5&10	5&10	10	10	10	10	10	10
X	X	X						
X	X	X	X	X	X	X	X	X
			X	X	X	X	X	X
X	X	X						
X	X	X						

MODIFIED BITUMENS Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	ALLROOF INTERNAT'L, INC	ALLROOF INTERNAT'L, INC	ALLROOF INTERNAT'L, INC	ALLROOF INTERNAT'L, INC	ALLROOF INTERNAT'L, INC	AMERICAN LUBRICANTS CO, THE	AMERICAN ROOFING CORP	AMERICAN ROOFING CORP	AMERICAN ROOFING CORP	APACHE BUILDING PRODUCTS CO
2. PRODUCT NAME	BELROOF SD-4	BELFROOF SD-4M	BELROOF SBS-4	BELFROOF SBS-4M	ALLROOF POLYPREN	TIFFANY	ARC ALUMINUM	ARC PREMIUM	ARC GRANULAR	SAM
3. PRODUCT DESCRIPTION: A. TYPE OF BITUMEN MODIFIER										
B. THICKNESS (MILS)	157	172	157	175	83	150	160	160	175	75
C. TOP SURFACE	MODIFIED BITUMEN	GRANULAR	MODIFIED BITUMEN	SLATE CHIP	PLAIN	MODIFIED BITUMEN	ALUMINUM	PLAIN	MINERAL	POLY-PROPYLENE
D. REINFORCEMENT MATERIAL	NONWOVEN POLYESTER	NONWOVEN POLYESTER	NONWOVEN POLYESTER	NONWOVEN POLYESTER	NONWOVEN FIBER	POLYESTER	FIBERGLASS	POLYESTER	POLYESTER	POLY-PROPYLENE
E. COLOR	BLACK	VARIOUS	BLACK	GRY,GRN,RD	BLACK	BLACK	ALUMINUM	BLACK	OPTIONAL	GREY-BLACK
F. INSTALLED WT (lbs/ft² W/O BALLAST)	.88	.99	.88	.99	.50	.88	.88	.88	.96	.40
4. COATING REQUIRED	RECOMMENDED BUT NOT REQD	NONE	SBS-4M,GRAVL ALUM,ACRYLIC	NONE	NONE	ALUMINUM RECOMMENDED	NONE	NONE	NONE	YES
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X	X	X	X
B. REROOFING	X	X	X	X	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD	TORCH	TORCH	TORCH	TORCH	HOT AIR	TORCH	TORCH	TORCH	TORCH	SELF-ADHERNG
7. TYPE OF ROOF SYSTEM: A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)			5		10 LBS					
B. PARTIALLY ADHERED (METHOD)		TORCH	H.A.OR TORCH	H.A.OR TORCH	HOT ASPHALT	X				X
C. FULLY ADHERED (METHOD)	TORCH	TORCH	H.A.OR TORCH	H.A.OR TORCH	HOT ASPHALT	X	TORCH	TORCH	TORCH	SELF-ADHERNG
D. PROTECTED MEMBRANE ROOFING ASSEMBLY								X		X
8. MINIMUM SLOPE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	POS DRAIN	DEAD LEVEL	POS DRAIN	DEAD LEVEL
9. USE OVER: A. PERLITE	X	X	X	X	X	X*	X*	X*	X*	
B. POLYURETHANE	X	X	X	X	X	X*	X*	X*	X*	X
C. WOOD FIBER	X	X	X	X	X	X*	X*	X*	X*	X*
D. GLASS FIBER	X	X	X	X	X	X*	X*	X*	X*	X
E. EXPANDED POLYSTYRENE	X	X	X	X	X		X*	X*	X*	
F. FELT FACED COMPOSITES	X	X	X	X	X	X	X*	X*	X*	X
G. OTHER	BASE SHEET OVER NON-PREFACED INSULATION	FELT BASE SHEET WHEN REQUIRED			ANY SKINNED INSULATION, WOOD,METAL, CONCRETE, PROT'N BOARD	*OVERLAYMENT REQUIRED IF NOT FELT OR ASPHALT FACED	*OVERLAYMENT REQUIRED	*OVERLAYMENT REQUIRED	*OVERLAYMENT REQUIRED	DIRECT TO CONCRETE,WD, BUR,OTHER MB METAL,EXIST BUR*PRM REQ
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE	NONE	NONE	NONE					NONE
11. WORKABLE TEMPERATURE RANGE	30 F-120 F	30 F-120 F	30 F-150 F	30 F-150 F	30 F-150 F	0 F-120 F	15 F-115 F	0 F-115 F	0 F-115 F	40 F-120 F
12. FLASHING MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL
13. FLASHING METHOD	TORCH	TORCH	H.A.OR TORCH	H.A.OR TORCH	TORCH	TORCH	TORCH	TORCH	TORCH	SELF-ADHERNG
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	NO	NONE	UNNECESSARY	UNNECESSARY	YES	NO	NO	NO	NO	NONE
15. COUNTRY: A. ORIGIN	ITALY	ITALY	BELGIUM	BELGIUM	ITALY	ITALY	ITALY	ITALY	ITALY	USA
B. MANUFACTURE	USA	ITALY	BELGIUM	BELGIUM	ITALY	USA	USA	USA	USA	USA
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)	1961	1961	1961	1961	1960	1961	1968	1968	1968	
B. USA (YEAR)(CITY FIRST INSTALLED)	1978-BOUNTIFUL	1978-SALT LAKE				1978-DETROIT	1981-CHICAGO	1981-CHICAGO	1981-CHICAGO	1979-GREENVILLE
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN	10,000,000	1,000,000	1,000,000	1,000,000	>1,000,000	NONE				
B. USA	>250,000	>250,000				48,000	24,000	345,000	27,000	28,000
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)										
A. DURATION (YEARS)	10	10	10	10	10	6,12 APDX	10	10	10	5
B. RENEWABLE AFTER INSPECTION (YES/NO)	X		NO	NO		+4 ALUM COAT				+5+5
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY	X	X	X	X	X	X	X	X	X	
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X		X	X	X	X
D. MONETARY LIMITATION D.1 NONE	X	X	X	X	X					
D.2 ORIG. COST OF INSTALT'N							X	X	X	X
D.3 $ PER SQUARE										
E. EXCLUSION FROM COVERAGE										
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X	
E.2 CONSEQUENTIAL DAMAGES						X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE	SEE APPENDIX	SEE APPENDIX	SEE APPENDIX	SEE APPENDIX	SEE APPENDIX	SEE MFG				
20. METHOD OF DISTRIBUTION	SALES/ DISTRIBUTOR	SALES/ DISTRIBUTOR	SALES/ DISTRIBUTOR	SALES/ DISTRIBUTOR	SALES/ DISTRIBUTOR	SALES FORCE	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DIRECT/ SOME DISTRS
21. NUMBER OF REGIONAL LOCATIONS	8	8	8	8	8	USA & CANADA	77	77	77	50
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS
24. SALES INFORMATION CONTACT										
25. TECHNICAL INFORMATION CONTACT	FRANZ KOLB	FRANZ KOLB	FRANZ KOLB	FRANZ KOLB	FRANZ KOLB	S T MALLARD	B JANSEN	B JANSEN	B JANSEN	D WICKS
	MARK HINTZE	MARK HINTZE	MARK HINTZE	MARK HINTZE	MARK HINTZE	S T MALLARD	P VIDOZZI	P VIDOZZI	P VIDOZZI	D WICKS
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	32	32	32	32	32	32	32	32	32	32

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MODIFIED BITUMENS Part 1 *(See Part 2 for Test Results)*

BARRA CORP OF AMERICA, THE	BARRA CORP OF AMERICA, INC	BARRA CORP OF AMERICA, INC	BARRETT CO, THE	BARRETT CO, THE	BARRETT CO, THE	BOWE CO,INC (DIBITEN)	BOWE CO,INC (DIBITEN)	BOWE CO,INC (DIBITEN)	CENTRAL SOYA COMPANY INC	CENTRAL SOYA COMPANY INC	CENTRAL SOYA COMPANY INC	CENTRAL SOYA COMPANY INC
MODI SHIELD PR	MODI SHIELD GR	MODI SHIELD AL	SHELL CARIPHALTE FR200	SHELL CARIPHALTE FR306	SHELL CARIPHALTE TORCH-ON	DIBITEN POLY-5	DIBITEN POLY-4	DIBITEN POLY-4,5 GRANULAR	COLFLEX TORCH-ON	COLFLEX MINERAL TORCH-ON	POLROOF MAXIMUM	POLROOF MAXIMUM MINERAL
160	175	160	118	157		175	157	172	118	138	138	138
PLAIN	MINERAL	ALUMINUM	SANDED MATL	CERAMIC GRANULE	CERAMIC GRANULE	SMOOTH	SMOOTH	GRANULAR	SAND	SLATE	TALCUM	SLATE
POLYESTER	POLYESTER	FIBERGLAS	POLYESTER NON-WOVEN	FIBERGLASS	FIBERGLASS	POLYESTER	POLYESTER	POLYESTER	POLYESTER	POLYESTER	POLYESTER	POLYESTER
BLACK .88	OPTIONAL .96	ALUMINUM .88	BLACK .50	ANY .90	ANY 1.2	BLACK 1.10	BLACK .88	WHITE-GREY 1.05	BLACK 0.82	GREY 0.92	BLACK 0.82	GREY 0.92
NONE	NONE	NONE		NONE	NONE	NONE	NONE	NONE	BITUMEM/ SLATE	NONE	NONE	NONE
X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
TORCH	TORCH	TORCH	HOT ASPHALT	HOT ASPHALT	TORCH	TORCHED	TORCHED	TORCHED	TORCH	TORCH	TORCH	TORCH
TORCH X	TORCH	TORCH	HOT ASPHALT HOT ASPHALT	HOT ASPHALT HOT ASPHALT	TORCH TORCH	TORCH TORCH	TORCH TORCH	TORCH TORCH	TORCH	TORCH	TORCH	TORCH
DEAD LEVEL	POS DRAIN	POS DRAIN	TO DRAIN	TO DRAIN	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
X* X* X*	X* X* X*	X* X* X*	X CONSULT BARR X	X CONSULT BARR X	X CONSULT BARR X	X X X	X X X	X X X	X* X*	X* X*	X* X*	X* X*
X* X* X* *OVERLAYMENT REQUIRED	X* X* X* *OVERLAYMENT REQUIRED	X* X* X* *OVERLAYMENT REQUIRED	X X ISOCYANURATE FOAMED GLASS INSULATING CONCRETE	X X ISOCYANURATE FOAMED GLASS INSULATING CONCRETE	X X ISOCYANURATE FOAMED GLASS INSULATING CONCRETE	X X X WOOD,METAL, CONCRETE, PROTECTION BOARD	X X X WOOD,METAL, CONCRETE, PROTECTION BOARD	X X X WOOD,METAL, CONCRETE, PROTECTION BOARD	X X** X* *PERFO TORCH REQUIRED **BIT.GLASS FIBRE FACING INCL.	X X** X* *PERFO TORCH REQUIRED **BIT.GLASS FIBRE FACING INCL.	X X** X* *PERFO TORCH REQUIRED **BIT.GLASS FIBRE FACING INCL.	X X** X* *PERFO TORCH REQUIRED **BIT.GLASS FIBRE FACING INCL.
0 F-115 F	0 F-115 F	0 F-115 F	NONE 40 F-120 F	NONE 40 F-120 F	NONE 40 F-120 F	NONE 20 F-120 F	NONE 20 F-120 F	NONE 20 F-120 F	0 F-115 F	0 F-115 F	0 F-115 F	0 F-115 F
SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL
TORCH	TORCH	TORCH	HOT ASPHALT	HOT ASPHALT	TORCH	TORCHED	TORCHED	TORCHED	TORCH	TORCH	TORCH	TORCH
NO	NO	NO	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED	NONE	NONE	NONE				
USA	USA	USA	FRANCE CANADA	FRANCE CANADA	CANADA CANADA	ITALY ITALY	ITALY ITALY	ITALY ITALY	HOLLAND HOLLAND	HOLLAND HOLLAND	HOLLAND HOLLAND	HOLLAND HOLLAND
1968 1981-CHICAGO	1968 1981-CHICAGO	1968 1981-CHICAGO	1968 1978	1968 1978	1984 1984- NEW JERSEY	1969 1978- NEW JERSEY	1969 1978- NEW JERSEY	1978 1978- NEW JERSEY	1977 1984	1977 1984	1980 1984	1980 1984
72,886	6,516	6,800	5,000,000 10,000	5,000,000 10,000	NOT AVAIL NOT AVAIL	410,000 75,000	7,000,000 400,000	500,000 50,000				
10	10	10	10	10	5	12	10	10	10	10	10	10
X X	X X	X X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X				
X X	X X	X X	X X	X X	X X	X X	X X	X X				
						SEE SPECS	SEE SPECS	SEE SPECS				
DIRECT TO CONTRACTORS 8 YES	DIRECT TO CONTRACTORS 8 YES	DIRECT TO CONTRACTORS 8 YES	DISTRIBUTORS DIRECT 15 YES	DISTRIBUTORS DIRECT 15 YES	DISTRIBUTORS DIRECT 15 YES	DISTRIBUTORS 5 NO	DISTRIBUTORS 5 NO	DISTRIBUTORS 5 NO	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS
FIELD	FIELD	FIELD	FACTORY & FIELD SEMINARS	FACTORY & FIELD SEMINARS	FACTORY & FIELD SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS				
CUST SERVICE TECH SERVICE	CUST SERV TECH SERV	CUST SERV TECH SERV	G HEXHAM R MCNULTY	G HEXHAM R MCNULTY	G HEXHAM R MCNULTY	C WHITLEY E FAVARO	C WHITLEY E FAVARO	C WHITLEY E FAVARO	S DAILEY S DAILEY	S DAILEY S DAILEY	S DAILEY S DAILEY	S DAILEY S DAILEY
32	32	32	32	32	32	32	32	33	33	33	33	33

MODIFIED BITUMENS Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	CENTRAL SOYA COMPANY INC	CENTRAL SOYA COMPANY INC	CIRO ROOFING PRODUCTS USA, INC	CIRO ROOFING PRODUCTS USA, INC	CIRO ROOFING PRODUCTS USA,INC	CIRO ROOFING PRODUCTS USA,INC	CIRO ROOFING PRODUCTS USA,INC	CONSOLIDATED PROTECTIVE COATINGS CORPORATION	CONSOLIDATED PROTECTIVE COATINGS CORPORATION	DANOSA CARIBBEAN, INC
2. PRODUCT NAME	PERFO TORCH	COLROOF	CSP-4000 APP	CSP-4500 APP	CSV-4000 ALV-APP	CSP-4000 SBS	CSP-4500 SBS	CONSO-GARD	CONSO-GARD II	GLASDAN R-36
3. PRODUCT DESCRIPTION:										
A. TYPE OF BITUMEN MODIFIER										
B. THICKNESS (MILS)	60	60	165	165	165	165	165	118	157	140
C. TOP SURFACE	POLYETHYLENE	TALCUM	PLAIN	GRANULATED	ALUMINUM	PLAIN	GRANULATED	PLAIN	PLAIN	BITUMEN
D. REINFORCEMENT MATERIAL	GLASS FIBER	POLYESTER	POLYESTER	POLYESTER	FIBERGLASS	POLYESTER	POLYESTER	POLYESTER	POLYESTER	GLASS FIBER
E. COLOR	BLACK	BLACK	PLAIN	WH/GR/BRN	SILVER	PLAIN	WH/GR/BRN	BLACK	BLACK	BLACK
F. INSTALLED WT (lbs/ft² W/O BALLAST)	0.32	0.41	.89	.99	.89			.60	.90	.77
4. COATING REQUIRED			YES	NO	NO	YES	NO	YES	YES	EMULSION, 2ND MEMBR, BALLST
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X	X	X	X
B. REROOFING	X	X	X	X	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD		MOP	TORCH	TORCH	TORCH	TORCH/MOPPED	TORCH/MOPPED	TORCH	TORCH	TORCH OR HOT ASPHALT
7. TYPE OF ROOF SYSTEM:										
A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)	LOOSE	X	X	X	X	X	X	10	10	
B. PARTIALLY ADHERED (METHOD)	X	X	X	X	X	X	X	X	X	
C. FULLY ADHERED (METHOD)		X	X	X	X	X	X	X	X	TORCH/HOT AS
D. PROTECTED MEMBRANE ROOFING ASSEMBLY	X	X	X	X	X	X	X	X	X	
8. MINIMUM SLOPE	DEAD LEVEL	DEAD LEVEL						DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
9. USE OVER:										
A. PERLITE		X	X	X	X	X	X	X	X	X
B. POLYURETHANE	X	X*	X	X	X	X	X	X	X	X
C. WOOD FIBER	X	X	X	X	X	X	X	BASE SHT REQ	BASE SHT REQ	X
D. GLASS FIBER	X	X	X	X	X	X	X	X	X	X
E. EXPANDED POLYSTYRENE	X**	X**	X	X	X	X	X			X
F. FELT FACED COMPOSITES	X	X**	X	X	X	X	X	X	X	X
G. OTHER	**BIT.GLASS FIBRE FACING INCL.	*PERFO TORCH REQUIRED **BIT.GLASS FIBRE FACING INCL.						WOOD,METAL CONCRETE	WOOD,METAL CONCRETE	
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)			NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
11. WORKABLE TEMPERATURE RANGE	0 F-115 F	0 F-115 F	15 F-120 F	15 F-120 F	15 F-120 F	0 F-115 F	0 F-115 F	40 F-115 F	40 F-115 F	14 F-120 F
12. FLASHING MATERIAL			SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	GLAS AL-80 OR ESTERDAN RM
13. FLASHING METHOD			TORCHED	TORCHED	TORCHED	TORCHED OR MOPPED	TORCHED OR MOPPED	TORCH	TORCH	TORCH AND HOT ASPHALT
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO			YES	YES	YES	YES	YES	NO	NO	NO
15. COUNTRY: A. ORIGIN	HOLLAND	HOLLAND	ITALY	ITALY	ITALY	ITALY	ITALY	USA	USA	PUERTO RICO
B. MANUFACTURE	HOLLAND	HOLLAND	USA	USA	USA	ITALY	ITALY	USA	USA	PUERTO RICO
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)	1984		1968	1968	1968	1968	1968			
B. USA (YEAR)(CITY FIRST INSTALLED)			1979	1979	1979	1979	1979	1980- CLEVELAND	1980- CLEVELAND	1979- SAN JUAN,PR
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN			20,000,000+	20,000,000+	20,000,000+	20,000,000+	20,000,000+			
B. USA			500,000+	500,000+	500,000+	100,000+	100,000+	500,000	200,000	5,000
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)										
A. DURATION (YEARS)			10	10	10	10	10	10	10	5 & 10
B. RENEWABLE AFTER INSPECTION (YES/NO)			NO	NO	NO	NO	NO			X
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY								X	X	
C.2 WORKMANSHIP & MAT'L			X	X	X	X	X			X
D. MONETARY LIMITATION D.1 NONE			X	X	X	X	X			
D.2 ORIG. COST OF INSTALT'N										X
D.3 $ PER SQUARE										X
E. EXCLUSION FROM COVERAGE										
E.1 DAMAGE TO OTHER BUILDING COMPONENTS								X	X	X
E.2 CONSEQUENTIAL DAMAGES								X	X	X
19. LIMITATIONS OR RESTRICTED USE			SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS			SEE SPECS
20. METHOD OF DISTRIBUTION	DISTRIBUTORS	DISTRIBUTORS	GEORGIA PACIFIC CORP	GEORGIA PACIFIC CORP	GEORGIA PACIFIC CORP	GEORGIA PACIFIC CORP	GEORGIA PACIFIC CORP	DIRECT	DIRECT	DISTRIBUTORS
21. NUMBER OF REGIONAL LOCATIONS										2
22. LICENSED APPLICATOR AGREEMENT (YES/NO)			YES	YES	YES	YES	YES	NO	NO	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)			YES	YES	YES	YES	YES	YES	YES	SEMINARS, ON JOB TRAINING
24. SALES INFORMATION CONTACT	S DAILEY	S DAILEY	GEORGIA PAC	GEORGIA PAC	GEORGIA PAC	GEORGIA PAC	GEORGIA PAC	F MALLOY	F MALLOY	M DEL RIO
25. TECHNICAL INFORMATION CONTACT	S DAILEY	S DAILEY	GP OR CIRO	GP OR CIRO	GP OR CIRO	GP OR CIRO	GP OR CIRO	G KURTZHALS	G KURTZHALS	R MUR
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	33	33	33	33	33	33	33	33	33	33

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MODIFIED BITUMENS Part 1 *(See Part 2 for Test Results)*

DANOSA CARIBBEAN, INC	DANOSA CARIBBEAN, INC	DANOSA CARIBBEAN, INC	FLEX-SHIELD CORP	FLEX-SHIELD CORP	GARLAND COMPANY, THE	GARLAND COMPANY, THE	GARLAND CO, INC, THE	GEDACO, LTD (ITALY)	GEDACO, LTD (ITALY)	GEDACO, LTD (ITALY)	GEDACO, LTD (ITALY)	GEDACO, LTD (ITALY)
ESTERDAN R-36	GLASDAN AL-80	ESTERDAN RM	F.A.R. MARK II	FLEX SHIELD MARK IV	STRESSPLY	PITCHPLY	GARLAPLY	GEDAGOM POLYESTER CONT FILAMNT	GEDAGOM POLYESTER	GEDAGOM VELO/VETRO	GEDAGOM VELO/VETRO EXTRA	GEDAGOM GRANIPOL
140	140	140	75	150	80	60	160	160	160	160	160	160
BITUMEN	ALUMINUM	MINERAL GRANULES	POLY-PROPYLENE	MOD BITUMEN		ALUMINUM	MOD BITUMEN	MOD BITUMEN	MOD BITUMEN	MOD BITUMEN	MOD BITUMEN	SLATE CHIP
POLYESTER	GLASS FIBER	POLYESTER	POLY-PROPYLENE	POLYESTER	2 PLIES WOVEN GLASS	UNREINFORCED	POLYESTER	POLYESTER NON-WOVEN FABRIC	POLYESTER	FIBERGLASS	SPECIAL FIBERGLASS	POLYESTER NON-WOVEN FABRIC
BLACK .77	ALUMINUM .77	WHITE/OTHER .77	BLACK .40	BLACK .88	BLACK 1.65 W/GRAVL	BLACK 1.5 W/GRAVL	BLACK .90	BLACK .88	BLACK .88	BLACK .88	BLACK .88	GREY-GREEN .88
EMULSION, 2ND MEMBR, BALLST	NONE	NONE	COATING OR GRAVEL	RECOMMENDED	GRAVEL OR ALUM	GRAVEL	NONE	ALUMINUM OR GRAVEL	ALUMINUM OR GRAVEL	ALUMINUM OR GRAVEL	ALUMINUM OR GRAVEL	NONE
X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
TORCH OR HOT ASPHALT	TORCH OR HOT ASPHALT	TORCH OR HOT ASPHALT	SELF ADHERNG	TORCH X	BITUMEN/ ADHESIVE	BITUMEN/ ADHESIVE	TORCH	TORCH	TORCH	TORCH	TORCH	TORCH
TORCH/HOT AS	TORCH/HOT AS	TORCH/HOT AS	SELF ADHERNG	TORCH	X X	X X	TORCH	TORCH	TORCH	TORCH	TORCH	TORCH
DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	1/4"	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
X X X	X X X	X X X	 X 	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
X X X	X X X	X X X	X X BUR, CONCR, WOOD, EPDM	X X X	X X	X X	X X	X X X	X X X	X X X	X X X	X X X
NONE 14 F-120 F	NONE 14 F-120 F	NONE 14 F-120 F	NONE 40 F-120 F	0 F-120 F	35 F-120 F	35 F-120 F	35 F-120 F	NONE 0 F-120 F	NONE 0 F-120 F	NONE 10 F-120 F	NONE 10 F-120 F	NONE 10 F-120 F
GLASD AL-80 OR ESTERDAN RM	SAME MATL OR ESTERDAN RM	SAME MATL OR GLASDAN AL-80	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL
TORCH OR HOT ASPHALT	TORCH OR HOT ASPHALT	TORCH OR HOT ASPHALT	SELF ADHERNG	TORCH	BITUMEN/ ADHESIVE	BITUMEN/ ADHESIVE	TORCH	TORCH	TORCH	TORCH	TORCH	TORCH
NO	NO	NO		NO	NO	YES	NO	NO	NO	NO	NO	NO
PUERTO RICO PUERTO RICO	PUERTO RICO PUERTO RICO	PUERTO RICO PUERTO RICO	SA SA	ITALY USA	USA USA	ENGLAND USA	GERMANY USA	ITALY ITALY	ITALY ITALY	ITALY ITALY	ITALY ITALY	ITALY ITALY
1979- SAN JUAN, PR	1979- SAN JUAN, PR	1979- SAN JUAN, PR		1961 1978-DETROIT	1978- CLEVELAND	1965 1965- CLEVELAND	1965 1980- PITTSBURGH	1970 1981- NEW JERSEY	1970 NONE	1970 NONE	1970 NONE	1970 NONE
8,000	10,000	15,000		15,000,000 100,000	75,000	5,000,000+ 80,000+	5,000,000+ 50,000	4,687,500 4,000	>2,000,000 NONE	>1,000,000 NONE	>1,500,000 NONE	>500,000 NONE
5 & 10 X X	5 & 10 X X	5 & 10 X X	5 5 + 5 X	5, 10 +5 X	10 X	10 X	10 X	10 X X	10 X	10 X	10 X	10 X
X X X X	X X X X	X X X X	X X	X X X	NONE X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
SEE SPECS	SEE SPECS	SEE SPECS										
DISTRIBUTORS 2 YES	DISTRIBUTORS 2 YES	DISTRIBUTORS 2 YES	DIRECT/ DISTRS YES	DIRECT/ DISTRS YES	COMPANY SALES FORCE 78 YES	COMPANY SALES FORCE 78 YES	COMPANY SALES FORCE 78 YES	DISTRIBUTORS PENDING	DISTRIBUTORS PENDING NO	DISTRIBUTORS PENDING	DISTRIBUTORS PENDING	DISTRIBUTORS PENDING
SEMINARS, ON JOB TRAINING	SEMINARS, ON JOB TRAINING	SEMINARS, ON JOB TRAINING	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD SEMINARS (PENDING)	FIELD SEMINARS (PENDING)	FIELD SEMINARS (PENDING)	FIELD SEMINAR (PENDING)	FIELD SEMINARS (PENDING)
M DEL RIO R MUR	M DEL RIO R MUR	M DEL RIO R MUR	C CARROLL C CARROLL	C CARROLL C CARROLL	R DEBACCO J FOGEL	R DEBACCO J FOGEL	R DEBACCO J FOGEL	H RUSSO H RUSSO	H RUSSO H RUSSO	H RUSSO H RUSSO	H RUSSO H RUSSO	H RUSSO H RUSSO
33	33	33	33	33	33	33	34	34	34	34	34	34

MODIFIED BITUMENS Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	GEDACO,LTD (ITALY)	GENSTAR BUILDING MATERIALS CO	GUAINA CORP OF AMERICA & POLYPREN RFG OF AMER	GUAINA CORP OF AMERICA & POLYPREN RFG OF AMER	GUAINA CORP OF AMERICA & POLYPREN RFG OF AMER	GUAINA CORP OF AMERICA & POLYPREN RFG OF AMER	GUAINA CORP OF AMERICA & POLYPREN RFG OF AMER	HEY 'DI UPM CORP	HITCHINS AMERICA,INC	HYLOAD,INC
2. PRODUCT NAME	GEDAGOM GRANIVEL	FLINTLASTIC SBS	GUAINA POLYGLASS	GUAINA POLYGLASS ALUMINUM	GUAINA POLYGLASS POLYESTER	GUANIA POLYGLASS GRANULAR	GUAINA POLYPREN ECB	HEY 'DI ECB	NURALITE	HYLOAD 150E
3. PRODUCT DESCRIPTION:										
A. TYPE OF BITUMEN MODIFIER										
B. THICKNESS (MILS)	160	104	158	160	160	170	83	83	100	60
C. TOP SURFACE	SLATE CHIP	GRANULES	PLAIN	ALUMINUM	PLAIN	MINERAL	PLAIN		ASPHALT	BLACK .
D. REINFORCEMENT MATERIAL	SPECIAL FIBERGLASS	PVA & GLASS MAT	FIBERGLASS	FIBERGLASS	POLYESTER	POLYESTER OR FIBERGLASS	NON-WOVEN FIBERGLASS	NOV-WOVEN FIBERGLASS	MINERAL FIBERS	DISPERSED POLYESTER
E. COLOR	GREY-GREEN	WHITE	BLACK	ALUMINUM	BLACK	RD/WH/GR/BRN	BLACK	BLACK	BLK-TURNS GR	BLACK
F. INSTALLED WT (lbs/ft² W/O BALLAST)	.88	148-2 PLY SY	.88	.88	.88	.95	.50	.50	.50	.40
4. COATING REQUIRED	NONE		NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X	X	X	X
B. REROOFING	X	X	X	X	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD	TORCH	HOT MOP	TORCH	TORCH	TORCH	TORCH	HOT AIR	HOT AIR WELDING	TORCH	HOT ASPHALT
7. TYPE OF ROOF SYSTEM:										
A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)										
B. PARTIALLY ADHERED (METHOD)							10 LBS	10 LBS		
C. FULLY ADHERED (METHOD)	TORCH	HOT MOP	TORCH	TORCH	TORCH	TORCH	HOT ASPHALT	HOT ASPHALT	SPOT ADHERED	
D. PROTECTED MEMBRANE ROOFING ASSEMBLY							HOT ASPHALT	HOT ASPHALT		HOT ASPHALT
8. MINIMUM SLOPE	DEAD LEVEL		DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL		DEAD LEVEL
9. USE OVER:										
A. PERLITE	X	X*	X	X	X	X	X	X		X
B. POLYURETHANE	X	X*	X	X	X	X	X	X	X*	X
C. WOOD FIBER	X	X*	X	X	X	X	X	X		X
D. GLASS FIBER	X	X*	X	X	X	X	X	X		X
E. EXPANDED POLYSTYRENE	X		X	X	X	X	X	X	X*	
F. FELT FACED COMPOSITES	X	X*	X	X	X	X	X	X		X
G. OTHER		CYANURATE*, CELULAR GLA *USE W/CTD BASE SHT IN 2 PLY CONST	ANY SKINNED INSUL,WOOD, METAL,CONCR, PROTECTION BOARD	ANY SKINNED INSUL,WOOD, METAL,CONCR, PROTECTION BOARD	ANY SKINNED INSUL,WOOD, METAL,CONCR, PROTECTION BOARD	ANY SKINNED INSUL,WOOD, METAL,CONCR, PROTECTION BOARD	ANY SKINNED INSUL,WOOD, METAL,CONCR, PROTECTION BOARD		CONCRETE,INS CONCR,*RIGID SKINNED INSULATION	GLASS FIBER BASE SHEET
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE		NONE	NONE	NONE	NONE	NONE	X	NONE	NONE
11. WORKABLE TEMPERATURE RANGE	10 F-120 F	10 F-120 F	10 F-120 F	10 F-120 F	10 F-120 F	10 F-120 F	-30 F-150 F	-30 F-150 F	NO RESTRNS	40 F-110 F
12. FLASHING MATERIAL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL OR ECB ADHESIVE	ECB COLD ADHESIVE	SAME MATL	SAME MATL
13. FLASHING METHOD	TORCH	PLASTIC CEMENT TO MASRY	TORCH	TORCH	TORCH	TORCH	TORCH OR HOT ADHESIVE	HOT ASPHALT	ADHESIVE	HOT ASPHALT/ COLD MASTIC
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	NO		NO	NO	NO	NO	YES	YES	NO	NO
15. COUNTRY: A. ORIGIN	ITALY	HOLLAND	ITALY	ITALY	ITALY	ITALY	ITALY	W GERMANY	ENGLAND	ENGLAND
B. MANUFACTURE	ITALY	USA	ITALY	ITALY	ITALY	ITALY	ITALY	USA	ENGLAND	USA
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)	1970	1972	1960	1960	1960	1960	1965	1964	1947	1965
B. USA (YEAR)(CITY FIRST INSTALLED)	NONE	1980- JERSEY CITY	1978- NEW JERSEY	1978- NEW JERSEY	1978- NEW JERSEY	1978- NEW JERSEY	1978- NEW JERSEY	1982- ST LOUIS	1978- ORLANDO	1976- CLEVELAND
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN	>300,000	>100,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000	15,000,000	2-3 MILLION	>5,000,000
B. USA	NONE	20,000	50,000	50,000	75,000	50,000	55,000	15,000	150,000	130,000
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)										
A. DURATION (YEARS)	10	10	10	10	10	10	10	10	10-LAB/25MAT	10
B. RENEWABLE AFTER INSPECTION (YES/NO)										
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY										
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE	X		X	X	X	X	X	X	X	X
D.2 ORIG. COST OF INSTALT'N										
D.3 $ PER SQUARE		100						X		
E. EXCLUSION FROM COVERAGE										
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X		X	X
19. LIMITATIONS OR RESTRICTED USE								SEE SPECS		NONE
20. METHOD OF DISTRIBUTION	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	HITCHINS	DISTRIBUTORS
21. NUMBER OF REGIONAL LOCATIONS	PENDING	3	23	23	23	23	23	12	4	12
22. LICENSED APPLICATOR AGREEMENT (YES/NO)		YES	NO	NO	NO	NO	NO	YES	YES	NO
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FIELD SEMINARS (PENDING)	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS, FACTORY	FIELD
24. SALES INFORMATION CONTACT	H RUSSO	D P O'LEARY	B MITZMAN	B MITZMAN	B MITZMAN	B MITZMAN	B MITZMAN	H MUENCH	D BRAY	A W HARKNESS
25. TECHNICAL INFORMATION CONTACT	H RUSSO	D R HUGHES	B MITZMAN	B MITZMAN	B MITZMAN	B MITZMAN	B MITZMAN	H MUENCH	M SHANE	R BONAFONT
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	34	34	34	34	34	34	34	34	34	34

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MODIFIED BITUMENS Part 1 *(See Part 2 for Test Results)*

INDEX SPA TECHOLOGIE IMPERMEABILI	INDEX SPA TECHOLOGIE IMPERMEABILI	INDEX SPA TECHOLOGIE IMPERMEABILI	INDEX SPA TECHOLOGIE IMPERMEABILI	INDEX SPA TECHOLOGIE IMPERMEABILI	INDEX SPA TECHOLOGIE IMPERMEABILI	J & P PETROLEUM PRODUCTS	KELLY ENERGY SYSTEMS,INC	KIMMENADE CORP,THE	KIMMENADE CORP,THE	HERBERT MALARKEY ROOFING CO	HERBERT MALARKEY ROOFING CO	NORD BITUMI US INC
TESTUDO 4	MINERAL TESTUDO 4,5	HELASTA/P 4	MINERAL HELASTA P4,5	DEFEND 4	MINERAL DEFEND 4,5	AQUASEL 2001 AD	SINGLE STEP BUR	DURALASTA P	DURALASTA M	MHP POLYESTER CAP	MHP GLASS CAP	NORDPOLY 4B APP
160	172	160	175	160	172	60 +/- 5	150	160	160	100	100	160
SMOOTH	GRANULAR	SMOOTH	GRANULAR	SMOOTH	GRANULAR	POLYETHYLENE	MOD BITUMEN	OPTIONAL	SLATE CHIP	GRANULE	GRANULE	MOD BITUMEN
SPUNBOND POLYESTER	IDEM	IDEM	IDEM	FIBERGLASS	FIBERGLASS	POLYESTER POLYESTER	POLYESTER	POLYESTER	POLYESTER	POLYESTER	FIBERGLASS	POLYESTER
BLACK .88	VARIOUS .99	BLACK .88	VARIOUS .99	BLACK .88	VARIOUS .99	GREY/BLACK .80	BLACK .88	BLACK 1.0	GREEN/BLUE 1.0	VARIOUS 1.0	WHITE .80	BLACK 0.88
OPTIONAL ALUM PAINT	NONE	OPTIONAL ALUM PAINT	NONE	OPTIONAL ALUM PAINT	NONE	YES	ALUMINUM RECOMMENDED	SURFACING	NONE	NONE	NONE	ALUMINUM (AS RECOMMENDED)
X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
TORCH	TORCH	TORCH	TORCH	TORCH	TORCH	SELF-ADHERED	TORCH	TORCH/ HOT ASPHALT	TORCH/ HOT ASPHALT	HOT ASPHALT	HOT ASPHALT	TORCH
10 TORCH TORCH	TORCH TORCH	10 TORCH TORCH	TORCH TORCH	TORCH TORCH	TORCH TORCH	PRIMER	TORCH	TORCH/HOT AS TORCH/HOT AS TORCH/HOT AS	TORCH/HOT AS TORCH/HOT AS TORCH/HOT AS	HOT ASPHALT	HOT ASPHALT	10 TORCH TORCH TORCH
DEAD LEVEL	DEAD LEVEL	DEAL LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	1/4" PER FT	DEAD LEVEL	DEAD LEVEL	1/4"	1/4"	DEAD LEVEL
X X X	X X X	X X X	X X X	X X X	X X X	X X	X X X	X* X* X*	X* X* X*	X X	X X	X X X
X X X FELT BASE SHEET WHEN REQUIRED	X X X FELT BASE SHEET WHEN REQUIRED	X X X FELT BASE SHEET WHEN REQUIRED	X X X FELT BASE SHEET WHEN REQUIRED	X X X FELT BASE SHEET WHEN REQUIRED	X X X FELT BASE SHEET WHEN REQUIRED	X CONCRETE, STEEL	X X X BASE SHEET REQ OVER NON REINFORCED INSULATION	X* X* X* CTD GL FIBER BASE SHT AT-TCHD TO INSU LTN OR EXIS-TING MEMB	X* X* X* CTD GL FIBER BASE SHT AT-TCHD TO INSU LTN OR EXIS-TING MEMB	X X	X X	X X X SEE SPECS
NONE 40 F-120 F	NONE 40 F-120 F	NONE 40 F-120 F	NONE 40 F-120 F	NONE 40 F-120 F	NONE 40 F-120 F	40 F MIN	1 0 F-120 F	NONE 30 F-120 F	NONE 30 F-120 F	NONE 20 F-100 F	NONE 40 F-100 F	NONE 0 F-110 F
SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	ECB	SAME MATL	SAME MEMBRANE	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL
TORCH	TORCH	TORCH	TORCH	TORCH	TORCH	PRIMER	TORCH	TORCH/ HOT ASPHALT	TORCH/ HOT ASPHALT	HOT ASPHALT	HOT ASPHALT	TORCH
NONE	NONE	NONE	NONE	NONE	NONE	YES	NO	NO	NO	UNNECESSARY	UNNECESSARY	UNNECESSARY
ITALY ITALY	ITALY ITALY	ITALY ITALY	ITALY ITALY	ITALY ITALY	ITALY ITALY	USA USA	USA USA	NETHERLANDS GERMANY	NETHERLANDS GERMANY	W GERMANY USA	 USA	ITALY USA
1978 1980- NEW YORK	1978 1980- NEW YORK	1978	1978	1978 1980- NEW YORK	1978	1983 1983-DENVER	1970 1984- WATERBURY	1978 1982- ST LOUIS	1978 1982 ST LOUIS	 1982-SEATTLE	 1982-SPOKANE	1967 1976-DETROIT
1,200,000 30,000	800,000 1,000	200,000	100,000	2,000,000 15,000	1,000,000 600			80,000 2,000	85,000 15,000			15,000,000 100,000
10 X	10 X	10 X	10 X	10 X	10 X	10 X		10 X X	10 X X	5 OR 10 YES X	5 OR 10 YES X	5/10 +5/- X/- -/X
X	X	X	X	X	X	X		X	X	X	X	-/X
X X	X X	X X	X X	X X	X XX	X X		X X	X X	X X	X X	X X
DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DIRECT/DIST	DISTRIBUTORS	DISTRS/CONTR	DISTRS/CONTR	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS
3 NO	3 NO	3 NO	3 NO	3 NO	3 NO	 YES	62 NO	5 YES	5 YES	 X	 X	3 YES
FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, FACTORY, SEMINARS	FIELD, SEMINARS	FIELD	FIELD	FIELD & FACTORY	FIELD & FACTORY	FIELD, SEMINARS
						R WOOD R WOOD	T ARRAS A POREMBA T ARRAS A POREMBA	H LANDHEER H LANDHEER	H LANDHEER H LANDHEER	J CLENAGHEN K WOODSIDE	J CLENAGHEN K WOODSIDE	G LUBISCO J SCHUBERT
34	34	35	35	35	35	35	35	35	35	35	35	35

MODIFIED BITUMENS Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	NORD BITUMI US INC	NORD BITUMI US INC	NORD BITUMI US INC	NORD BITUMI US INC	OWENS-CORNING FIBERGLAS CORP	OWENS-CORNING FIBERGLAS CORP	ROYAL OIL COMPANY	SIPLAST,INC	SIPLAST,INC	SIPLAST,INC
2. PRODUCT NAME	NORDPOLY 4M APP	NORDPOLY 5B APP	NORDFLEX S SBS	NORDFLEX M SBS	OWENS-CORNING DERBIGUM HPS	OWENS-CORNING DERGIBUM SP	ROYAL	VERAL (ALUM FACED)	VERAL (STAIN/ STEEL)	VERAL (COPPER)
3. PRODUCT DESCRIPTION:										
A. TYPE OF BITUMEN MODIFIER										
B. THICKNESS (MILS)	160	200	160	160	160	160	150	130	130	130
C. TOP SURFACE	MINERAL	MOD BITUMEN	MOD BITUMEN	MINERAL	MOD BITUMEN	MOD BITUMEN	MOD BITUMEN	ALUMINUM	STAIN/STEEL	COPPER
D. REINFORCEMENT MATERIAL	POLYESTER	POLYESTER	POLYESTER	POLYESTER	POLYESTER GLASFIBER MAT/WEB	POLYESTER GLASFIBER MAT	POLYESTR NON WOVEN FABRIC	GLASS SCRIM	GLASS SCRIM	GLASS SCRIM
E. COLOR	SLATE GREY	BLACK	BLACK	SLATE GREY	BLACK	BLACK	BLACK	ALUMINUM	STAIN/STEEL	COPPER
F. INSTALLED WT (lbs/ft² W/O BALLAST)	.95	1.1	.90	.95	1.0	1.0	.88	.86	.86	.86
4. COATING REQUIRED	NONE	ALUMINUM (AS RECOMMENDED)	ALUMINUM (AS RECOMMENDED)	NONE	NONE	NONE	ALUMINUM	NONE	NONE	NONE
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X	X	X	X
B. REROOFING	X	X	X	N/A	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD	TORCH	TORCH	HOT MOP/TORC	HOT MOP/ TORCH	TORCH	TORCH	TORCH	HOT/TORCH	HOT/TORCH	HOT/TORCH
7. TYPE OF ROOF SYSTEM:										
A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)	N/A	10	10							
B. PARTIALLY ADHERED (METHOD)	TORCH	TORCH	HOT MOP/TORC	HOT MOP/TORC			X			
C. FULLY ADHERED (METHOD)	TORCH	TORCH	HOT MOP/TORC	HOT MOP/TORC	TORCH	TORCH	TORCH	HOT/TORCH	HOT/TORCH	HOT/TORCH
D. PROTECTED MEMBRANE ROOFING ASSEMBLY	N/A	TORCH	HOT MOP/TORC	N/A						
8. MINIMUM SLOPE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	1/2 INCH	1/2 INCH	1/2 INCH
9. USE OVER:										
A. PERLITE	X	X	X	X	X*	X*	X	X	X	X
B. POLYURETHANE	X	X	X	X	X*	X*	X			
C. WOOD FIBER	X	X	X	X	X*	X*	X	X	X	X
D. GLASS FIBER	X	X	X	X	X*	X*	X	X	X	X
E. EXPANDED POLYSTYRENE	X	X	X	X	X*	X*				
F. FELT FACED COMPOSITES	X	X	X	X	X*	X*	X			
G. OTHER	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	*OVERLAYMENT REQD	*OVERLAYMEN REQD		CELLULAR GLS ALWAYS USE W/FG BASE SH AS A SYSTEM	CELLULAR GLS ALWAYS USE W/FG BASE SH AS A SYSTEM	CELLULAR GLS ALWAYS USE W/FG BASE SH AS A SYSTEM
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE				
11. WORKABLE TEMPERATURE RANGE	0 F-110 F	0 F-110 F	0 F-110 F	0 F-110 F	25 F-140 F	25 F-140 F	0 F-120 F			
12. FLASHING MATERIAL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL	SAME MATL
13. FLASHING METHOD	TORCH	TORCH	HOT MOP/ TORCH	HOT MOP/ TORCH	TORCH	TORCH	TORCH	TORCH	TORCH	TORCH
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	UNNECESSARY	UNNECESSARY	UNNECESSARY	NO	NO	NO	NO	UNNECESSARY	UNNECESSARY	UNNECESSARY
15. COUNTRY: A. ORIGIN	ITALY	ITALY	ITALY	ITALY	ITALY	ITALY	ITALY	FRANCE	FRANCE	FRANCE
B. MANUFACTURE	USA	USA	USA	USA	USA	USA	USA	FRANCE	FRANCE	FRANCE
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)	1967	1967	1977	1977			1961			
B. USA (YEAR)(CITY FIRST INSTALLED)	1983-CHICAGO	1983-NEWARK	1984-DALLAS	1984-DALLAS	1981-KANSAS CITY	1978-VALLEY FORGE	1978-DETROIT			
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN	10,000,000	4,000	6,000,000			>15,000,000	NONE			
B. USA	3,000	1,000	1,000	1,000	NOT REPORTED	NOT REPORTE	19,000			
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)										
A. DURATION (YEARS)	5/10	5/10	5/10	5/10	10	10	6	10	10	10
B. RENEWABLE AFTER INSPECTION (YES/NO)	+5/-	+5/-	+5/-	+5/-			+6 ALUM CTG	NO	NO	NO
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY	X/-	X/-	X/-	X/-			X			
C.2 WORKMANSHIP & MAT'L	-/X	-/X	-/X	-/X	X	X		X	X	X
D. MONETARY LIMITATION D.1 NONE					X	X		X	X	X
D.2 ORIG. COST OF INSTALT'N	-/X	-/X	-/X	-/X						
D.3 $ PER SQUARE										
E. EXCLUSION FROM COVERAGE										
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE								SEE SIPLAST	SEE SIPLAST	SEE SIPLAST
20. METHOD OF DISTRIBUTION	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTR/DIRECT	DISTR/DIREC	SALES FORCE	DIRECT	DIRECT	DIRECT
21. NUMBER OF REGIONAL LOCATIONS	3	3	3	3	THRU-OUT USA	THRU-OUT US	THRU-OUT USA	5	5	5
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS
24. SALES INFORMATION CONTACT	G LUBISCO	G LUBISCO	G LUBISCO	G LUBISCO	LOCAL BRANCH OFF	LOCAL BRANCH OFF	P PATE	J MOLLENHOFF	J MOLLENHOFF	J MOLLENHOFF
25. TECHNICAL INFORMATION CONTACT	J SCHUBERT	J SCHUBERT	J SCHUBERT	J SCHUBERT	LOCAL BRANCH OFF	LOCAL BRANCH OFF	ROYAL OIL CO	BAUMGARDNER	BAUMGARDNER	BAUMGARDNER
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	35	35	35	35	35	35	35	35	35	35

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MODIFIED BITUMENS Part 1 *(See Part 2 for Test Results)*

SIPLAST, INC	SIPLAST, INC	SIPLAST, INC	SIPLAST, INC	SIPLAST, INC	SOUTHWESTERN PETROLEUM COMPANY	TAMKO ASPHALT PRODUCTS, INC	TELTEX, INC	TEXAS REFINERY CORP	TREMCO INC	TREMCO INC	TREMCO INC	TREMCO INC
PARAFOR-50	PARADIENE-30	PARADIENE-20	PARADIENE 20 PR	PARADIENE 40	SWEPCO UNI+SHIELD	AWAPLAN	RHOFLEX	MIGHTYPLATE	THERM MB 3G25	THERM MB 3G255	THERM MB 3G40	THERM MB 4G40
150	95	90	90	137	150	160	160	150				
MINERAL	MINERAL	PLAIN	PLAIN		MODIF'D ASPH	GRANULE	CAN BE COATD	MOD BITUMEN	GRANULE	SMOOTH	GRANULE	GRANULE
POLYESTER	GLASS MAT	GLASS MAT	FIBERGLASS POLYESTER	FGLS MAT FGLS SCRIM	POLYESTER	POLYESTER	POLYESTER	POLYESTER NON-WOVEN FABRIC	WOVEN GLASS POLYESTER	WOVEN GLASS POLYESTER	WOVEN GLASS POLYESTER	WOVEN GLASS POLYESTER
VARIOUS 1.47	VARIOUS .77	BLACK .48	BLACK .48	VARIOUS 1.06	BLACK .88	WHITE/BLACK 1.05	BLACK .88	BLACK .88				
NONE	NONE	PARADIENE 30	PARADIENE 30	NONE		COATING FOR UL APPROVAL	NONE	ALUMINUM	NONE	MULTIPLE OPTIONS	NONE	NONE
X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
HOT/TORCH		HOT ASPHALT	HOT ASPHALT			HT ASPH/TRCH	TORCH	TORCH	HOT MELT MOD BITUMEN	HOT MELT MOD BITUMEN	HOT MELT MOD BITUMEN	HOT MELT MOD BITUMEN
HOT/TORCH	HOT ASPHALT HOT ASPHALT	HOT ASPHALT HOT ASPHALT HOT ASPHALT	HOT ASPHALT HOT ASPHALT HOT ASPHALT	HOT ASPHALT HOT ASPHALT	X X	HT ASPH/TRCH	TORCH DOW IRMA	X X	X	X	X	X
1/2 INCH	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL		1/4"	1/4" PER FT	DEAD LEVEL	DEAD LEVEL	1/4"	1/4"	1/4"	1/4"
X X		X X	X X	X X	X X X	X SEE TAMKO X	X X X	X X	X*	X*	X*	X*
X CELLULAR GLASS	ALWAYS USE WITH PARADIENE 20 AS A SYSTEM	X CELLULAR GLS ALWAYS USE W/FG BASE SH AS A SYSTEM	X ALWAYS USE WITH PARADIENE 30 AS A SYSTEM	X ALWAYS USE WITH IREX-XP AS A SYSTEM	X X	X SEE TAMKO X CELLULAR GLASS	X X X X	X X	X X* X* OVERLAYMENT REQUIRED	X X* X* OVERLAYMENT REQUIRED	X X* X* OVERLAYMENT REQUIRED	X X* X* OVERLAYMENT REQUIRED
					5 F-125 F	NONE SEE TAMKO	ALASKA 0 F-130 F	0 F-120 F	NONE SEE TREMCO	NONE SEE TREMCO	NONE SEE TREMCO	NONE SEE TREMCO
SAME/VERAL	VERAL	VERAL	VERAL	VERAL	SAME MATERIAL	SAME MATL OR VERSA-FLASH	SAME MATERIAL	SAME MATERIAL	SEE TREMCO	SEE TREMCO	SEE TREMCO	SEE TREMCO
TORCH	TORCH	TORCH	TORCH	TORCH	TORCH	HOT ASPHALT/ TORCH	TORCH	TORCH	SEE TREMCO	SEE TREMCO	SEE TREMCO	SEE TREMCO
UNNECESSARY	UNNECESSARY	UNNECESSARY	UNNECESSARY	UNNECESSARY	UNNECESSARY	UNNECESSARY	NO	NO	X	X	X	X
FRANCE FRANCE	FRANCE USA	FRANCE USA	FRANCE USA	FRANCE USA	USA	W GERMANY USA	ITALY USA & ITALY	ITALY USA	AUSTRIA USA	AUSTRIA USA	AUSTRIA USA	AUSTRIA USA
	1968 1979- JACKSONVILLE	1968 1979- JACKSONVILLE			1963 1981- FORT WORTH	1970 1978- GRAND RAPIDS	1970 1977- WESTCHESTER	1961 1981- FORT WORTH	1972 1984	1972 1984	1972 1984	1972 1984
					100'S OF M'S	NOT AVAIL NOT REPT'D	MILLIONS 100'S OF M'S	1,000 THOUSANDS				
10 NO X	10 NO X	10 NO X	10 NO X	10 NO X	12 YES X X	10 NO X	10 OR 5 X X	12 NO X	10 X	10 X	10 X	10 X
X	X	X		X	YES X X	250	X		X	X	X	X
X X	X X	X X	X X	X X	X X	X	X X	X X	X X	X X	X X	X X
SEE SIPLAST	SEE SIPLAST	SEE SIPLAST	SEE SIPLAST	SEE SIPLAST	SEE SWEPCO	SEE TAMKO		CONTACT TRC	SEE TREMCO	SEE TREMCO	SEE TREMCO	SEE TREMCO
DIRECT 5 YES	DIRECT 5 YES	DIRECT 5 YES	DIRECT 5 YES	DIRECT 5 YES	DIRECT EVERY STATE	DISTRS 10 X	DISTRS 35 YES	SALES FORCE USA/CANADA YES	LOCAL SALES REPS 18 YES	LOCAL SALES REPS 18 YES	LOCAL SALES REPS 18 YES	LOCAL SALES REPS 18 YES
FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS, FACTORY	SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS, FACTORY
J MOLLENHOFF BAUMGARDNER	J MOLLENHOFF BAUMGARDNER	J MOLLENHOFF BAUMGARDNER	J MOLLENHOFF BAUMGARDNER	J MOLLENHOFF BAUMGARDNER	J ASHWORTH R NIMRI	P DANIELS K BLANCHARD	G ROWBOTHAM M BOCKH	L GROCE J M MCGEE	P MITCHELL K BRZOZOWSKI	P MITCHELL K BRZOZOWSKI	P MITCHELL K BRZOZOWSKI	P MITCHELL K BRZOZOWSKI
35	36	36	36	36	36	36	36	36	36	36	36	36

MODIFIED BITUMENS Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	TRI-PLY INC	TROPICAL INDUSTRIAL COATINGS, INC	U S INTEC, INC	W R GRACE & CO	W R GRACE & CO	W R GRACE & CO	W R GRACE & CO
2. PRODUCT NAME	TP-4	TROPISEAL	BRAI SP4	GRM-120	GRM-230	GRM-350	GRM-500
3. PRODUCT DESCRIPTION:							
A. TYPE OF BITUMEN MODIFIER							
B. THICKNESS (MILS)	150	157	150	50	50	50	40
C. TOP SURFACE	MODIFIED BITUMEN	MOD BITUMEN	MOD BITUMEN	POLYETHYLENE	POLYETHYLENE	POLYETHYLENE	POLYVINYL FLORIDE
D. REINFORCEMENT MATERIAL	POLYESTER	NON-WOVEN POLYESTER	POLYESTER	ALUM FOIL			POLYETHYLENE ALUM FOIL
E. COLOR	BLACK	GREY/BLACK	BLACK	GRAY/BLACK	GRAY/BLACK	GRAY/BLACK	WHITE
F. INSTALLED WT (lbs/ft² W/O BALLAST)	.88	.88	.88	.34	.34	.34	.30
4. COATING REQUIRED	YES	RECOMMENDED, NOT REQ'D	ALUMINUM	WHITE	GRAVEL	INSUL BOARD	NONE
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X
B. REROOFING	X	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD	TORCH	TORCH	TORCH	SELF-ADHESIVE	SELF-ADHESIVE	SELF-ADHESIVE	SELF-ADHESIVE
7. TYPE OF ROOF SYSTEM:							
A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)	X	10					
B. PARTIALLY ADHERED (METHOD)		TORCH		NAILED LAPS	NAILED LAPS		NAILED LAPS
C. FULLY ADHERED (METHOD)	X	TORCH	TORCH	SLF-ADHESIVE	SLF-ADHESIVE	SLF-ADHESIVE	SLF-ADHESIVE
D. PROTECTED MEMBRANE ROOFING ASSEMBLY						SLF-ADHESIVE	
8. MINIMUM SLOPE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	TO DRAIN	TO DRAIN	TO DRAIN	TO DRAIN
9. USE OVER:							
A. PERLITE	X	X	X	X	X		X
B. POLYURETHANE	X	X	X				
C. WOOD FIBER	X	X*	X	X	X		X
D. GLASS FIBER	X	X	X	X	X		X
E. EXPANDED POLYSTYRENE	X	X*	X	X	X		X
F. FELT FACED COMPOSITES	X	X	X				
G. OTHER	BASE SHEET REQUIRED OVER ALL INSULATIONS	BASE SHEET OVER NON-FACED INSULATION		ISOCYANURATE FOAMED GLASS	ISOCYANURATE FOAMED GLASS	CONCRETE, GYPSUM, PLYWOOD	ISOCYANURATE FOAMED GLASS
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE
11. WORKABLE TEMPERATURE RANGE	0 F-120 F	0 F-125 F	0 F-120 F	40 F-120 F	40 F-120 F	40 F-120 F	40 F-120 F
12. FLASHING MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	SAME MATERIAL	GRM-120 OR GRM-500	SAME MATL
13. FLASHING METHOD	TORCH	TORCH	TORCH	SELF-ADHESIVE	SELF-ADHESIVE	SELF-ADHESIVE	SELF-ADHESIVE
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	NO	UNNECESSARY	NO	NO	NO	NO	NO
15. COUNTRY: A. ORIGIN	USA	ITALY	ITALY	USA	USA	USA	USA
B. MANUFACTURE	USA	USA	USA	USA	USA	USA	USA
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)		1965	1961			1971-TORONTO	
B. USA (YEAR)(CITY FIRST INSTALLED)	DETROIT	1979-MICHIGAN	1978-DETROIT	1979-PHOENIX	1975-TOLEDO	1972-BOSTON	1980-GLENVIEW
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN			10,000,000				
B. USA	150,000+		<700,000	>250,000	>250,000	<250,000	<250,000
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)							
A. DURATION (YEARS)	12	5 OR 10	12	10	10	10	10
B. RENEWABLE AFTER INSPECTION (YES/NO)	NO	NO	NO				
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY							
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE	X	X	X	X		X	X
D.2 ORIG. COST OF INSTALT'N							
D.3 $ PER SQUARE							
E. EXCLUSION FROM COVERAGE							
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE	SEE TRI-PLY	SEE APPENDIX				ONLY PRMA SYSTEMS	
20. METHOD OF DISTRIBUTION	DISTRIBUTORS	SALES FORCE/ DISTRS	DISTRS	DIRECT SALE	DIRECT SALE	DIRECT SALE	DIRECT SALE
21. NUMBER OF REGIONAL LOCATIONS	50	4	12	5	5	5	5
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES	YES	YES	YES	YES	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FIELD, SEMINARS	FIELD, SEMINARS	SEMINARS, FACTORY	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS
24. SALES INFORMATION CONTACT	J RIZZO	TROPICAL	B KING	REGIONAL OFF	REGIONAL OFF	REGIONAL OFF	REGIONAL OFF
25. TECHNICAL INFORMATION CONTACT	JERRY KJERRUMGAARD	TROPICAL	C NOBLE	REGIONAL OFF	REGIONAL OFF	REGIONAL OFF	REGIONAL OFF
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	36	36	36	36	36	36	36

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MODIFIED BITUMENS Part 2: Test Results *(See Part 1 for General Information)*

Test Description and Suggested Values As Specified in CGSB Standard 37-GP-56M

1. COMPANY NAME	ALLROOF INTERNAT'L INC	ALLROOF INTERNAT'L INC	ALLROOF INTERNAT'L INC	ALLROOF INTERNAT'L INC	ALLROOF INTERNAT'L INC	THE AMERICAN LUBRICANTS COMPANY	AMERICAN ROOFING CORP	AMERICAN ROOFING CORP	AMERICAN ROOFING CORP
2. PRODUCT NAME	BELROOF SD-4	BELROOF SD-4M	BELROOF SBS-4	BELROOF SBS-4M	ALLROOF POLYPREN	TIFFANY	ARC ALUMINUM	ARC PREMIUM	ARC GRANULAR
3. TYPE 4. CLASS 5. GRADE	TYPE CLASS GRADE 2A C 2	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE 2A C 2	TYPE CLASS GRADE 1A,2A B 1	TYPE CLASS GRADE 1A,2A C 1&2	TYPE CLASS GRADE 1A,2A A 1&2
6. BREAKING STRENGTH: GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD)	MD NA XD NA MD 208 XD 180.4	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD NA XD NA MD 208 XD 180.4	MD 106 XD 71 MD 106 XD 71	MD 164 XD 134 MD 164 XD 134	MD 158 XD 124 MD 158 XD 124
7. ULTIMATE ELONGATION: GRADE 1 MIN. 4.0%(MD/XD) GRADE 2 MIN. 8.0%(MD/XD)	MD NA XD NA MD 72.38 XD 64.76	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD NA XD NA MD 72.38 XD 64.76	MD 40 XD 38 MD 40 XD 38	MD 58 XD 81 MD 58 XD 81	MD 89 XD 106 MD 89 XD 106
8. LOAD STRAIN PRODUCT (BREAK STRENGTH(lbf) × ULTIMATE ELONGATION (%)): GRADE 1 IF BREAKING STRENGTH IS NOT MET; 19400 GRADE 1 IF BREAKING STRENGTH IS MET; 2940 GRADE 2 MIN. 14700	NA NA ___	___ ___ ___	___ ___ ___	___ ___ ___	___ ___ ___	NA NA 66,968	NA 18,840 18,840	NA 42,300 42,300	NA 62,600 62,600
9. WATER RESISTANCE NOT MORE THAN 1.0g DIMENSION CHG NOT MORE THAN ± 1.0%(MD/XD)	0.0 MD 1.0 XD 1.0	___ MD ___ XD ___	___ MD ___ XD ___	___ MD ___ XD ___	___ MD ___ XD ___	0.0 MD 1.0 XD 1.0	<1.0 MD <1.0 XD <1.0	<1.0 MD <1.0 XD <1.0	<1.0 MD <1.0 XD <1.0
10. LOW TEMP FLEXIBILITY: TYPE 1 @ –22°F(PASS/FAIL) TYPE 2 @ –14°F(PASS/FAIL)	NA PASS	___ ___	___ ___	___ ___	___ ___	NA PASS	PASS PASS	PASS PASS	PASS PASS
11. WATER VAPOR TRANSMISSION MAX. 10g/m² × 24 hr.	0.06	___	___	___	___	0.06	0.132	0.132	0.132
12. THERMAL STABILITY: TYPE 1, CLASS B ONLY LESS THAN 10mm/m	NA	___	___	___	___	NA	___	NA	NA
13. DYNAMIC IMPACT (PUNCTURING), WATER TIGHTNESS: GRADE 1 AFTER IMPACT OF 18 ft lbf(PASS/FAIL) GRADE 2 AFTER IMPACT OF 36 ft lbf(PASS/FAIL)	NA PASS	___ ___	___ ___	___ ___	___ ___	NA PASS	PASS NA	PASS PASS	PASS PASS
14. STATIC PUNCTURING: TYPE 1 WATER TIGHTNESS AFTER 1 hr. @ 55 lbf(PASS/FAIL)	PASS	___	___	___	___	PASS	PASS	PASS	PASS
15. LAP JOINT STRENGTH (5 DAY CONDITIONING): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD NA XD NA MD 166.32 XD ___ PASS	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD NA XD NA MD 166.32 XD ___ PASS	MD 84 XD 76 MD 84 XD 76 PASS	MD 128 XD 104 MD 128 XD 104 PASS	MD 168 XD 130 MD 168 XD 130 PASS
16. LAP JOINT STRENGTH (IMMERSION @ 50°C FOR 5 DAYS): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD NA XD NA MD 176.8 XD ___ PASS	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD NA XD NA MD 176.8 XD ___ PASS	MD 99 XD 73 MD 99 XD 73 PASS	MD 155 XD 137 MD 155 XD 137 PASS	MD 140 XD 123 MD 140 XD 123 PASS
17. LAP JOINT STRENGTH (IMMERSION @ 50°C, 5 DAYS + FREEZE THAW): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD NA XD NA MD 175.48 XD ___ PASS	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD NA XD NA MD 175.48 XD ___ PASS	MD 95 XD 63 MD 95 XD 63 PASS	MD 155 XD 129 MD 155 XD 129 PASS	MD 164 XD 127 MD 164 XD 127 PASS
18. GRANULE EMBEDMENT: CLASS A ONLY MAX. 0.5g LOSS	NA	___	___	___	___	NA	NA	NA	0.1G/CM2
19. ACCELERATED WEATHERING: TYPE 1 ONLY NO CRACKING OR BLISTERING (PASS/FAIL) RETAIN 90% OF BREAKING STRENGTH (#6)(MD/XD) RETAIN 90% OF ELONGATION AT BREAK (#1)(MD/XD)	PASS MD 92 XD 92 MD 66.15 XD 59.58	___ MD ___ XD ___ MD ___ XD ___	___ MD ___ XD ___ MD ___ XD ___	___ MD ___ XD ___ MD ___ XD ___	___ MD ___ XD ___ MD ___ XD ___	PASS MD 92 XD 92 MD 91 XD 92	___ MD ___ XD ___ MD ___ XD ___	___ MD ___ XD ___ MD ___ XD ___	___ MD ___ XD ___ MD ___ XD ___
20. CRACK BRIDGING CAPABILITY (NO CRACKING, SPLITTING OR LOSS OF ADHESION): TYPE 1A and 1B AT –22°F (PASS/FAIL) TYPE 2.A and 2.B AT –14°F (PASS/FAIL)	NA PASS	___ ___	___ ___	___ ___	___ ___	NA PASS	___ ___	___ ___	___ ___
21. FOR GENERAL INFORMATION SEE PG(s)	22	22	22	22	22	22	22	22	22

22. LEGEND: NA = NOT APPLICABLE; MD = MACHINE DIRECTION; XD = CROSS MACHINE DIRECTION; BLANK LINES = APPLICABLE DATA NOT SUPPLIED BY MANUFACTURER

1. COMPANY NAME	APACHE BUILDING PRODUCTS COMPANY	BARRA CORP OF AMERICA INC	BARRA CORP OF AMERICA INC	BARRA CORP OF AMERICA INC	THE BARRETT COMPANY	THE BARRETT COMPANY	THE BARRETT COMPANY	BOWE CO INC (DIBITEN)	BOWE CO INC (DIBITEN)
2. PRODUCT NAME	SAM	MODI SHIELD PR	MODI SHIELD GR	MODI SHIELD AL	SHELL CARIPHALTE FR 200	SHELL CARIPHALTE FR 306	SHELL CARIPHALTE	DIBITEN POLY-5	DIBITEN POLY-4
3. TYPE 4. CLASS 5. GRADE	TYPE CLASS GRADE 1A,2A C 1	TYPE CLASS GRADE 1A,2A C 1&2	TYPE CLASS GRADE 1A,2A A 1&2	TYPE CLASS GRADE 1A,2A B 1	TYPE CLASS GRADE 2A C 2	TYPE CLASS GRADE 1A A 1	TYPE CLASS GRADE — — —	TYPE CLASS GRADE 1A,2A C 2	TYPE CLASS GRADE 1A,2A C 2
6. BREAKING STRENGTH: GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD)	MD 108.9 XD 122.6 MD NA XD NA	MD 164 XD 134 MD 164 XD 134	MD 158 XD 124 MD 158 XD 124	MD 106 XD 71 MD 106 XD 71	MD NA XD NA MD 302 XD 240	MD 110.5 XD 92.5 MD NA XD NA	MD ___ XD ___ MD ___ XD ___	MD NA XD NA MD ___ XD ___	MD NA XD NA MD 208 XD 180.4
7. ULTIMATE ELONGATION: GRADE 1 MIN. 4.0%(MD/XD) GRADE 2 MIN. 8.0%(MD/XD)	MD 64.9 XD 59.3 MD NA XD NA	MD 58 XD 81 MD 58 XD 81	MD 89 XD 106 MD 89 XD 106	MD 40 XD 38 MD 40 XD 38	MD NA XD NA MD 38 XD 45	MD 7.6 XD 7.6 MD NA XD NA	MD ___ XD ___ MD ___ XD ___	MD NA XD NA MD 50 XD 50	MD NA XD NA MD 48 XD 48
8. LOAD STRAIN PRODUCT (BREAK STRENGTH(lbf) × ULTIMATE ELONGATION (%)): GRADE 1 IF BREAKING STRENGTH IS NOT MET; 19400 GRADE 1 IF BREAKING STRENGTH IS MET; 2940 GRADE 2 MIN. 14700	NA 32,385 NA	NA 42,300 42,300	NA 62,600 62,600	NA 18,840 18,840	NA NA 51,110	NA 3,739 NA	— ___ —	NA NA ___	NA NA ___
9. WATER RESISTANCE NOT MORE THAN 1.0g DIMENSION CHG NOT MORE THAN ± 1.0%(MD/XD)	0.3 MD 0.5 XD 0.6	<1.0 MD <1.0 XD <1.0	<1.0 MD <1.0 XD <1.0	<1.0 MD <1.0 XD <1.0	.6 MD .02 XD .13	.35 MD .0 XD .5	— MD ___ XD ___	0.0 MD 0.8 XD 0.8	0.0 MD 1.0 XD 1.0
10. LOW TEMP FLEXIBILITY: TYPE 1 @ –22°F(PASS/FAIL) TYPE 2 @ –14°F(PASS/FAIL)	___ NA	PASS PASS	PASS PASS	PASS PASS	NA PASS	PASS NA	___ ___	FASS	FASS
11. WATER VAPOR TRANSMISSION MAX. 10g/m² × 24 hr.	0.69	0.132	0.132	0.132	.11	.129	___	0.062	0.062
12. THERMAL STABILITY: TYPE 1, CLASS B ONLY LESS THAN 10mm/m	NA	NA	NA	___	NA	NA	___	NA	NA
13. DYNAMIC IMPACT (PUNCTURING), WATER TIGHTNESS: GRADE 1 AFTER IMPACT OF 18 ft lbf(PASS/FAIL) GRADE 2 AFTER IMPACT OF 36 ft lbf(PASS/FAIL)	PASS NA	PASS PASS	PASS PASS	PASS NA	NA ___	PASS NA	___ ___	NA PASS	NA PASS
14. STATIC PUNCTURING: TYPE 1 WATER TIGHTNESS AFTER 1 hr. @ 55 lbf(PASS/FAIL)	PASS	PASS	PASS	PASS	NA	NA	___	PASS	PASS
15. LAP JOINT STRENGTH (5 DAY CONDITIONING): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD 68.8 XD 77.6 MD NA XD NA ___	MD 128 XD 104 MD 128 XD 104 PASS	MD 168 XD 130 MD 168 XD 130 PASS	MD 84 XD 76 MD 84 XD 76 PASS	MD NA XD NA MD 399 XD ___ PASS	MD 87.5 XD ___ MD NA XD NA PASS	MD ___ XD ___ MD ___ XD ___ ___	MD NA XD NA MD 178.5 XD ___ PASS	MD NA XD NA MD 171.8 XD ___ PASS
16. LAP JOINT STRENGTH (IMMERSION @ 50°C FOR 5 DAYS): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD 85.1 XD 86.8 MD NA XD NA ___	MD 155 XD 137 MD 155 XD 137 PASS	MD 140 XD 123 MD 140 XD 123 PASS	MD 99 XD 73 MD 99 XD 73 PASS	MD NA XD NA MD 213 XD ___ PASS	MD 78 XD ___ MD NA XD NA PASS	MD ___ XD ___ MD ___ XD ___ ___	MD NA XD NA MD 185.6 XD ___ PASS	MD NA XD NA MD 177.3 XD ___ PASS
17. LAP JOINT STRENGTH (IMMERSION @ 50°C, 5 DAYS + FREEZE THAW): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD ___ XD ___ MD NA XD NA ___	MD 155 XD 129 MD 155 XD 129 PASS	MD 164 XD 127 MD 164 XD 127 PASS	MD 95 XD 63 MD 95 XD 63 PASS	MD NA XD NA MD 214 XD ___ PASS	MD 74 XD NA MD NA XD NA PASS	MD ___ XD ___ MD ___ XD ___ ___	MD NA XD NA MD 188.4 XD ___ PASS	MD NA XD NA MD 174.9 XD ___ PASS
18. GRANULE EMBEDMENT: CLASS A ONLY MAX. 0.5g LOSS	NA	NA	.01G/CM2	NA	NA	NA	___	NA	NA
19. ACCELERATED WEATHERING: TYPE 1 ONLY NO CRACKING OR BLISTERING (PASS/FAIL) RETAIN 90% OF BREAKING STRENGTH (#6)(MD/XD) RETAIN 90% OF ELONGATION AT BREAK (#1)(MD/XD)	PASS MD ___ XD ___ MD ___ XD ___	___ MD ___ XD ___ MD ___ XD ___	___ MD ___ XD ___ MD ___ XD ___	___ MD ___ XD ___ MD ___ XD ___	NA MD ___ XD ___ MD ___ XD ___	PASS MD 114 XD ___ MD 94.7 XD ___	___ MD ___ XD ___ MD ___ XD ___	PASS MD 190.1 XD 166.0 MD 65.9 XD 59.35	PASS MD 190.1 XD 166.0 MD 65.9 XD 59.4
20. CRACK BRIDGING CAPABILITY (NO CRACKING, SPLITTING OR LOSS OF ADHESION): TYPE 1A and 1B AT –22°F (PASS/FAIL) TYPE 2.A and 2.B AT –14°F (PASS/FAIL)	___ NA	___ ___	___ ___	___ ___	NA PASS	PASS NA	___ ___	FASS	FASS
21. FOR GENERAL INFORMATION SEE PG(s)	22	23	23	23	23	23	23	23	23

22. LEGEND: NA = NOT APPLICABLE; MD = MACHINE DIRECTION; XD = CROSS MACHINE DIRECTION; BLANK LINES = APPLICABLE DATA NOT SUPPLIED BY MANUFACTURER

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MODIFIED BITUMENS Part 2: Test Results *(See Part 1 for General Information)*

Test Description and Suggested Values As Specified in CGSB Standard 37-GP-56M

BOWE CO INC (DIBITEN)	CENTRAL SOYA COMPANY INC	CENTRAL SOYA COMPANY INC	CENTRAL SOYA COMPANY INC	CENTRAL SOYA COMPANY INC	CENTRAL SOYA COMPANY INC	CENTRAL SOYA COMPANY INC	CIRO ROOFING PRODUCTS USA INC	CIRO ROOFING PRODUCTS USA INC	CIRO ROOFING PRODUCTS USA INC	CIRO ROOFING PRODUCTS USA INC
DIBITEN POLY-4.5 GRANULAR	COLFLEX TORCH-ON	COLFLEX MINERAL TORCH-ON	POLROOF MAXIMUM	POLROOF MAXIMUM MINERAL	PERFO TORCH	COLROOF	CSP-4000 APP	CSP-4500 APP	CSV-4000 ALV-APP	CSP-4000 SBS
TYPE CLASS GRADE 1A A 2	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —
MD NA XD NA MD 208 XD 180.4	MD — XD — MD 1000 XD 1000	MD — XD — MD — XD —	MD 700 XD 600 MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD 750 XD 650 MD — XD —	MD 164 XD 134 MD — XD —	MD 158 XD 124 MD — XD —	MD 106 XD 71 MD — XD —	MD 164 XD 134 MD — XD —
MD NA XD NA MD 48 XD 48	MD — XD — MD 50 XD 50	MD — XD — MD — XD —	MD — XD — MD 40 XD 40	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD 35 XD 35	MD 58 XD 81 MD — XD —	MD 89 XD 106 MD — XD —	MD 40 XD 38 MD — XD —	MD 50 XD 50 MD — XD —
NA NA —	— — 50,000	— — —	— — 28,000	— — —	— — —	— — 26,250	42,300 — —	62,600 — —	18,840 — —	42,300 — —
0.0 MD 1.0 XD 1.0	0.0 MD <1.0 XD <1.0		0.0 MD <1.0 XD <1.0			0.0 MD <1.0 XD <1.0	<1G MD — XD —	<1G MD — XD —	<1G MD — XD —	<1 MD — XD —
NA	PASS —	— —	FAIL PASS	— —	— —	FAIL FAIL	PASS —	PASS —	PASS —	PASS PASS
0.062	0.02	—	0.02	—	—	0.02	.132	.132	.132	.132
NA	—	—	—	—	—	—	—	—	—	—
NA PASS	— —	— —	— —	— —	— —	— —	PASS —	PASS —	PASS —	PASS PASS
PASS	—	—	—	—	—	—	PASS	PASS	PASS	PASS
MD NA XD NA MD 171.8 XD — PASS	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD 104 XD — MD 104 XD — PASS	MD 130 XD — MD 130 XD — PASS	MD 76 XD — MD 76 XD — —	MD 104 XD — MD 104 XD — PASS
MD NA XD NA MD 177.3 XD — PASS	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD 137 XD — MD 137 XD — PASS	MD 123 XD — MD 123 XD — PASS	MD 73 XD — MD 73 XD — PASS	MD 137 XD — MD 137 XD — PASS
MD NA XD NA MD 174.9 XD — PASS	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD — XD — MD — XD — —	MD 129 XD — MD 129 XD — PASS	MD 123 XD — MD 123 XD — PASS	MD 63 XD — MD 63 XD — PASS	MD 129 XD — MD 129 XD — PASS
0.1	—	—	—	—	—	—	NA	0.5/GR	NA	NA
PASS MD 190.1 XD 166.0 MD 65.9 XD 59.4	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —
— PASS	PASS —	— —	— PASS	— —	— —	— —	— —	— —	— —	— —
23	23	23	23	23	24	24	24	24	24	24

CIRO ROOFING PRODUCTS USA INC	CONS PROT COATINGS CORP	CONS PROT COATINGS CORP	DANOSA CARIBBEAN INC	DANOSA CARIBBEAN INC	DANOSA CARIBBEAN INC	DANOSA CARIBBEAN INC	FLEX-SHIELD CORP	FLEX-SHIELD CORP	THE GARLAND CO INC	THE GARLAND CO INC
CSP-4500 SBS	CONSO-GARD	CONSO-GARD II	GLASDAN R36	ESTERDAN R-36	GLASDAN AL-80	ESTERDAN RM	F.A.R. MARK II	FLEX-SHIELD MARK IV	STRESSPLY	PITCHPLY
TYPE CLASS GRADE — — —	TYPE CLASS GRADE 1AB,2ABC C 1	TYPE CLASS GRADE 1AB,2ABC C 2	TYPE CLASS GRADE 2A C 1	TYPE CLASS GRADE 2A C 2	TYPE CLASS GRADE 1A B 1	TYPE CLASS GRADE 1A A 2	TYPE CLASS GRADE — — 1	TYPE CLASS GRADE — — 2	TYPE CLASS GRADE — C 1&2	TYPE CLASS GRADE — C 1&2
MD 158 XD 124 MD — XD —	MD 67.2 XD 44.8 MD NA XD NA	MD NA XD NA MD — XD —	MD — XD — MD NA XD NA	MD NA XD NA MD — XD —	MD — XD — MD NA XD NA	MD NA XD NA MD — XD —	MD 108.9 XD 122.6 MD NA XD NA	MD NA XD NA MD 208 XD 180	MD 318 XD 324 MD 318 XD 324	MD 247 XD 157 MD 247 XD 157
MD 50 XD 50 MD — XD —	MD 35 XD — MD NA XD NA	MD NA XD NA MD — XD —	MD — XD — MD NA XD NA	MD NA XD NA MD — XD —	MD — XD — MD NA XD NA	MD NA XD NA MD — XD —	MD 64.9 XD 59.3 MD NA XD NA	MD NA XD NA MD 72.4 XD 64.8	MD 340 XD 240 MD 340 XD 240	MD 100 XD 120 MD 100 XD 120
62,600 — —	— — NA	NA NA —	— — NA	NA NA —	— — NA	NA NA —	NA 32,385 NA	NA NA —	NA 14,170 14,170	NA 132,000 —
MD — XD —	NIL MD NIL XD NIL	MD — XD —	MD — XD —	MD — XD —	MD — XD —	MD — XD —	.3 MD .5 XD .6	0.0 MD 1.0 XD 1.0	MD — XD —	0.051 MD -0.5 XD 0.0
PASS PASS	PASS —	— PASS	NA PASS	NA PASS	PASS NA	— PASS	— NA	NA PASS	— —	— —
.132	—	—	0.024	0.065	0.024	0.065	.69	.06	—	0.5
—	—	—	NA	NA	NA	NA	NA	NA	NA	NA
PASS PASS	PASS NA	NA PASS	— PASS	NA PASS	— PASS	NA PASS	PASS NA	NA PASS	— —	— —
PASS	PASS	PASS	NA	NA	—	NA	PASS	PASS	—	—
MD 130 XD — MD 130 XD — PASS	MD — XD — MD NA XD NA —	MD NA XD NA MD — XD — —	MD — XD — MD NA XD NA PASS	MD NA XD NA MD — XD — PASS	MD — XD — MD NA XD NA PASS	MD NA XD NA MD — XD — PASS	MD 68.8 XD 77.6 MD NA XD NA —	MD NA XD NA MD 166 XD — PASS	MD — XD — MD — XD — —	MD — XD — MD — XD — —
MD 123 XD — MD 123 XD — PASS	MD — XD — MD NA XD NA —	MD NA XD NA MD — XD — —	MD — XD — MD NA XD NA PASS	MD NA XD NA MD — XD — PASS	MD — XD — MD NA XD NA PASS	MD NA XD NA MD — XD — PASS	MD 85.1 XD 86.8 MD NA XD NA —	MD NA XD NA MD 176 XD — PASS	MD — XD — MD — XD — —	MD — XD — MD — XD — —
MD 127 XD — MD 127 XD — PASS	MD — XD — MD NA XD NA —	MD NA XD NA MD — XD — —	MD — XD — MD NA XD NA PASS	MD NA XD NA MD — XD — PASS	MD — XD — MD NA XD NA PASS	MD NA XD NA MD — XD — PASS	MD — XD — MD NA XD NA —	MD NA XD NA MD 175 XD — PASS	MD — XD — MD — XD — —	MD — XD — MD — XD — —
0.5	NA	NA	NA	NA	NA	—	NA	NA	NA	NA
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	PASS MD NA XD NA MD NA XD NA	PASS MD NA XD NA MD NA XD NA	PASS MD — XD — MD — XD —	PASS MD — XD — MD — XD —	PASS MD — XD — MD — XD —	PASS MD 92 XD 92 MD 66 XD 59	PASS MD — XD — MD — XD —	PASS MD — XD — MD — XD —
— —	— —	— —	— NA	— NA	— NA	— NA	— NA	NA PASS	— —	— —
24	24	24	24	25	25	25	25	25	25	25

MODIFIED BITUMENS Part 2: Test Results *(See Part 1 for General Information)*

Test Description and Suggested Values As Specified in CGSB Standard 37-GP-56M

1. COMPANY NAME	THE GARLAND CO INC	GEDACO LTD (ITALY)	GEDACO LTD (ITALY)	GEDACO LTD (ITALY)	GEDACO LTD (ITALY)	GEDACO LTD (ITALY)	GEDACO LTD (ITALY)	GENSTAR	GUAINA
2. PRODUCT NAME	GARLAPLY	GEDAGOM POLYESTER CONT FILAMENT	GEDAGOM POLYESTER	GEDAGOM VELO VETRO	GEDAGOM VELO VETRO EXTRA	GEDAGOM GRANIPOL	GEDAGOM GRANIVEL	FLINTLASTIC	GUAINA POLYGLASS
3. TYPE 4. CLASS 5. GRADE	TYPE CLASS GRADE 1A,2A C 1	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — C —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE 1A A 1	TYPE CLASS GRADE 1A,2A C 1&2
6. BREAKING STRENGTH: GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD)	MD 281 XD 186 MD 281 XD 186	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD 177 XD 150 MD NA XD NA	MD 162 XD 132 MD 162 XD 132
7. ULTIMATE ELONGATION: GRADE 1 MIN. 4.0%(MD/XD) GRADE 2 MIN. 8.0%(MD/XD)	MD 64 XD 62 MD 64 XD 62	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD 4.35 XD 4.0 MD NA XD NA	MD 56 XD 80 MD 56 XD 80
8. LOAD STRAIN PRODUCT (BREAK STRENGTH(lbf) × ULTIMATE ELONGATION (%)): GRADE 1 IF BREAKING STRENGTH IS NOT MET; 19400 GRADE 1 IF BREAKING STRENGTH IS MET; 2940 GRADE 2 MIN. 14700	NA 51,590 51,590	___ ___ ___	___ ___ ___	___ ___ ___	___ ___ ___	___ ___ ___	___ ___ ___	NA 3,466 NA	NA 42,200 42,200
9. WATER RESISTANCE NOT MORE THAN 1.0g DIMENSION CHG NOT MORE THAN ± 1.0%(MD/XD)	MD ___ XD ___	MD ___ XD ___	MD ___ XD ___	MD ___ XD ___	MD ___ XD ___	MD ___ XD ___	MD ___ XD ___	0.5 MD 0.0 XD 0.0	<1.0 MD <1.0 XD <1.0
10. LOW TEMP FLEXIBILITY: TYPE 1 @-22°F(PASS/FAIL) TYPE 2 @-14°F(PASS/FAIL)	___ ___	___ ___	___ ___	___ ___	___ ___	___ ___	___ ___	PASS PASS	PASS PASS
11. WATER VAPOR TRANSMISSION MAX. 1.0g/m² × 24 hr.	___	___	___	___	___	___	___	0.51	0.132
12. THERMAL STABILITY: TYPE 1, CLASS B ONLY LESS THAN 1.0mm/m	___	___	___	___	___	___	___	NA	NA
13. DYNAMIC IMPACT (PUNCTURING), WATER TIGHTNESS: GRADE 1 AFTER IMPACT OF 1.8 ft lbf(PASS/FAIL) GRADE 2 AFTER IMPACT OF 3.6 ft lbf(PASS/FAIL)	___ ___	___ ___	___ ___	___ ___	___ ___	___ ___	___ ___	PASS NA	PASS PASS
14. STATIC PUNCTURING: TYPE 1 WATER TIGHTNESS AFTER 1 hr. @ 55 lbf(PASS/FAIL)	___	___	___	___	___	___	___	PASS	PASS
15. LAP JOINT STRENGTH (5 DAY CONDITIONING): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD 140 XD 100 MD NA XD NA PASS	MD 126 XD 102 MD 126 XD 102 PASS
16. LAP JOINT STRENGTH (IMMERSION @ 50°C FOR 5 DAYS): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD 130 XD 90 MD NA XD NA PASS	MD 153 XD 135 MD 153 XD 135 PASS
17. LAP JOINT STRENGTH (IMMERSION @ 50°C, 5 DAYS + FREEZE THAW): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD 130 XD 90 MD NA XD NA PASS	MD 153 XD 127 MD 153 XD 127 PASS
18. GRANULE EMBEDMENT: CLASS A ONLY MAX. 0.5g LOSS	___	___	___	___	___	___	___	0.1	NA
19. ACCELERATED WEATHERING: TYPE 1 ONLY NO CRACKING OR BLISTERING (PASS/FAIL) RETAIN 90% OF BREAKING STRENGTH (#6)(MD/XD) RETAIN 90% OF ELONGATION AT BREAK (#1)(MD/XD)	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	PASS MD 96 XD 95 MD 94 XD 92	MD ___ XD ___ MD ___ XD ___
20. CRACK BRIDGING CAPABILITY (NO CRACKING, SPLITTING OR LOSS OF ADHESION): TYPE 1.A and 1.B AT -22°F (PASS/FAIL) TYPE 2.A and 2.B AT -14°F (PASS/FAIL)	___ ___	___ ___	___ ___	___ ___	___ ___	___ ___	___ ___	PASS NA	___ ___
21. FOR GENERAL INFORMATION SEE PG(s)	25	25	25	25	25	25	26	26	26

22. LEGEND:NA = NOT APPLICABLE; MD = MACHINE DIRECTION; XD = CROSS MACHINE DIRECTION; BLANK LINES = APPLICABLE DATA NOT SUPPLIED BY MANUFACTURER

1. COMPANY NAME	GUAINA	GUAINA	GUAINA	GUAINA	HEY´DI UPM CORP	HITCHINS AMER INC	HYLOAD INC	INDEX SPA TECHOLOGIE IMPERMEABILI	INDEX SPA TECHOLOGIE IMPERMEABILI
2. PRODUCT NAME	GUAINA POLYGLASS ALUM	GUAINA POLYGLASS POLYESTER	GUAINA POLYGLASS GRANULAR	GUAINA POLYPREN ECB	HEY´DI ECB	NURALITE	HYLOAD 150E	TESTUDO 4	MINERAL TESTUDO 4,5
3. TYPE 4. CLASS 5. GRADE	TYPE CLASS GRADE 1A,2A B 1	TYPE CLASS GRADE 1A,2A C 1	TYPE CLASS GRADE 1A,2A A 1&2	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — A 1	TYPE CLASS GRADE 2A A 1&2	TYPE CLASS GRADE — — —	TYPE CLASS GRADE — — —
6. BREAKING STRENGTH: GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD)	MD 105 XD 70 MD 105 XD 70	MD 110 XD 478 MD 110 XD 478	MD 156 XD 122 MD 156 XD 122	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD NA XD NA	MD 250 XD 160 MD 250 XD 160	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___
7. ULTIMATE ELONGATION: GRADE 1 MIN. 4.0%(MD/XD) GRADE 2 MIN. 8.0%(MD/XD)	MD 39 XD 37 MD 39 XD 37	MD 36 XD 43 MD 36 XD 43	MD 87 XD 104 MD 87 XD 104	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD NA XD NA	MD 150 XD 150 MD 150 XD 150	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___
8. LOAD STRAIN PRODUCT (BREAK STRENGTH(lbf) × ULTIMATE ELONGATION (%)): GRADE 1 IF BREAKING STRENGTH IS NOT MET; 19400 GRADE 1 IF BREAKING STRENGTH IS MET; 2940 GRADE 2 MIN. 14700	NA 18,840 18,840	NA 18,765 18,765	NA 62,500 62,500	___ ___ ___	___ ___ ___	___ ___ NA	NA 166,000 166,000	___ ___ ___	___ ___ ___
9. WATER RESISTANCE NOT MORE THAN 1.0g DIMENSION CHG NOT MORE THAN ± 1.0%(MD/XD)	<1.0 MD <1.0 XD <1.0	<1.0 MD <1.0 XD <1.0	<1.0 MD <1.0 XD <1.0	MD ___ XD ___	MD ___ XD ___	MD ___ XD ___	0.051 MD 0.5 XD ___	MD ___ XD ___	MD ___ XD ___
10. LOW TEMP FLEXIBILITY: TYPE 1 @-22°F(PASS/FAIL) TYPE 2 @-14°F(PASS/FAIL)	PASS PASS	PASS PASS	PASS PASS	___ ___	___ ___	___ ___	NA PASS	___ ___	___ ___
11. WATER VAPOR TRANSMISSION MAX. 1.0g/m² × 24 hr.	0.132	0.132	0.132	___	___	___	0.5	___	___
12. THERMAL STABILITY: TYPE 1, CLASS B ONLY LESS THAN 1.0mm/m	___	NA	NA	___	___	NA	NA	___	___
13. DYNAMIC IMPACT (PUNCTURING), WATER TIGHTNESS: GRADE 1 AFTER IMPACT OF 1.8 ft lbf(PASS/FAIL) GRADE 2 AFTER IMPACT OF 3.6 ft lbf(PASS/FAIL)	PASS NA	PASS PASS	PASS PASS	___ ___	___ ___	___ NA	PASS ___	___ ___	___ ___
14. STATIC PUNCTURING: TYPE 1 WATER TIGHTNESS AFTER 1 hr. @ 55 lbf(PASS/FAIL)	PASS	PASS	PASS	___	___	___	PASS	___	___
15. LAP JOINT STRENGTH (5 DAY CONDITIONING): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD 82 XD 74 MD 82 XD 74 PASS	MD 166 XD 440 MD 166 XD 440 PASS	MD 166 XD 128 MD 166 XD 128 PASS	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD NA XD NA ___	MD ___ XD 176 MD ___ XD 176 ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___
16. LAP JOINT STRENGTH (IMMERSION @ 50°C FOR 5 DAYS): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD 97 XD 73 MD 97 XD 73 PASS	MD 142 XD 390 MD 142 XD 390 PASS	MD 138 XD 121 MD 138 XD 121 PASS	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD NA XD NA ___	MD ___ XD 158 MD ___ XD 158 ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___
17. LAP JOINT STRENGTH (IMMERSION @ 50°C, 5 DAYS + FREEZE THAW): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD 93 XD 61 MD 93 XD 61 PASS	MD 143 XD 400 MD 143 XD 400 PASS	MD 162 XD 125 MD 162 XD 125 PASS	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD NA XD NA ___	MD ___ XD 157 MD ___ XD 157 ___	MD ___ XD ___ MD ___ XD ___ ___	MD ___ XD ___ MD ___ XD ___ ___
18. GRANULE EMBEDMENT: CLASS A ONLY MAX. 0.5g LOSS	NA	NA	.01G/CM2	___	___	___	___	___	___
19. ACCELERATED WEATHERING: TYPE 1 ONLY NO CRACKING OR BLISTERING (PASS/FAIL) RETAIN 90% OF BREAKING STRENGTH (#6)(MD/XD) RETAIN 90% OF ELONGATION AT BREAK (#1)(MD/XD)	MD 17 XD 17 MD 17 XD 17	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	PASS MD NA XD NA MD NA XD NA	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___
20. CRACK BRIDGING CAPABILITY (NO CRACKING, SPLITTING OR LOSS OF ADHESION): TYPE 1.A and 1.B AT -22°F (PASS/FAIL) TYPE 2.A and 2.B AT -14°F (PASS/FAIL)	___ ___	___ ___	___ ___	___ ___	___ ___	___ ___	NA ___	___ ___	___ ___
21. FOR GENERAL INFORMATION SEE PG(s)	26	26	26	26	26	26	26	27	27

22. LEGEND:NA = NOT APPLICABLE; MD = MACHINE DIRECTION; XD = CROSS MACHINE DIRECTION; BLANK LINES = APPLICABLE DATA NOT SUPPLIED BY MANUFACTURER

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MODIFIED BITUMENS Part 2: Test Results *(See Part 1 for General Information)*

Test Description and Suggested Values As Specified in CGSB Standard 37-GP-56M

INDEX SPA TECHOLOGIE IMPERMEABILI	INDEX SPA TECHOLOGIE IMPERMEABILI	INDEX SPA TECHOLOGIE IMPERMEABILI	INDEX SPA TECHOLOGIE IMPERMEABILI	J & P PETROLEUM PRODUCTS	KELLY ENERGY SYSTEMS INC	THE KIMMENADE CORP	THE KIMMENADE CORP	HERBERT MALARKEY ROOFING CO	HERBERT MALARKEY ROOFING CO	NORD BITUMI US INC
HELASTA/P 4	MINERAL HELASTA P 4,5	DEFEND 4	MINERAL DEFEND 4,5	AQUASEL 2001 AD	SINGLE-STEP BUR	DURALASTA P	DURALASTA M	MHP POLYESTER CAP	MHP GLASS CAP	NORDPOLY 4B AAP
TYPE CLASS GRADE — – —	TYPE CLASS GRADE — – —	TYPE CLASS GRADE — – —	TYPE CLASS GRADE — – —	TYPE CLASS GRADE 2A C 1&2	TYPE CLASS GRADE 2A C 2	TYPE CLASS GRADE 2A,2B A 2	TYPE CLASS GRADE 2A,2B C 2	TYPE CLASS GRADE 1A A —	TYPE CLASS GRADE — – —	TYPE CLASS GRADE 1AB,2ABC C 1&2
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD 318 XD 324 MD 318 XD 324	MD NA XD NA MD 208 XD 180	MD NA XD NA MD — XD —	MD NA XD NA MD — XD —	MD 123 XD 91 MD — XD —	MD — XD — MD — XD —	MD 266 XD 191 MD — XD —
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD 300 XD — MD 300 XD —	MD NA XD NA MD 72.4 XD 64.8	MD NA XD NA MD 475 XD 362	MD NA XD NA MD 475 XD 362	MD 26 XD 42 MD — XD —	MD — XD — MD — XD —	MD 50.8 XD 58.4 MD — XD —
— — — —	— — — —	— — — —	— — — —	— — — —	NA NA — 0.0	NA NA — —	NA NA — —	14,200 — — .67	— — — —	— — — 0.00
MD — XD —	MD — XD —	MD — XD —	MD — XD —	MD — XD —	MD 1.0 XD 1.0	MD — XD —	MD — XD —	MD — XD —	MD — XD —	MD >1.0 XD >1.0
— —	— —	— —	— —	PASS PASS	NA PASS	NA —	NA —	PASS —	— —	— —
— —	— —	— —	— —	.1 MAX NA	0.06 NA	— NA	— NA	— —	— —	0.00 —
— —	— —	— —	— —	— —	NA PASS	NA —	NA —	— —	— —	— —
—	—	—	—	PASS	PASS	NA	NA	—	—	—
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD NA XD NA MD 166.3 XD — PASS	MD NA XD NA MD — XD —	MD NA XD NA MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD NA XD NA MD 176.8 XD — PASS	MD NA XD NA MD — XD —	MD NA XD NA MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD NA XD NA MD 175.5 XD — PASS	MD NA XD NA MD — XD —	MD NA XD NA MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —
—	—	—	—	NA	NA	—	NA	—	—	—
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	NA MD NA XD NA MD NA XD NA	PASS MD 92 XD 92 MD 66.2 XD 59.6	NA MD NA XD NA MD NA XD NA	NA MD NA XD NA MD NA XD NA	MD — XD — MD — XD —	MD — XD — MD — XD —	PASS MD — XD — MD — XD —
— —	— —	— —	— —	PASS PASS	NA PASS	NA —	NA —	— —	— —	— —
27	27	27	27	27	27	27	27	27	27	27

NORD BITUMI US INC	NORD BITUMI US INC	NORD BITUMI US INC	NORD BITUMI US INC	OWENS-CORNING	OWENS-CORNING	ROYAL OIL COMPANY	SIPLAST INC	SIPLAST INC	SIPLAST INC	SIPLAST INC
NORDPOLY 4M APP	NORDPOLY 5B APP	NORDFLEX S SBS	NORDFLEX M SBS	OWENS-CORNING DERBIGUM HPS	OWENS-CORNING DERBIGUM SP	ROYAL SINGLE-PLY	VERAL (ALUMINUM FACED)	VERAL (STAIN/ STEEL)	VERAL (COPPER FACED)	PARAFOR-50
TYPE CLASS GRADE 1AB,2AB A 1&2	TYPE CLASS GRADE 1AB,2ABC C 2	TYPE CLASS GRADE 1AB,2ABC C 1&2	TYPE CLASS GRADE 1AB,2AB A 1&2	TYPE CLASS GRADE — – —	TYPE CLASS GRADE — – —	TYPE CLASS GRADE 2A C 2	TYPE CLASS GRADE 1A B 1	TYPE CLASS GRADE 1A B 1	TYPE CLASS GRADE 1A B 1	TYPE CLASS GRADE 1A A 2
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD NA XD NA MD 208 XD 180.4	MD 139 XD 137 MD NA XD NA	MD 677 XD 676 MD NA XD NA	MD 139 XD 137 MD NA XD NA	MD NA XD NA MD 223 XD 185
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD NA XD NA MD 72.38 XD 64.76	MD 4.0 XD 5.0 MD NA XD NA	MD 3.0 XD 3.0 MD NA XD NA	MD 4.0 XD 5.0 MD NA XD NA	MD NA XD NA MD 68.2 XD 72.8
— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	NA NA 66,968 0.0	NA 3,613 NA 0.10	NA 9,039 NA 0.10	NA 3,557 NA 0.10	NA NA 82,104 0.30
MD — XD —	MD — XD —	MD — XD —	MD — XD —	MD — XD —	MD — XD —	MD 1.0 XD 1.0	MD — XD —	MD — XD —	MD — XD —	MD <1.0 XD <1.0
— —	— —	— —	— —	— —	— —	NA PASS	— NA	— NA	— NA	NA PASS
— —	— —	— —	— —	— —	— —	0.06 NA	— —	— —	— —	— NA
— —	— —	— —	— —	— —	— —	NA PASS	— NA	— NA	— NA	NA PASS
—	—	—	—	—	—	PASS	PASS	PASS	PASS	PASS
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD NA XD NA MD 166.32 XD — PASS	MD 169 XD 173 MD NA XD NA PASS	MD 169 XD 173 MD NA XD NA PASS	MD 169 XD 173 MD NA XD NA PASS	MD NA XD NA MD 194 XD — PASS
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD NA XD NA MD 176.8 XD — PASS	MD — XD — MD NA XD NA	MD — XD — MD NA XD NA	MD — XD — MD NA XD NA	MD NA XD NA MD 189 XD — PASS
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD NA XD NA MD 175.48 XD — PASS	MD — XD — MD NA XD NA	MD — XD — MD NA XD NA	MD — XD — MD NA XD NA	MD NA XD NA MD 177 XD — PASS
—	—	—	—	—	—	NA	NA	NA	NA	<1.0
MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	PASS MD 92 XD 92 MD 66.95 XD 59.58	MD — XD — MD — XD —	MD — XD — MD — XD —	MD — XD — MD — XD —	PASS MD 90 XD 90 MD 97 XD 97
— —	— —	— —	— —	— —	— —	NA PASS	— NA	NA NA	— NA	NA PASS
28	28	28	28	28	28	28	28	28	28	29

MODIFIED BITUMENS Part 2: Test Results *(See Part 1 for General Information)*

Test Description and Suggested Values As Specified in CGSB Standard 37-GP-56M

1. COMPANY NAME	SIPLAST INC	SIPLAST INC	SIPLAST INC	SIPLAST INC	SWEPCO	TAMKO	TELTEX INC	TEXAS REFINERY CORP	TREMCO INC
2. PRODUCT NAME	PARADIENE-30	PARADIENE-20	PARADIENE-20 PR	PARADIENE 40	SWEPCO UNI+ SHIELD	AWAPLAN	RHOFLEX	MIGHTYPLATE	THERM MB 3G25
3. TYPE 4. CLASS 5. GRADE	TYPE CLASS GRADE 1A A 1	TYPE CLASS GRADE 2A,2B C 1	TYPE CLASS GRADE 1 - 1	TYPE CLASS GRADE ____ - -	TYPE CLASS GRADE 2A,2B C 2	TYPE CLASS GRADE 1A A 1	TYPE CLASS GRADE 1A,2ABC C 1	TYPE CLASS GRADE 1A,2A C 2	TYPE CLASS GRADE ____ - -
6. BREAKING STRENGTH: GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD)	MD 91 XD 71 MD NA XD NA	MD 72 XD 67 MD NA XD NA	MD 93 XD 75 MD NA XD NA	MD ___ XD ___ MD ___ XD ___	MD NA XD NA MD 210 XD 176	MD 130 XD 129 MD NA XD NA	MD ___ XD ___ MD NA XD NA	MD NA XD NA MD 208 XD 180.4	MD ___ XD ___ MD ___ XD ___
7. ULTIMATE ELONGATION: GRADE 1 MIN. 4.0%(MD/XD) GRADE 2 MIN. 8.0%(MD/XD)	MD 24 XD 24 MD NA XD NA	MD 29 XD 27 MD NA XD NA	MD 68 XD 84 MD NA XD NA	MD ___ XD ___ MD ___ XD ___	MD NA XD NA MD 70 XD 65	MD 69 XD 65 MD NA XD NA	MD 57 XD 57 MD NA XD NA	MD NA XD NA MD 72.38 XD 64.76	MD ___ XD ___ MD ___ XD ___
8. LOAD STRAIN PRODUCT [BREAK STRENGTH(lbf) × ULTIMATE ELONGATION (%)]: GRADE 1 IF BREAKING STRENGTH IS NOT MET, 19400 GRADE 1 IF BREAKING STRENGTH IS MET, 2940 GRADE 2 MIN. 14700	NA 9,801 NA	NA 9,393 NA	NA 27,936 NA	____ ____ ____	NA NA ____	NA 40,000 NA	____ ____ NA	NA NA 66,968	____ ____ ____
9. WATER RESISTANCE NOT MORE THAN 1.0g DIMENSION CHG NOT MORE THAN ± 1.0%(MD/XD)	0.23 MD ___ XD ___	0.30 MD ___ XD ___	.030 MD 0.51 XD 0.51	____ MD ___ XD ___	0.0 MD PASS XD PASS	____ MD ___ XD ___	____ MD ___ XD ___	0.0 MD 1.0 XD 1.0	____ MD ___ XD ___
10. LOW TEMP FLEXIBILITY: TYPE 1 @ -22°F(PASS/FAIL) TYPE 2 @ -14°F(PASS/FAIL)	PASS NA	NA PASS	NA PASS	PASS NA	NA PASS	PASS NA	____ ____	____ PASS	____ ____
11. WATER VAPOR TRANSMISSION MAX. 1.0g/m² × 24 hr.	____	____	____	____	0.1	____	0.78	0.06	____
12. THERMAL STABILITY: TYPE 1, CLASS B ONLY LESS THAN 1.0mm/m	NA	NA	____	____	NA	NA	NA	NA	____
13. DYNAMIC IMPACT (PUNCTURING), WATER TIGHTNESS: GRADE 1 AFTER IMPACT OF 1.8 ft lbf(PASS/FAIL) GRADE 2 AFTER IMPACT OF 3.6 ft lbf(PASS/FAIL)	____ NA	____ NA	____ NA	____ NA	NA PASS	PASS NA	____ NA	NA PASS	____ ____
14. STATIC PUNCTURING: TYPE 1 WATER TIGHTNESS AFTER 1 hr. @ 55 lbf(PASS/FAIL)	PASS	PASS	PASS	PASS	PASS	PASS	____	PASS	____
15. LAP JOINT STRENGTH (5 DAY CONDITIONING): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD 70 XD 69 MD NA XD NA PASS	MD 74 XD 72 MD NA XD NA PASS	MD ___ XD ___ MD ___ XD ___ ____	MD ___ XD ___ MD ___ XD ___ ____	MD NA XD NA MD 166 XD ___ PASS	MD ___ XD ___ MD NA XD NA ____	MD ___ XD ___ MD NA XD NA ____	MD NA XD NA MD 166.32 XD ___ PASS	MD ___ XD ___ MD ___ XD ___
16. LAP JOINT STRENGTH (IMMERSION @ 50°C FOR 5 DAYS): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD ___ XD ___ MD NA XD NA ____	MD ___ XD ___ MD NA XD NA ____	MD ___ XD ___ MD ___ XD ___ ____	MD ___ XD ___ MD ___ XD ___ ____	MD NA XD NA MD 177 XD ___ PASS	MD ___ XD ___ MD NA XD NA ____	MD ___ XD ___ MD NA XD NA ____	MD NA XD NA MD 176.8 XD ___ PASS	MD ___ XD ___ MD ___ XD ___ ____
17. LAP JOINT STRENGTH (IMMERSION @ 50°C, 5 DAYS + FREEZE THAW): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD ___ XD ___ MD NA XD NA ____	MD ___ XD ___ MD NA XD NA ____	MD ___ XD ___ MD ___ XD ___ ____	MD ___ XD ___ MD ___ XD ___ ____	MD NA XD NA MD 176 XD ___ PASS	MD ___ XD ___ MD NA XD NA ____	MD ___ XD ___ MD NA XD NA ____	MD NA XD NA MD 175.48 XD ___ PASS	MD ___ XD ___ MD ___ XD ___ ____
18. GRANULE EMBEDMENT: CLASS A ONLY MAX. 0.5g LOSS	<1.0	NA	NA	<1.0	NA	<1.0	NA	NA	____
19. ACCELERATED WEATHERING: TYPE 1 ONLY NO CRACKING OR BLISTERING (PASS/FAIL) RETAIN 90% OF BREAKING STRENGTH (#6)(MD/XD) RETAIN 90% OF ELONGATION AT BREAK (#1)(MD/XD)	____ MD ___ XD ___ MD ___ XD ___	NA MD NA XD NA MD NA XD NA	NA MD NA XD NA MD NA XD NA	____ MD ___ XD ___ MD ___ XD ___	PASS MD 90.1 XD 92.0 MD 92.0 XD 92.0	PASS MD 92 XD 92 MD 100 XD 100	____ MD ___ XD ___ MD ___ XD ___	PASS MD 92 XD 92 MD 91 XD 92	____ MD ___ XD ___ MD ___ XD ___
20. CRACK BRIDGING CAPABILITY (NO CRACKING, SPLITTING OR LOSS OF ADHESION): TYPE 1A and 1.B AT -22°F (PASS/FAIL) TYPE 2.A and 2.B AT -14°F (PASS/FAIL)	____ NA	NA ____	NA ____	____ NA	NA PASS	____ NA	____ ____	____ PASS	____ ____
21. FOR GENERAL INFORMATION SEE PG(s)	29	29	29	29	29	29	29	29	29

22. LEGEND: NA = NOT APPLICABLE; MD = MACHINE DIRECTION; XD = CROSS MACHINE DIRECTION; BLANK LINES = APPLICABLE DATA NOT SUPPLIED BY MANUFACTURER

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1. COMPANY NAME	TREMCO INC	TREMCO INC	TRI-PLY INC	TROPICAL INDUSTRIAL COATINGS, INC	US INTEC INC	W R GRACE & CO	W R GRACE & CO	W R GRACE & CO	W R GRACE & CO
2. PRODUCT NAME	THERM MB 3G25S	THERM MB 3G40 and 4G40	TP-4	TROPISEAL	BRAI SP4	GRM 120	GRM 230	GRM 350	GRM 500
3. TYPE 4. CLASS 5. GRADE	TYPE CLASS GRADE ____ - -	TYPE CLASS GRADE ____ - -	TYPE CLASS GRADE 2A C 2	TYPE CLASS GRADE 2A C 2	TYPE CLASS GRADE 2A C 2	TYPE CLASS GRADE 1A,1B C 1	TYPE CLASS GRADE 2A,2B C 1	TYPE CLASS GRADE 2A C 1	TYPE CLASS GRADE 1A,1B C 1
6. BREAKING STRENGTH: GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD)	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD NA XD NA MD 208 XD 180.4	MD NA XD NA MD 200+ XD 180+	MD NA XD NA MD 208 XD 180.4	MD 102 XD 122 MD NA XD NA	MD 102 XD 105 MD NA XD NA	MD 51 XD 75 MD NA XD NA	MD 150 XD 168 MD NA XD NA
7. ULTIMATE ELONGATION: GRADE 1 MIN. 4.0%(MD/XD) GRADE 2 MIN. 8.0%(MD/XD)	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD NA XD NA MD 72.38 XD 64.76	MD NA XD NA MD 72.4 XD 64.8	MD NA XD NA MD 72.38 XD 64.76	MD 210 XD 151 MD NA XD NA	MD 169 XD 139 MD NA XD NA	MD 215 XD 138 MD NA XD NA	MD 164 XD 109 MD NA XD NA
8. LOAD STRAIN PRODUCT [BREAK STRENGTH(lbf) × ULTIMATE ELONGATION (%)]: GRADE 1 IF BREAKING STRENGTH IS NOT MET, 19400 GRADE 1 IF BREAKING STRENGTH IS MET, 2940 GRADE 2 MIN. 14700	____ ____ ____	____ ____ ____	NA NA ____	NA NA ____	NA NA 69,890	NA 95,550 NA	NA 76,900 NA	49,000 NA NA	NA 109,700 NA
9. WATER RESISTANCE NOT MORE THAN 1.0g DIMENSION CHG NOT MORE THAN ± 1.0%(MD/XD)	____ MD ___ XD ___	____ MD ___ XD ___	0.0 MD 1.0 XD 1.0	0.0 MD <1.0 XD <1.0	0.0 MD 1.0 XD 1.0	0.04 MD 0.0 XD 0.0	0.04 MD 0.0 XD 0.3	0.08 MD 0.0 XD 0.3	0.07 MD 0.0 XD 0.0
10. LOW TEMP FLEXIBILITY: TYPE 1 @ -22°F(PASS/FAIL) TYPE 2 @ -14°F(PASS/FAIL)	____ ____	____ ____	NA PASS	NA PASS	NA PASS	PASS NA	NA PASS	NA PASS	PASS NA
11. WATER VAPOR TRANSMISSION MAX. 1.0g/m² × 24 hr.	____	____	0.06	0.06	0.06	<0.01	____	.096	____
12. THERMAL STABILITY: TYPE 1, CLASS B ONLY LESS THAN 1.0mm/m	____	____	NA	NA	NA	NA	NA	NA	NA
13. DYNAMIC IMPACT (PUNCTURING), WATER TIGHTNESS: GRADE 1 AFTER IMPACT OF 1.8 ft lbf(PASS/FAIL) GRADE 2 AFTER IMPACT OF 3.6 ft lbf(PASS/FAIL)	____ ____	____ ____	NA PASS	NA PASS	NA PASS	PASS NA	PASS NA	PASS NA	PASS NA
14. STATIC PUNCTURING: TYPE 1 WATER TIGHTNESS AFTER 1 hr. @ 55 lbf(PASS/FAIL)	____	____	PASS	PASS	PASS	PASS	NA	NA	PASS
15. LAP JOINT STRENGTH (5 DAY CONDITIONING): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD ___ XD ___ MD ___ XD ___	MD ___ XD ___ MD ___ XD ___	MD NA XD NA MD 166.32 XD ___ PASS	MD NA XD NA MD 166 XD ___ PASS	MD NA XD NA MD 166.32 XD ___ PASS	MD 93 XD 93 MD NA XD NA PASS	MD 93 XD 93 MD NA XD NA PASS	MD ___ XD ___ MD NA XD NA PASS	MD 104 XD 104 MD NA XD NA PASS
16. LAP JOINT STRENGTH (IMMERSION @ 50°C FOR 5 DAYS): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD ___ XD ___ MD ___ XD ___ ____	MD ___ XD ___ MD ___ XD ___ ____	MD NA XD NA MD 176.8 XD ___ PASS	MD NA XD NA MD 176 XD ___ PASS	MD NA XD NA MD 176.8 XD ___ PASS	MD 105 XD 105 MD NA XD NA PASS	MD 105 XD 105 MD NA XD NA PASS	MD 90 XD 90 MD NA XD NA PASS	MD 121 XD 121 MD NA XD NA PASS
17. LAP JOINT STRENGTH (IMMERSION @ 50°C, 5 DAYS + FREEZE THAW): GRADE 1 MIN. 66 lbf(MD/XD) GRADE 2 MIN. 176 lbf(MD/XD) GRADE 1&2 PASS WATER TIGHTNESS TEST (PASS/FAIL)	MD ___ XD ___ MD ___ XD ___ ____	MD ___ XD ___ MD ___ XD ___ ____	MD NA XD NA MD 175.48 XD ___ PASS	MD NA XD NA MD 175 XD ___ PASS	MD NA XD NA MD 175.48 XD ___ PASS	MD 111 XD 111 MD NA XD NA PASS	MD 111 XD 111 MD NA XD NA PASS	MD 93 XD 93 MD NA XD NA PASS	MD 122 XD 122 MD NA XD NA PASS
18. GRANULE EMBEDMENT: CLASS A ONLY MAX. 0.5g LOSS	____	____	NA	NA	NA	NA	NA	NA	NA
19. ACCELERATED WEATHERING: TYPE 1 ONLY NO CRACKING OR BLISTERING (PASS/FAIL) RETAIN 90% OF BREAKING STRENGTH (#6)(MD/XD) RETAIN 90% OF ELONGATION AT BREAK (#1)(MD/XD)	____ MD ___ XD ___ MD ___ XD ___	____ MD ___ XD ___ MD ___ XD ___	PASS MD 92 XD 92 MD 66.15 XD 59.58	PASS MD 91.2 XD 92.1 MD 91.4 XD 92.1	PASS MD 92 XD 92 MD 91 XD 90	PASS MD 124 XD ___ MD 96 XD ___	NA MD NA XD NA MD NA XD NA	NA MD NA XD NA MD NA XD NA	PASS MD 113 XD ___ MD 107 XD ___
20. CRACK BRIDGING CAPABILITY (NO CRACKING, SPLITTING OR LOSS OF ADHESION): TYPE 1A and 1.B AT -22°F (PASS/FAIL) TYPE 2.A and 2.B AT -14°F (PASS/FAIL)	____ ____	____ ____	NA PASS	NA PASS	NA PASS	PASS NA	NA PASS	NA PASS	PASS NA
21. FOR GENERAL INFORMATION SEE PG(s)	29	29	30	30	30	30	30	30	30

22. LEGEND: NA = NOT APPLICABLE; MD = MACHINE DIRECTION; XD = CROSS MACHINE DIRECTION; BLANK LINES = APPLICABLE DATA NOT SUPPLIED BY MANUFACTURER

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PVC POLYVINYL CHLORIDE Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	ALKOR-DIVISION HEDWIN CORP	BARRA CORP OF AMERICA INC	BARRA CORP OF AMERICA INC	DIVERSITECH GENERAL BUILDING SYSTEMS, DIV	DYNAMIT NOBEL	DYNAMIT NOBEL	DYNAMIT NOBEL	DYNAMIT NOBEL	DYNAMIT NOBEL
2. PRODUCT NAME	ALKORPLAN	RHENOFOL C-45	RHENOFOL CV48	GENSEAL ACR	TROCAL SMA	TROCAL SGMA	TROCAL S-60	TROCAL SG-60	TROCAL S-48* .48 MIL VERSION OF S-60
3. PRODUCT DESCRIPTION:									
A. REINFORCEMENT	NONE	NONE	POLYESTER	NONE	NONE	GLASS	NONE	NONE	NONE
B. COLOR	GREY	PALE GREY	GREY/WHITE	GREY/BLACK	BEIGE	BEIGE	LT GREY	LT GREY	LT GREY
C. INSTALLED WT (lbs/ft² W/O BALLAST)	.33	.30	.327	.30	.30	.30	.42	.42	.30
4. COATING REQUIRED	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X	X	X
B. REROOFING	X	X	X	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT
7. TYPE OF ROOF SYSTEM:									
A. LOOSE LAID/BALLASTED (BALLAST: lbs/ft²)	10	10		X	10 LBS MIN	10 LBS MIN			
B. PARTIALLY ADHERED (METHOD)			MECH FASTN	X			X		X
C. FULLY ADHERED (METHOD)				X					
D. PROTECTED MEMBRANE ROOFING ASSEMBLY	X	X	X		X	X			
8. MINIMUM SLOPE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL		DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
9. USE OVER:									
A. PERLITE	X	X	X	X	X	X	X	X	X
B. POLYURETHANE	X	X	X	X	X	X	X	X	X
C. WOOD FIBER	X	X	X	X	X	X	X	X	X
D. GLASS FIBER	X	X	X	X	X	X	X	X	X
E. EXPANDED POLYSTYRENE	X	X	X	X*	X	X	X	X	X
F. FELT FACED COMPOSITES	X	X	X	X	W/SLIPSHEET	X	X	X	X
G. OTHER	POLY-ISOCYANURATE			ISOCYANURATE PERLITE, WOOD FIBRE *SLIPSHEET	SEE SPECIFICATIONS	SEE SPECIFICATIONS	SEE SPECIFICATIONS	SEE SPECIFICATIONS	SEE SPECIFICATIONS
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	TROPICAL	SEE LITRATRE	SEE LITRATRE	SEE MFR	SEE LITRATRE	SEE LITRATRE	SEE LITRATRE	SEE LITRATRE	SEE LITRATRE
11. WORKABLE TEMPERATURE RANGE	0 F-115 F	0 F-120 F	0 F-120 F	SEE MFR	0 F-120 F	0 F-120 F	0 F-120 F	0 F-120 F	0 F-120 F
12. FLASHING MATERIAL	PVC COATED METAL	PVC COATED METAL	PVC COATED METAL GREY/WHITE	MEMBRANE/ METAL	PVC COATED METAL/REIN-FORCED MEMBR	PVC COATED METAL/REIN-FORCED MEMBR	PVC COATED METAL/REIN-FORCED MEMBR	PVC COATED METAL/REIN-FORCED MEMBR	PVC COATED METAL/REIN-FORCED MEMBR
13. FLASHING METHOD	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT	SEE MANUFACTURER	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	YES	YES	YES		YES	YES	YES	YES	YES
15. COUNTRY: A. ORIGIN	BELGIUM	W GERMANY	W GERMANY	USA	W GERMANY	W GERMANY	W GERMANY	W GERMANY	W GERMANY
B. MANUFACTURE	BELGIUM	W GERM'Y/USA	W GERM'Y/USA	USA	USA	USA/W GERM'Y	USA/W GERM'Y	USA/W GERM'Y	USA/W GERM'Y
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)	1970	1966	1966	1983	1971		1966		
B. USA (YEAR)(CITY FIRST INSTALLED)	1980-LINCOLN, NE	1976-INDIANAPOLIS	1976	1980	1977-NEW YORK		1971-NEW YORK		1982-USA
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN	NOT AVAIL	1.6 MIL ALL	1.6 MIL ALL		>20,000,000		>15,000,000		
B. USA	50,000	100,000	108,000	41,000	>10,000,000		>5,000,000		
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)									
A. DURATION (YEARS)	10	5/10	5/10	10	10	10	10	10	10
B. RENEWABLE AFTER INSPECTION (YES/NO)				NO					
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY				X					
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE	X	X	X	X	X	X	X	X	X
D.2 ORIG. COST OF INSTALT'N				X					
D.3 $ PER SQUARE				X					
E. EXCLUSION FROM COVERAGE									
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE	COAL TAR SEE CHEM RES LIS	COAL TAR OIL ANIMAL FATS	COAL TAR OIL ANIMAL FATS	COAL TAR	COAL TAR SEE CHEM RES LIS	COAL TAR SEE CHEM RES LIS	COAL TAR SEE CHEM RES LIS	COAL TAR SEE CHEM RES LIS	COAL TAR SEE CHEM RES LIS
20. METHOD OF DISTRIBUTION	MFR/REPS	DIRECT TO CONTRACTORS	DIRECT TO CONTRACTORS	DISTRI-BUTORS	MANUFACTURER	MANUFACTURER	MANUFACTURER	MANUFACTURER	MANUFACTURER
21. NUMBER OF REGIONAL LOCATIONS	5	8	8	8	4	4	4	4	4
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES	YES	YES	YES	YES	YES	YES	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	ON JOB TRAINING	FACTORY FIELD	FACTORY FIELD	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS
24. SALES INFORMATION CONTACT	OFFICE	CUSTOMER SERVICE	CUSTOMER SERVICE	R SIMMONS	SALES AID GROUP	SALES AID GROUP	SALES AID GROUP	SALES AID GROUP	SALES AID GROUP
25. TECHNICAL INFORMATION CONTACT	OFFICE	TECHNICAL SERVICE	TECHNICAL SERVICE	R HULTZ	TECHNICAL SERVICE	TECHNICAL SERVICE	TECHNICAL SERVICE	TECHNICAL SERVICE	TECHNICAL SERVICE
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	41	41	41	41	41	41	41	41	41

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PVC POLYVINYL CHLORIDE Part 1 *(See Part 2 for Test Results)*

IPW INTERPLASTIC	IPW INTERPLASTIC	PANTASOTE INC	PMS/ SUCOFLEX	PMS/ SUCOFLEX	RUBBER PLASTICS COMPOUND CO, INC	RUBBER PLASTICS COMPOUND CO, INC	SARNAFIL INC	SARNAFIL INC	SARNAFIL INC	WAT PRO INC	WAT PRO INC
INTEROOF "U"	INTEROOF "B"	FLEXHIDE LR 50*	SUCOFLEX F-132	SUCOFLEX F-127	NERVAPLY BM	NERVAPLY UB	SARNAFIL G410	SARNAFIL S327	SARNAFIL G442	FLAGON C	FLAGON MF
NONE	NONE	POLYESTER	FIBERGLASS	POLYESTER	NONE	NONE	FIBERGLASS	POLYESTER	FIBERGLASS	NONE	NONE
GREY .40	GREY .30	LT GREY/WH .32	LIGHT GREY .33	LIGHT GREY .37	SLATE .36	BONE .49	GREY & AST'D .33	GREY .33	GREY .33	LIGHT GREY .33	LIGHT GREY .33
NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X
SOLVENT/ THERMAL	SOLVENT/ THERMAL	SOLVENT/ HEAT	HOT AIR WELD	HOT AIR WELD	SOLVENT/ HEAT	SOLVENT/ HEAT	HOT AIR WELD	HOT AIR WELD	HOT AIR WELD	SOLVENT/ HEAT	SOLVENT/ HEAT
X	12	MECH FASTND	10-12 X X X	MECH FASTEND	10 LOOSE LAID NO NO	BAR/WASHER NO NO	X	MECH FASTEND	10 X	10	10 MECH FASTEND
DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	1:12	6:12+	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
X	X	X	X	X	X	X			X	X	X
X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X
	X	X	X	X	X	X		LAM'D SLPSHT	W/SLIPSHEET	X	X
X	X	X	X	X	X	X				X	X
X	X	X			X	X				X	X
		ISOCYANURATE EXTRUDED POLYSTYRENE	ISOCYANURATE CONCRETE, PLYWOOD, CONSULT MFGR	ISOCYANURATE CONCRETE, PLYWOOD, CONSULT MFGR			ISOCYANURATE	ISOCYANURATE	ISOCYANURATE		
NONE 0 F-110 F	NONE 0 F-100 F	NONE 0 F-120 F	NONE 0 F-120 F	NONE 0 F-120 F	NONE 5 F-140 F	NONE 5 F-140 F	NONE 0 F-120 F	NONE 0 F-120 F	NONE 0 F-120 F	NONE 0 F-120 F	NONE 0 F-120 F
PVC COATED METAL	PVC COATED METAL	COATED METAL	PVC CLAD METAL & F132 MEMBRANE	PVC CLAD METAL & F132 MEMBRANE	SELF OR PVC METAL	SELF OR PVC METAL	G410	G410 OR S327	G442	PVC/PVC CTD METAL	PVC/PVC CTD METAL
SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT	ADHESIVE & HEAT WELD	ADHESIVE & HEAT WELD	SOLVENT/ HEAT	SOLVENT/ HEAT	ADHESIVE & HEAT WELD	ADHESIVE & HEAT WELD	ADHESIVE & HEAT WELD	SOLVENT/ HEAT/ ADHESIVE	SOLVENT/ HEAT/ ADHESIVE
YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES
AUSTRIA AUSTRIA	AUSTRIA AUSTRIA	USA USA	SWITZERLAND SWITZERLAND	SWITZERLAND SWITZERLAND	USA USA	USA USA	SWITZERLAND USA	SWITZERLAND USA	SWITZERLAND USA	ITALY USA	ITALY USA
1970 1982-LOS ANGELES	1968 1982-DETROIT	1978-STANHOPE	1966 1980-HAWTHORNE	1969 1980-EL SEGUNDO	1980-NEW YORK CTY	1980-FLINT	1964 1975-NEW HAMPSHIRE	1964 1978-ILLINOIS	1964 1977-MASSACHUSETTS	1963 1978	1963 1978
		<30,000	CONSULT MFR 100,000	CONSULT MFR CONSULT MFR	NONE 180,000	NONE 170,000	NA THOUSANDS	NA THOUSANDS	NA THOUSANDS	800,000 THOUSANDS	THOUSANDS
10	10	5 OR 10 NO	10 X	10 X	10 X	10 X	10 NO X	10 NO X	10 NO X	10	10
X	X	X	X	X	X	X	X	X	X	X	X
X	X	X X	X	X	X	X				X	X
							REPLMT VALUE	REPLMT VALUE	REPLMT VALUE	REPLMT VALUE	REPLMT VALUE
		X	X	X	X	X	X	X	X	X	X
	X	X	X	X	X	X	X	X	X	X	
COAL TAR	COAL TAR	PETROLEUM COAL TAR	BITUMEN, OILS ANIMAL FATS	BITUMEN, OILS ANIMAL FATS	COAL TAR	NEEDS SEPARATE SHEET	SEE APPENDIX	SEE APPENDIX	SEE APPENDIX	BITUMEN OILS COAL TAR	BITUMEN OILS COAL TAR
DIRECT	DIRECT	LICENSED CONTRS ONLY	DIRECT	DIRECT	DIRECT & DISTRIBUTOR	DIRECT & DISTRIBUTOR	DIRECT	DIRECT	DIRECT	DIRECT, DISTRIBUTORS	DIRECT, DISTRIBUTORS
YES	YES	1 YES	8 YES	8 YES	2 YES	2 YES	6 YES	6 YES	6 YES	7 YES	7 YES
FIELD	FIELD	FIELD, SEMINARS, FACTORY	FIELD, FACTORY	FIELD, FACTORY	FIELD	FIELD	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS	FIELD, SEMINARS
P DOWNEY R COURSEY	P DOWNEY R COURSEY	J COPPOLA L KAMP	D KENNEDY T VALESH	D KENNEDY T VALESH	J KLAUS J LYNCH	J KLAUS J LYNCH	R WARSHAW E STEWART	R WARSHAW E STEWART	R WARSHAW E STEWART	201/528-6727 201/528-6727	201/528-6727 201/528-6727
41	41	41	41	41	41	41	41	41	41	41	41

PVC POLYVINYL CHLORIDE Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	WAT PRO INC	WAT PRO INC
2. PRODUCT NAME	FLAGON SF	FLAGON MFR
3. PRODUCT DESCRIPTION:		
A. REINFORCEMENT	FIBERGLAS	FIBERGLAS
B. COLOR	OFF WHITE	OFF WHITE
C. INSTALLED WT (lbs/ft² W/O BALLAST)	.33	.33
4. COATING REQUIRED	NONE	NONE
5. USE: A. NEW ROOFING	X	X
B. REROOFING	X	X
6. FIELD LAP JOINT METHOD	SOLVENT/ HEAT	SOLVENT/ HEAT
7. TYPE OF ROOF SYSTEM:		
A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)	10	10
B. PARTIALLY ADHERED (METHOD)		MECH FASTEND
C. FULLY ADHERED (METHOD)	X	
D. PROTECTED MEMBRANE ROOFING ASSEMBLY		
8. MINIMUM SLOPE	DEAD LEVEL	DEAD LEVEL
9. USE OVER:		
A. PERLITE	X	X
B. POLYURETHANE	X	X
C. WOOD FIBER	X	X
D. GLASS FIBER	X	X
E. EXPANDED POLYSTYRENE	X	X
F. FELT FACED COMPOSITES	X	X
G. OTHER		
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE
11. WORKABLE TEMPERATURE RANGE	0 F-120 F	0 F-120 F
12. FLASHING MATERIAL	PVC/PVC CTD METAL	PVC/PVC CTD METAL
13. FLASHING METHOD	SOLVENT/ HEAT/ ADHESIVE	SOLVENT/ HEAT/ ADHESIVE
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	YES	YES
15. COUNTRY: A. ORIGIN	ITALY	ITALY
B. MANUFACTURE	ITALY	ITALY
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)	1963	1963
B. USA (YEAR)(CITY FIRST INSTALLED)	1978	1978
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN		
B. USA	THOUSANDS	THOUSANDS
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)		
A. DURATION (YEARS)	10	10
B. RENEWABLE AFTER INSPECTION (YES/NO)		
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY		
C.2 WORKMANSHIP & MAT'L	X	X
D. MONETARY LIMITATION D.1 NONE	X	X
D.2 ORIG. COST OF INSTALT'N		
D.3 $ PER SQUARE	REPLMT VALUE	REPLMT VALUE
E. EXCLUSION FROM COVERAGE		
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X
E.2 CONSEQUENTIAL DAMAGES		
19. LIMITATIONS OR RESTRICTED USE	BITUMEN OILS COAL TAR	BITUMEN OILS COAL TAR
20. METHOD OF DISTRIBUTION	DIRECT, DISTRIBUTORS	DIRECT, DISTRIBUTORS
21. NUMBER OF REGIONAL LOCATIONS	7	7
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FIELD, SEMINARS	FIELD, SEMINARS
24. SALES INFORMATION CONTACT	201/528-6727	201/528-6727
25. TECHNICAL INFORMATION CONTACT	201/528-6727	201/528-6727
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	41	41

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PVC Part 2: Test Results *(See Part 1 for General Information)*

Test Description and Suggested Values As Specified in Proposed ASTM Document D4434

COMPANY NAME	ALKOR-DIVISION HEDWIN CORP	BARRA CORP OF AMERICA INC	BARRA CORP OF AMERICA INC	DIVERSITECH GENERAL BUILDING SYSTEMS, DIV	DYNAMIT NOBEL	DYNAMIT NOBEL	DYNAMIT NOBEL	DYNAMIT NOBEL	DYNAMIT NOBEL	IPW INTERPLASTIC	IPW INTERPLASTIC	PANTASOTE INC	PMS/ SUCOFLEX
PRODUCT NAME	ALKORPLAN	RHENOFOL C-45	RHENOFOL CV48	GENSEAL ACR	TROCAL SMA	TROCAL SGMA	TROCAL S-60	TROCAL SG-60	TROCAL S-48* .48 MIL VERSION OF S-60	INTEROOF "U"	INTEROOF "B"	FLEXHIDE LR 50	SUCOFLEX F-132
TYPE		I	III	I	I	III	I	III	I	I		III	II
GRADE				B									1
1. OVERALL THICKNESS: TYPE I, II, III MIN., INCHES 0.045		0.045	0.048	0.045	0.048	0.048	0.060	0.060	0.048	.060		0.050	0.048
2. TENSILE STRENGTH AT BREAK: TYPE I, TYPE II-GRADE I MIN., psi MACHINE DIRECTION 1500		2440	NA	2100	>2130	>1640	>2130	>1640	>2130	2780		**	*552
CROSS MACHINE DIRECTION 1500				2100	>2130	>1640	>2130	>1640	>2130	2690		NA	1552
3. BREAKING STRENGTH: TYPE II-GRADE 2, TYPE III MIN., lbf/INCH 200		NA			NA		NA		NA	NA		290	NA
4. ELONGATION AT BREAK TYPE I, TYPE II-GRADE 1 MIN.,% MACHINE DIRECTION 250		350	NA	300	>300	>300	>300	>300	>300	360		NA	263
CROSS MACHINE DIRECTION 250			NA	300	>300	>300	>300	>300	>300	370		NA	253
TYPE II-GRADE 2, TYPE III MIN.,% MACHINE DIRECTION 15(1)		NA			NA		NA		NA			25	NA
CROSS MACHINE DIRECTION 15(1)		NA			NA		NA		NA			25	NA
5. SEAM STRENGTH: TYPE I, II, III MIN.,% OF TENSILE OR BREAKING STRENGTH 75.0				>75.0	>75	>75	>75	>75	>75			90.0	79
6. RETENTION OF PROPERTIES AFTER HEAT AGING TENSILE STRENGTH: TYPE I MIN.,% OF ORIGINAL 80.0		100	NA	>80.0	>80	NA	>80	NA	>80	+7		NA	NA
BREAKING STRENGTH: TYPE II, III MIN.,% OF ORIGINAL 80.0					NA	>80	NA	>80	NA	NA		100	85
ELONGATION: TYPE I, II, III MIN.,% OF ORIGINAL 80.0		94		>95.0	>80	>80	>80	>80	>80	98			83
7. TEAR RESISTANCE: TYPE I, TYPE II-GRADE 1 MIN., lbf 10.0			NA	15.0		NA		NA		17		NA	12
8. TEARING STRENGTH: TYPE II-GRADE 2, TYPE III MIN., lbf 45.0		NA	450 LBS/IN		NA		NA		NA	NA		110	NA
9. LOW TEMPERATURE BEND: TYPE I, II, III PASS					PASS	PASS	PASS	PASS	PASS	-40 F		PASS	PASS
10. ACCELERATED WEATHERING TEST CRACKING: TYPE I, II, III PENDING													
DISCOLORATION: TYPE I, II, III PENDING													
CRAZING: TYPE I, II, III PENDING													
11. LINEAR DIMENSIONAL CHANGE TYPE I, MAX.,% 3.0				<1.0	<2	NA	<2	NA	<2	0.3		NA	NA
TYPE II, MAX.,% 0.1					NA	NA	NA	NA	NA			NA	0.03
TYPE III, MAX.,% 0.5			0.5		NA	<.1	NA	<.1	NA			0.5	NA
12. CHANGE IN WEIGHT AFTER IMMERSION IN WATER TYPE I, II, III; MAX.,% ±3.0				+3.0	+- 2	+- 2	+- 2	+- 2	+- 2	1.0		+1.2	+0.2
FOR GENERAL INFORMATION SEE PG(s)	38	38	38	38	38	38	38	38	38	39	39	39	39

NOTE (1) FOR REINFORCING MATERIAL FABRIC ONLY.
ELONGATION OF PVC MATERIAL SHALL BE THE SAME AS TYPE I.

COMPANY NAME	PMS/ SUCOFLEX	RUBBER PLASTICS COMPOUND CO, INC	RUBBER PLASTICS COMPOUND CO, INC	SARNAFIL INC	SARNAFIL INC	SARNAFIL INC	WAT PRO INC	WAT PRO INC	WAT PRO INC	WAT PRO INC
PRODUCT NAME	SUCOFLEX F-127	NERVAPLY BM	NERVAPLY UB	SARNAFIL G410	SARNAFIL S327	SARNAFIL G442	FLAGON C	FLAGON MF	FLAGON SF	FLAGON MFR
TYPE	III	I	I	II	III	II	I	I	III	III
GRADE				1		1				
1. OVERALL THICKNESS: TYPE I, II, III MIN., INCHES 0.045	0.048	0.048	0.054	0.048	0.048	0.048	0.048	0.060	0.048	0.048
2. TENSILE STRENGTH AT BREAK: TYPE I, TYPE II-GRADE I MIN., psi MACHINE DIRECTION 1500	NA	2390	2040	1550	NA	1800	2600	2600	NA	NA
CROSS MACHINE DIRECTION 1500	NA	2260	2520	1500	NA	1750	2600	2600	NA	NA
3. BREAKING STRENGTH: TYPE II-GRADE 2, TYPE III MIN., lbf/INCH 200	295	NA	NA	NA	200	NA	NA	NA	220	220
4. ELONGATION AT BREAK TYPE I, TYPE II-GRADE 1 MIN.,% MACHINE DIRECTION 250	NA	325	325	330	NA	300	325	325	NA	NA
CROSS MACHINE DIRECTION 250	NA	275	275	280	NA	300	325	325	NA	NA
TYPE II-GRADE 2, TYPE III MIN.,% MACHINE DIRECTION 15(1)	25	NA	NA	NA	80	NA	NA	NA		
CROSS MACHINE DIRECTION 15(1)	21	NA	NA	NA	80	NA	NA	NA		
5. SEAM STRENGTH: TYPE I, II, III MIN.,% OF TENSILE OR BREAKING STRENGTH 75.0	78	80	80	100	100	100	PASS	PASS	PASS	PASS
6. RETENTION OF PROPERTIES AFTER HEAT AGING TENSILE STRENGTH: TYPE I MIN.,% OF ORIGINAL 80.0	NA	109	107	110	NA	100	PASS	PASS	NA	NA
BREAKING STRENGTH: TYPE II, III MIN.,% OF ORIGINAL 80.0	84	NA	NA	NA	100	NA	NA	NA	PASS	PASS
ELONGATION: TYPE I, II, III MIN.,% OF ORIGINAL 80.0	83	115	92.5	90	90	90	PASS	PASS	PASS	PASS
7. TEAR RESISTANCE: TYPE I, TYPE II-GRADE 1 MIN., lbf 10.0	NA	265	355	10.0	NA	10.0	PASS	PASS	NA	NA
8. TEARING STRENGTH: TYPE II-GRADE 2, TYPE III MIN., lbf 45.0	48	NA	NA	NA	50	NA	PASS	PASS	PASS	PASS
9. LOW TEMPERATURE BEND: TYPE I, II, III PASS	PASS	-30 F	-30 F	PASS	PASS	PASS	PASS	PASS	PASS	PASS
10. ACCELERATED WEATHERING TEST CRACKING: TYPE I, II, III PENDING										
DISCOLORATION: TYPE I, II, III PENDING										
CRAZING: TYPE I, II, III PENDING										
11. LINEAR DIMENSIONAL CHANGE TYPE I, MAX.,% 3.0	NA	2.5	2.7	NA	NA	NA	0.5	0.5		
TYPE II, MAX.,% 0.1	NA	NA	NA	0.04	NA	0.04			0.1	0.1
TYPE III, MAX.,% 0.5	0.2	NA	NA	NA	0.06	NA				
12. CHANGE IN WEIGHT AFTER IMMERSION IN WATER TYPE I, II, III; MAX.,% ±3.0	+0.5	2.0	2.3	1.3	1.5	1.3	PASS	PASS	PASS	PASS
FOR GENERAL INFORMATION SEE PG(s)	39	39	39	39	39	39	39	39	40	40

NOTE (1) FOR REINFORCING MATERIAL FABRIC ONLY.
ELONGATION OF PVC MATERIAL SHALL BE THE SAME AS TYPE I.

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EPDM ETHYLENE PROPYLENE DIENE MONOMER Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	AMERICAN HYDROTECH, INC	AMERICAN HYDROTECH, INC	AMERICAN HYDROTECH, INC	AMERICAN HYDROTECH, INC	BARRA CORP OF AMERICA, INC	BARRA CORP OF AMERICA, INC	BARRA CORP OF AMERICA, INC	BARRA CORP OF AMERICA, INC	BARRA CORP OF AMERICA, INC
2. PRODUCT NAME	HYDRO-SEAL .045 BLACK	HYDRO-SEAL .045 WHITE	HYDRO-SEAL .060 BLACK	HYDRO-SEAL .060 WHITE	RUBBERSHIELD 45 BLACK	RUBBERSHIELD 45 BLACK FIRE RATED	RUBBERSHIELD 60 BLACK	RUBBERSHIELD 60 WHITE	RUBBERSHIELD 60 WHITE FIRE RATED
3. PRODUCT DESCRIPTION:									
A. REINFORCEMENT	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
B. COLOR	BLACK	WHITE	BLACK	WHITE	BLACK	BLACK	BLACK	WHITE	WHITE
C. INSTALLED WT (lbs/ft² W/O BALLAST)	.26	.30	.35	.40	.28	.28	.38	.38	.38
4. COATING REQUIRED	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X	X	X
B. REROOFING	X	X	X	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD	ADHESIVE/ SEALANT	ADHESIVE/ SEALANT	ADHESIVE/ SEALANT	ADHESIVE/ SEALANT	ADHESIVE	ADHESIVE	ADHESIVE	ADHESIVE	ADHESIVE
7. TYPE OF ROOF SYSTEM:									
A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)	10 MIN		10 MIN		10 MIN	NA	X	10 MIN	NA
B. PARTIALLY ADHERED (METHOD)	MECH FAST	MECH FAST	MECH FAST	MECH FAST					
C. FULLY ADHERED (METHOD)	CONT ADHESVE	CONT ADHESVE	CONT ADHESVE	CONT ADHESVE	X	X	X	X	X
D. PROTECTED MEMBRANE ROOFING ASSEMBLY	IRMA		IRMA		X	NA	X	NA	NA
8. MINIMUM SLOPE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
9. USE OVER:									
A. PERLITE	X	X	X	X	X		X		
B. POLYURETHANE	X	X	X	X	X	X	X	X	X
C. WOOD FIBER	X	X	X	X	X	X	X	X	X
D. GLASS FIBER	X	X	X	X	X		X	X	
E. EXPANDED POLYSTYRENE	X	X	X	X	X		X		
F. FELT FACED COMPOSITES	X	X	X	X	X	X	X	X	
G. OTHER	CONTRACT AHI FOR SPECIFICS	CONTACT AHI FOR SPECIFICS	CONTACT AHI FOR SPECIFICS	CONTACT AHI FOR SPECIFICS	SEE SPECS OR TECH BULLETINS	SEE SPECS OR TECH BULLETINS	SEE SPECS OR TECH BULLETINS	SEE SPECS OR TECH BULLETINS	SEE SPECS OR TECH BULLETINS
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE		NONE	
11. WORKABLE TEMPERATURE RANGE	20 F-110 F	20 F-110 F	20 F-110 F	20 F-110 F	TECH SVCS	TECH SVCS	TECH SVCS	TECH SVCS	TECH SVCS
12. FLASHING MATERIAL	UNCURED NEO PVC COATED METAL	UNCURED EPDM	UNCURED NEO	UNCURED EPDM	UNCURED NEOPRENE	UNCURED NEOPRENE	UNCURED NEOPRENE	UNCURED NEOPRENE	UNCURED NEOPRENE
13. FLASHING METHOD	ADHESIVE/ SEALANT HEAT	ADHESIVE/ SEALANT	ADHESIVE/ SEALANT	ADHESIVE/ SEALANT	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	YES	YES	YES	YES					
15. COUNTRY: A. ORIGIN	USA	USA	USA	USA	USA	USA	USA	USA	USA
B. MANUFACTURE	USA	USA	USA	USA	USA	USA	USA	USA	USA
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)									
B. USA (YEAR)(CITY FIRST INSTALLED)	1981	1981	1981	1981	1965 MISHAWAKA		1965 MISHAWAKA	1966 MISHAWAKA	
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN									
B. USA	THOUSANDS	THOUSANDS	THOUSANDS	THOUSANDS	2000	500	100	200	510
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)									
A. DURATION (YEARS)	10	10	10	10	5/10	5/10	5/10	5/10	5/10
B. RENEWABLE AFTER INSPECTION (YES/NO)	NO	NO	NO	NO					
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY									
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE									
D.2 ORIG. COST OF INSTALT'N					X	X	X	X	X
D.3 $ PER SQUARE	X	X	X	X					
E. EXCLUSION FROM COVERAGE									
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE	CONTACT AHI	CONTACT AHI	CONTACT AHI	CONTACT AHI	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS
20. METHOD OF DISTRIBUTION	REPS/DIRECT	REPS/DIRECT	REPS/DIRECT	REPS/DIRECT	CONTRACTORS	CONTRACTORS	CONTRACTORS	CONTRACTORS	CONTRACTORS
21. NUMBER OF REGIONAL LOCATIONS	30	30	30	30	8	8	8	8	8
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES	YES	YES	YES	YES	YES	YES	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	SEMINARS, FIELD TRAINING	SEMINARS, FIELD TRAINING	SEMINARS, FIELD TRAINING	SEMINARS, FIELD TRAINING	FIELD	FIELD	FIELD	FIELD	FIELD
24. SALES INFORMATION CONTACT	B LECUYER OFFICE	B LECUYER	B LECUYER	B LECUYER	CUST SERV	CUST SERV	CUST SERV	CUST SERV	CUST SERV
25. TECHNICAL INFORMATION CONTACT	E JARGER OFFICE	E JARGER	E JARGER	E JARGER	TECH SERV	TECH SERV	TECH SERV	TECH SERV	TECH SERV
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	50	52	50	52	50	50	50	52	52

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EPDM ETHYLENE PROPYLENE DIENE MONOMER Part 1 *(See Part 2 for Test Results)*

CARLISLE SYNTEC SYSTEMS	CARLISLE SYNTEC SYSTEMS	CARLISLE SYNTEC SYSTEMS	CARLISLE SYNTEC SYSTEMS	CELOTEX	CELOTEX	DIVERSITECH GENERAL BUILDING SYSTEMS DIV	DIVERSITECH GENERAL BUILDING SYSTEMS DIV	DIVERSITECH GENERAL BUILDING SYSTEMS DIV	DUNLOP CONSTRUCTION PRODUCTS INC	DUNLOP CONSTRUCTION PRODUCTS INC	DUNLOP CONSTRUCTION PRODUCTS INC
SURE-SEAL EPDM .045	SURE-SEAL EPDM .060	SURE-SEAL FR EPDM .045	SURE-SEAL FR EPDM .060	CELO I TYP I .045 LOOSE LAID & BALST	CELO I TY II .060 FULLY ADHERED	GENFLEX ACR .045 BLACK	GENFLEX ACR .045 WHITE	GENFLEX ACR .060 BLACK and .060 WHITE	DUNSEAL .045	DUNSEAL .060	DUNSEAL .045
NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE REQUIRED	NONE REQUIRED	WITH	WITH	WITHOUT
GREY/BLACK .30	GREY/BLACK .40	GREY/BLACK .30	GREY/BLACK .40	BLACK .27	BLACK .36	BLACK .26	WHITE .28	BLACK & WH. .38	BLACK .28	BLACK .38	BLACK .28
NONE	NONE	X	X	NONE	NONE		NONE	NONE	NONE	NONE	NONE
X X	X X	X	X	X X	X X	X X	X X	X X	X X	X X	X X
ADHESIVE/ SEALANT	ADHESIVE/ SEALANT	ADHESIVE/ SEALANT	ADHESIVE/ SEALANT	ADHESIVE	ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	TAPE/ ADHESIVE	TAPE/ ADHESIVE	TAPE/ ADHESIVE
X X X	X X X	X X	X X	X	CONTACT ADHS	10.5 X X X	10.5 X X	10.5 X X X	10 MECH FAST CONTACT ADHS X	10 MECH FAST CONTACT ADHS X	10 MECH FAST CONTACT ADHS X
NONE	NONE	NONE	NONE	DEAD LEVEL	DEAD LEVEL	LEVEL	DEAD LEVEL	DEAD LEVEL	NONE	NONE	NONE
X X X	X X X	X* X* X*	X* X* X*	X X X	X	X X X	X X X	X X X	X X X	X X X	X X X
X X X SEE SPECS	X X X SEE SPECS	X* X* X* *SEE SPECS	X* X* X* *SEE SPECS	X PLYWOOD, WOOD PLANK SMOOTH BUR	X PLYWOOD, WOOD PLANK SMOOTH BUR	X X X SEE SPECS	X X X SEE SPECS	X X X SEE SPECS	X X X SEE SPECS	X X X SEE SPECS	X X X SEE SPECS
NONE -25 F-180 F	NONE -25 F-180 F	NONE -25 F-180 F	NONE -25 F-180 F	NONE ABOVE 0 F	NONE ABOVE 0 F	NONE	NONE 0 F-120 F	NONE 0 F-120 F	NONE 0 F-160 F	NONE 0 F-160 F	NONE 0 F-160 F
ELASTOFORM	ELASTOFORM	ELASTOFORM	ELASTOFORM	UNCURED NEO	UNCURED NEO	UNCURED	UNCURED EPDM	UNCURED NEOPRENE	UNCURED EPDM OR NEOPRENE	UNCURED EPDM OR NEOPRENE	UNCURED EPDM OR NEOPRENE
ADHESIVE	ADHESIVE	ADHESIVE	ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CEMENT	CONTACT ADHESIVE	CONTACT ADHESIVE	TAPE AND/OR ADHESIVE	TAPE AND/OR ADHESIVE	TAPE AND/OR ADHESIVE
NO	NO	NO	NO	X	X	YES	NO	YES	YES	YES	YES
USA USA	USA USA	USA USA	USA USA	USA USA	USA USA	USA USA	USA USA	USA USA	CANADA CANADA	CANADA CANADA	CANADA CANADA
1963 1963 HARRISBURG	1963 1963 HARRISBURG			1980 LEXINGTON	2965 MISHAWAKA	1981-ADRIAN	1983-TEXAS	1981-ADRIAN	1964 1981-BUFFALO	1964 1982 CLEVELAND	1964 1981-BUFFALO
THOUSANDS	THOUSANDS			200,000	160,000	THOUSANDS	10,000	THOUSANDS	THOUSANDS THOUSANDS	THOUSANDS THOUSANDS	THOUSANDS THOUSANDS
15 X	15 X			5,10 X	5,10 X	15 NO X X	10 NO X	15 NO X X	15 5/10	15 5/10	15 5/10
X SEE SPECS X	X SEE SPECS X	SEE SPECS X	SEE SPECS X	X SEE SPECS	X SEE SPECS	X X X	X X X	X X X	X X X	X X X	X X X
PETROLEUM SEE SPECS	PETROLEUM OILS	PETROLEUM SEE SPECS	PETROLEUM OILS	PETROLEUM OILS	PETROLEUM OILS	SEE MANUFACTURER	SEE MANUFACTURER	SEE MANUFACTURER	HYDROCARBONS	HYDROCARBONS	HYDROCARBONS
DISTRS/REPS	DISTRS/REPS	DISTRS/REPS	DISTRS/REPS	DISTRS/ APPRV CONTRS	DISTRS/ APPRV CONTRS	DISTRIBUTORS	APPROVED CONTRACTORS	APPROVED CONTRACTORS	AGENT/DIRECT	AGENT/DIRECT	AGENT/DIRECT
39 YES	39 YES	39 YES	39 YES	YES	YES	8 YES	8 YES	8 YES	YES	YES	YES
SEMINARS, FIELD, FACTORY	SEMINARS, FIELD, FACTORY	SEMINARS, FIELD, FACTORY	SEMINARS, FIELD, FACTORY	SEMINARS	SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS
H KENNY E KANE	H KENNY E KANE	H KENNY E KANE	H KENNY E KANE	REGIONAL OFF C J KLASEN	REGIONAL OFF C J KLASEN	419-729-3731 419-729-3731	419-729-3731 419-729-3731	419-729-3731 419-729-3731	P HYRSKO D BRAZIER K MCINTYRE	P HYRSKO D BRAZIER K MCINTYRE	P HYRSKO D BRAZIER K MCINTYRE
50	50	50	50	50	50	50	52	50/53	50	50	51

EPDM ETHYLENE PROPYLENE DIENE MONOMER Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	DUNLOP CONSTRUCTION PRODUCTS INC	ERA CORPORATION	ERA CORPORATION	ERA CORPORATION	ERA CORPORATION	EVANITE PERMAGLAS INC	EVANITE PERMAGLAS INC	EVANITE PERMAGLAS INC	EVANITE PERMAGLAS INC
2. PRODUCT NAME	DUNSEAL .060	ERA-EPDM 245 - BLACK	ERA-EPDM 260 - BLACK	ERA-EPDM 245 - WHITE	ERA-EPDM 260 - WHITE	EVANITE PERM GLASS DEPEND MEMB.045 BLK	EVANITE PERM GLASS DEPEND MEMB.060 BLK	EVANITE PERM GLAS DEPEND MEMB.045 WH	EVANITE PERM GLAS DEPEND MEMB.060 WH
3. PRODUCT DESCRIPTION:									
A. REINFORCEMENT	WITHOUT	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
B. COLOR	BLACK	BLACK	BLACK	WHITE	WHITE	BLACK	BLACK	WHITE	WHITE
C. INSTALLED WT (lbs/ft² W/O BALLAST)	.38	.28	.35	.30	.40	.30	.45	.40	.60
4. COATING REQUIRED	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
5. USE: A. NEW ROOFING	X	YES	YES	YES	YES	YES	YES	YES	YES
B. REROOFING	X	YES	YES	YES	YES	YES	YES	YES	YES
6. FIELD LAP JOINT METHOD	TAPE/ ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	JOINT TAPE/ ADHESIVE	JOINT TAPE/ ADHESIVE	JOINT TAPE/ ADHESIVE	JOINT TAPE/ ADHESIVE
7. TYPE OF ROOF SYSTEM:									
A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)	10	X	X	X	X	10	10	10	10
B. PARTIALLY ADHERED (METHOD)	MECH FAST	MECH FAST	MECH FAST	X	X	BATTENS	BATTENS	BATTENS	BATTENS
C. FULLY ADHERED (METHOD)	CONTACT ADHS	CONTACT ADHS	X	X	X	CONTACT ADHV	CONTACT ADHV	CONTACT ADHV	CONTACT ADHV
D. PROTECTED MEMBRANE ROOFING ASSEMBLY	X								
8. MINIMUM SLOPE	NONE	LEVEL	LEVEL	LEVEL	LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
9. USE OVER:									
A. PERLITE	X	X	X	X	X	X*	X*	X*	X*
B. POLYURETHANE	X	X	X	X	X	X*	X*	X*	X*
C. WOOD FIBER	X	X	X	X	X	X*	X*	X*	X*
D. GLASS FIBER	X	X	X	X	X	X*	X*	X*	X*
E. EXPANDED POLYSTYRENE	X	X	X	X	X	X*	X*	X*	X*
F. FELT FACED COMPOSITES	X	X	X	X	X	X*	X*	X*	X*
G. OTHER	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS URATES	*EVANITE FOR APPL METHODS OVER EACH TYPE	*EVANITE FOR APPL METHODS OVER EACH TYPE	*EVANITE FOR APPL METHODS OVER EACH TYPE	*EVANITE FOR APPL METHODS OVER EACH TYPE
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
11. WORKABLE TEMPERATURE RANGE	0 F-160 F	0 F-160 F	0 F-160 F	0 F-160 F	0 F-160 F	-25 F-125 F	-25 F-150 F	-25 F-150 F	-25 F-150 F
12. FLASHING MATERIAL	UNCURED EPDM OR NEOPRENE	UNCURED EPDM	UNCURED EPDM	UNCURED EPDM	UNCURED EPDM	UNCURED EPDM UNCRD NEOPRN	UNCURED EPDM UNCRD NEOPRN	UNCURED EPDM UNCRD NEOPRN	UNCURED EPDM UNCRD NEOPRN
13. FLASHING METHOD	TAPE AND/OR ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	JOINT TAPE ADHV/SEALANT	JOINT TAPE ADHV/SEALANT	JOINT TAPE ADHV/SEALANT	JOINT TAPE ADHV/SEALANT
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	YES					YES	YES	YES	YES
15. COUNTRY: A. ORIGIN	CANADA	USA	USA	USA	USA	USA/JAPAN	USA/JAPAN	USA/JAPAN	USA/JAPAN
B. MANUFACTURE	CANADA	USA	USA	USA	USA	USA/JAPAN	USA/JAPAN	USA/JAPAN	USA/JAPAN
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)	1964	1965	1965	1965	1965	1964	1964	1964	
B. USA (YEAR)(CITY FIRST INSTALLED)	1982 CLEVELAND	MISHAWAKA	MISHAWAKA	MISHAWAKA	MISHAWAKA	1983 CORVALLIS	1983 CORVALLIS	1983 CORVALLIS	1983 CORVALLIS
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN	THOUSANDS	NA	NA	NA	NA	NA	NA	NA	NA
B. USA	THOUSANDS	NA	NA	NA	NA	NA	NA	NA	NA
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)									
A. DURATION (YEARS)	15	5-11-21	21	21	21	5,10	5,10	5,10	5,10
B. RENEWABLE AFTER INSPECTION (YES/NO)									
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY									
C.2 WORKMANSHIP & MAT'L	5/10	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE									
D.2 ORIG. COST OF INSTALT'N	X	X	X	X	X	X	X	X	X
D.3 $ PER SQUARE									
E. EXCLUSION FROM COVERAGE									
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE	HYDROCARBONS	AROMATIC HYDROCARBONS	AROMATIC HYDROCARBONS	AROMATIC HYDROCARBONS	AROMATIC HYDROCARBONS	PETROLEUM OILS	PETROLEUM OILS	PETROLEUM OILS	PETROLEUM OILS
20. METHOD OF DISTRIBUTION	AGENT/DIRECT	DIRECT	DIRECT	DIRECT	DIRECT	DISTRS/ DIRECT/REPS	DISTRS/ DIRECT/REPS	DISTRS/ DIRECT/REPS	DISTRS/ DIRECT/REPS
21. NUMBER OF REGIONAL LOCATIONS						11	11	11	11
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES	YES	YES	YES	YES	YES	YES	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FIELD, SEMINARS	FIELD	FIELD	FIELD	FIELD	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS
24. SALES INFORMATION CONTACT	P HYRSKO	D MISCHO	D MISCHO	D MISCHO	D MISCHO	B HENRY	B HENRY	B HENRY	B HENRY
25. TECHNICAL INFORMATION CONTACT	D BRAZIER K MCINTYRE	R AHREN	R AHREN	R AHREN	R AHREN	J EARLEY	J EARLEY	J EARLEY	J EARLEY
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	51	50	50	53	53	50	50	53	53

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EPDM ETHYLENE PROPYLENE DIENE MONOMER Part 1 *(See Part 2 for Test Results)*

FIRESTONE BUILDING PRODUCTS CO	FIRESTONE BUILDING PRODUCTS CO	GATES ENGINEERING CO,INC	GATES ENGINEERING CO,INC	GOODYEAR TIRE & RUBBER CO	GOODYEAR TIRE & RUBBER CO	GOODYEAR TIRE & RUBBER CO	INT'L RUBBER ROOFING SYSTEMS,INC	INT'L RUBBER ROOFING SYSTEMS,INC	INT'L RUBBER ROOFING SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC
RUBBERGARD .045	RUBBERGARD .060	GATES SYSTEM 1 EPDM-45 MILS	GATES SYSTEM 1 EPDM-60 MILS	VERSIGARD .045	VERSIGARD .060	VERSIGARD .060	INTERNAT'L BLACK	INTERNAT'L WHITE	INTERNAT'L WHITE FIRE RETARDANT	WHALESKIN/81 C-EPDM .045	WHALESKIN/81 WHITE .045 EPDM
NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
BLACK .28	BLACK .38	BLACK .26	BLACK .39	BLACK .28	BLACK .38	WHITE 45	BLACK .30	WHITE .35	WHITE .40	BLACK .31-45 MIL	WHITE .31-45 MIL
NONE	NONE	OPTIONAL	OPTIONAL	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X
CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHV HEAT SEAL	CONTACT ADHV HEAT SEAL	CONTACT ADHV HEAT SEAL	SPLICING CEMENT	SPLICING CEMENT		CONTACT ADHESIVE	CONTACT ADHESIVE
10 BATTENS	10 BATTENS	10 MECH FAST	10 MECH FAST	X	X	X	10 PLATE BOUND	10 PLATE BOUND	PLATE BOUND	X	X
	X	CONTACT ADHV	CONTACT ADHV		X	X	CONT CEMENT	CONT CEMENT	PLATE	X	X
X	X	IRMA	IRMA	X	X	X	X			X	X
DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	NONE	NONE	NONE	DEAD LEVEL	DEAD LEVEL		DEAD LEVEL	DEAD LEVEL
X	X	X	X	X	X	X				X*	X*
X	X	X	X	X	X	X				X*	X*
X	X	X	X	X	X	X				X*	X*
X	X	X	X	X	X	X				X*	X*
X	X	X	X	X	X	X				X*	X*
X	X	X	X	X	X	X				X*	X*
SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	SOME MAY REQUIRE BARRIER SHT	SOME MAY REQUIRE BARRIER SHT	SOME MAY REQUIRE BARRIER SHT	*SEE KES FOR APPL METHODS OR SEE SPECS	*sEE KES FOR APPL METHODS OR SEE SPECS
NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
0 F-100 F	0 F-100 F	50 F-90 F	50 F-90 F	0 F-150 F	0 F-150 F	0 F-150 F	0 F-160 F	0 F-160 F	0 F-160 F	-25 F-180 F	-25 F-180 F
UNCURED NEO	UNCURED NEO	EPDM	EPDM METAL	WINGPRENE	WINGPRENE	WINGPRENE	UNCURED EPDM	UNCURED EPDM	UNCURED EPDM	UNCURED EPDM UNCRD NEOPRN	UNCURED EPDM UNCRD NEOPRN
CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	SPECIAL ADHESIVE	SPECIAL ADHESIVE	SPECIAL ADHESIVE	CONTACT ADHV GUM TAPE	CONTACT ADHV GUM TAPE
YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES
USA	USA	USA	USA	USA	USA	USA	USA	USA	USA	USA	USA
USA	USA	USA	USA	USA	USA	USA	USA	USA	USA	USA	USA
1980 INDIANAPOLIS	1980 INDIANAPOLIS	1979-SIOUX C	1979-SIOUX C	1982 1965 NEW BEDFORD	1982 1965 NEW BEDFORD	1982 1965 NEW BEDFORD	1982 1965 MISHAWAKA	1965 MISHAWAKA	1982 FORT WAYNE	1979 THOMASTON	1982-ORLANDO
MILLIONS	MILLIONS	87,000	34,000	NOT AVAIL NOT AVAIL	NOT AVAIL NOT AVAIL	NOT AVAIL NOT AVAIL	15,000 250,000	50,000	3,000	THOUSANDS	THOUSANDS
10/15	10/15	10	10	10	10	10	10	10	10	21	21
				X	X	X	X	X	X	X	X
X	X						X	X	X	ALSO AVAIL	ALSO AVAIL
X	X	X	X	X	X	X	X	X	X	X	X
							X	X	X	X	X
X	X			X	X	X	X	X	X		
		X	X				X	X	X		
X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X
HYDROC SOLVS SEE SPECS	HYDROC SOLVS SEE SPECS	SEE SPECS	SEE SPECS	CONTACT GOODYEAR	CONTACT GOODYEAR	CONTACT GOODYEAR	AROMATIC HYDROCARBONS	AROMATIC HYDROCARBONS	AROMATIC HYDROCARBONS	PETROLEUM CONTACT SPLR	PETROLEUM CONTACT SPLR
DIRECT/REPS	DIRECT/REPS	DISTR/REPS	DISTR/REPS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	CONTRS/ DISTRS	CONTRS/ DISTRS	CONTRS DISTRS	DISTRIBUTORS	DISTRIBUTORS
45	45	31	31	82	82	82	20	20	20	62	62
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FIELD, SEMINARS	FACTORY	FACTORY	FACTORY	FIELD, FACTORY	FIELD, FACTORY	FIELD, FACTORY	IN FIELD, SEMINARS	IN FIELD, SEMINARS
1-800-428-4442	1-800-428-4442	441-7464	441-7464	1-800-321-1692	1-800-321-1692	1-800-321-1692	R WHITMAN	R WHITMAN	R WHITMAN	T ARRAS A POREMBA	T ARRAS A POREMBA
1-800-428-4511	1-800-428-4511	441-7464	441-7464	1-800-999-0571	1-800-999-0571	1-800-999-0571	R WHITMAN	R WHITMAN	R WHITMAN	T ARRAS A POREMBA	T ARRAS A POREMBA
50	50	50	50	50	50	53	50	54	54	50	54

EPDM ETHYLENE PROPYLENE DIENE MONOMER Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC
2. PRODUCT NAME	WHALESKIN/81 WHITE .045 C-EPDM	WHALESKIN/81 .045 EPDM	WHALESKIN/81 TALC FREE .045 EPDM	WHALESKIN/81 C-EPDM .060	WHALESKIN/81 WHITE .060 EPDM	WHALESKIN/81 GREY .081 EPDM	WHALESKIN/81 WHITE .060 C-EPDM	WHALESKIN/81 EPDM .060	WHALESKIN/81 EPDM .081
3. PRODUCT DESCRIPTION:									
A. REINFORCEMENT	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
B. COLOR	WHITE	BLACK	BLACK	BLACK	WHITE	GREY	WHITE	BLACK	BLACK
C. INSTALLED WT (lbs/ft² W/O BALLAST)	.31-45 MIL	.31-45 MIL	.31-45 MIL	.34-.60 MIL	.34-.60 MIL	.56	.34-.60 MIL	.34-.60 MIL	.56-.81 MIL
4. COATING REQUIRED	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X	X	X
B. REROOFING	X	X	X	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE		
7. TYPE OF ROOF SYSTEM:									
A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)	X	10 MIN	10 MIN	X	X	X	X*	X*	X*
B. PARTIALLY ADHERED (METHOD)	X	X	X	X	X	X	X*	X*	X*
C. FULLY ADHERED (METHOD)	X	X	X	X	X	X	X*	X*	X*
D. PROTECTED MEMBRANE ROOFING ASSEMBLY	X	X	X	X	X	X	X*	X*	X*
8. MINIMUM SLOPE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
9. USE OVER:									
A. PERLITE	X*	X*	X*	X*	X*	X*	X*	X*	X*
B. POLYURETHANE	X*	X*	X*	X*	X*	X*	X*	X*	X*
C. WOOD FIBER	X*	X*	X*	X*	X*	X*	X*	X*	X*
D. GLASS FIBER	X*	X*	X*	X*	X*	X*	X*	X*	X*
E. EXPANDED POLYSTYRENE	X*	X*	X*	X*	X*	X*	X*	X*	X*
F. FELT FACED COMPOSITES	X*	X*	X*	X*	X*	X*	X*	X*	X*
G. OTHER	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
11. WORKABLE TEMPERATURE RANGE	-25 F-180 F	-25 F-180 F	-50 F-220 F	-25 F-180 F	-25 F-180 F	-25 F-180 F	-25 F-180 F	-25 F-180 F	-25 F-180 F
12. FLASHING MATERIAL	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO
13. FLASHING METHOD	CONTACT ADHV GUM TAPE	CONTACT ADHV GUM TAPE	CONTACT ADHV GUM TAPE	CONTACT ADHV GUM TAPE	CONTACT ADHV GUM TAPE	CONTACT ADHV GUM TAPE	CONTACT ADHV GUM TAPE	CONTACT ADHV GUM TAPE	CONTACT ADHV GUM TAPE
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
15. COUNTRY: A. ORIGIN	USA	USA		USA	USA	USA	USA	USA	USA
B. MANUFACTURE	USA	USA	USA/CANADA	USA	USA	USA	USA	USA	USA
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)									
B. USA (YEAR)(CITY FIRST INSTALLED)	1982-ORLANDO	1965 MISHAWAKA	1983	1979 THOMASTON	1965 MISHAWAKA	1965 MISHAWAKA	1965 MISHAWAKA	1965 MISHAWAKA	1965 MISHAWAKA
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN									
B. USA	THOUSANDS	THOUSANDS	THOUSANDS	THOUSANDS	THOUSANDS	THOUSANDS	THOUSANDS	THOUSANDS	THOUSANDS
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)									
A. DURATION (YEARS)	21	21	21	21	21	30	21	21	30
B. RENEWABLE AFTER INSPECTION (YES/NO)	X	X	X	X	X	X	X	X	X
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY	ALSO AVAIL	ALSO AVAIL	ALSO AVAIL	ALSO AVAIL	ALSO AVAIL	ALSO AVAIL	ALSO AVAIL	ALSO AVAIL	ALSO AVAIL
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE	X	X	X	X	X	X	X	X	X
D.2 ORIG. COST OF INSTALT'N									
D.3 $ PER SQUARE									
E. EXCLUSION FROM COVERAGE									
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE	PETROLEUM CONTACT SPLR	PETROLEUM CONTACT SPLR	PETROLEUM CONTACT SPLR	PETROLEUM CONTACT SPLR	PETROLEUM CONTACT SPLR	PETROLEUM CONTACT SPLR	PETROLEUM CONTACT SPLR	PETROLEUM CONTACT SPLR	PETROLEUM CONTACT SPLR
20. METHOD OF DISTRIBUTION	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS
21. NUMBER OF REGIONAL LOCATIONS	62	62	62	62	62	62	62	62	62
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	NO	NO	NO	NO	NO	NO	NO	NO	NO
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FIELD TRAING SEMINARS	FIELD TRAING SEMINARS	FIELD TRAING SEMINARS	FIELD TRAING SEMINARS	FIELD TRAING SEMINARS	FIELD TRAING SEMINARS	FIELD TRAING SEMINARS	FIELD TRAING SEMINARS	FIELD TRAING SEMINARS
24. SALES INFORMATION CONTACT	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA
25. TECHNICAL INFORMATION CONTACT	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA	T ARRAS A POREMBA
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	54	51	51	51	54	54	54	51	51

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EPDM ETHYLENE PROPYLENE DIENE MONOMER Part 1 *(See Part 2 for Test Results)*

KELLY ENERGY SYSTEMS, INC	KENDALL COMPANY	KENDALL COMPANY	KENDALL COMPANY	KENDALL COMPANY	MANVILLE	MANVILLE	PROTECTIVE COATINGS, INC	PROTECTIVE COATINGS, INC	PROTECTIVE COATINGS, INC	PROTECTIVE COATINGS, INC	REEVES BROS
WHALESKIN/81 TALC FREE .060 EPDM	POLYKEN M-45	POLYKEN M-60	POLYKEN MFR-45	POLYKEN MFR-60	SPM 45	SPM 60	SUPEROOF-BLACK	SUPEROOF-WHITE	SUPEROOF-GREY	SUPEROOF WHITE FIRE RETARDANT	REEVETECH .045
NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
BLACK .34-.60 MIL	BLACK .28	BLACK .35	BLACK .28	BLACK .35	BLACK .455	BLACK .255	BLACK .30	WHITE .35	GRAY .35	WH/FIRE RET .40	BLACK .28
NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
TAPE OR ADHESIVE	SEAM TAPE	SEAM TAPE	SEAM TAPE	SEAM TAPE	ADHESIVE/ SEALANT	ADHESIVE/ SEALANT	SPLICING CEMENT	SPLICING CEMENT	SPLICING CEMENT	SPLICING CEMENT	CONTACT ADHESIVE
10 MIN X X X	10 MECH FAST CONT ADHES X	10 MECH FAST CONT ADHES X	10 MECH FAST CONT ADHES X	10 MECH FAST CONT ADHES X	X X X	X X	10 PLATE BOUND CONT CEMENT X	10 PLATE BOUND CONT CEMENT	10 PLATE BOUND CONT CEMENT	PLATE BOUND CONT CEMENT	10
DEAD LEVEL	NONE	NONE	NONE	NONE	NONE	NONE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL		DEAD LEVEL
X* X* X*	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
X* X* X* *SEE KES FOR APPL METHODS OR SEE SPECS	X X X SEE SPECS	X X X SEE SPECS	X X X SEE SPECS	X X X SEE SPECS	X X X SEE SPECS	X X X SEE SPECS	X X X SOME MAY REQUIRE BARRIER SHT	X X X SOME MAY REQUIRE BARRIER SHT	X X X SOME MAY REQUIRE BARRIER SHT	X X X SOME MAY REQUIRE BARRIER SHT	X
NONE -50 F-220 F	NONE 0 F-110 F	NONE 0 F-110 F	NONE 0 F-110 F	NONE 0 F-110 F	NONE 25 F-160 F	NONE 25 F-160 F	NONE 0 F-120 F	NONE 0 F-160 F	NONE 0 F-160 F	NONE 0 F-160 F	NONE 35 F-120 F
UNCURED EPDM UNCURED NEO	UNCURED NEO SLF ADHERING FLASHG TAPE	UNCURED NEO SLF ADHERING FLASHG TAPE	UNCURED NEO SLF ADHERING FLASHG TAPE	UNCURED NEO SLF ADHERING FLASHG TAPE	UNCURED NEO	UNCURED NEO	UNCURED EPDM	UNCURED EPDM	UNCURED EPDM	UNCURED EPDM METAL	UNCURED NEO
CONTACT ADHV GUM TAPE	SLF ADHERING TAPE	SLF ADHERING TAPE	SLF ADHERING TAPE	SLF ADHERING TAPE	ADHESIVE	ADHESIVE	SPLICING/ ADHESIVE	SPLICING ADHESIVE	SPLICING ADHESIVE	SPLICING ADHESIVE	ADHESIVE
YES	NO	NO	NO	NO			YES	YES	YES	YES	NO
USA USA/CANADA	USA USA	USA USA	USA USA	USA USA	USA USA	USA USA	USA USA	USA USA	USA USA	USA USA	USA USA
1983 GREELEY, CO	1982 FRANKLIN, KY	1982 FRANKLIN, KY	1982 FRANKLIN, KY	1982 FRANKLIN, KY	1979-MUNCIE	1979-MUNCIE	1982 1965 MISHAWAKA	1965 MISHAWAKA	1966 SOUTH BEND	1982 FORT WAYNE	1981 WASHINGTON
THOUSANDS	THOUSANDS				THOUSANDS	THOUSANDS	15,000 250,000	300,000	1,000	10,000	
21 X ALSO AVAIL X	10 X	10 X	10 X	10 X	5,10 X	5,10 X	10 X X	UP TO 20 X X	UP TO 20 X X	UP TO 20 X X	10 NO X
X X	X	X	X	X	X	X	X	X	X	X	X
X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
	SEE KENDALL	SEE KENDALL	SEE KENDALL	SEE KENDALL	CONTACT SPLR	CONTACT SPLR	AROMATIC HYDROCARBONS	AROMATIC HYDROCARBONS	AROMATIC HYDROCARBONS	AROMATIC HYDROCARBONS	PETROLEUM SEE SPECS
DISTRIBUTORS	DIRECT	DIRECT	DIRECT	DIRECT	REPS/DISTRS	REPS/DISTRS	CONTR/DISTRS	CONTR/DISTRS	CONTR/DISTRS	CONTR/DISTRS	CONTRACTORS
62 NO	15 YES	15 YES	15 YES	15 YES	YES	YES	10 YES	10 YES	10 YES	10 YES	3 YES
FIELD TRAING SEMINARS	FIELD SEMINARS	FIELD SEMINARS	FIELD SEMINARS	FIELD SEMINARS	SEMINARS FACTORY	SEMINARS FACTORY	FIELD FACTORY	FIELD FACTORY	FIELD FACTORY	FIELD FACTORY	FIELD TRAINING
T ARRAS A POREMBA T ARRAS A POREMBA	K COFFEY DALAINIS	K COFFEY DALAINIS	K COFFEY DALAINIS	K COFFEY DALAINIS	J BUSCH V GRECO	J BUSCH V GRECO	GETTYS H HOWELLS	GETTYS H HOWELLS	GETTYS H HOWELLS	GETTYS H HOWELLS	K SCHWARZ B SMITH
51	51	51	51	51	51	51	51	55	51	55	51

EPDM ETHYLENE PROPYLENE DIENE MONOMER Part 1 *(See Part 2 for Test Results)*

1. COMPANY NAME	REEVES BROS	SYENERGY METHODS, INC	SYENERGY METHODS, INC	SYENERGY METHODS, INC	SYENERGY METHODS, INC	SYENERGY METHODS, INC	WAT PRO, INC	WEATHERGARD ROOFING SYSTEMS, INC	WEATHERGARD ROOFING SYSTEMS, INC
2. PRODUCT NAME	REEVETECH .060	SYENERGY RUBBER ROOF .055 BLACK	SYENERGY RUBBER ROOF .055 WHITE	SYENERGY FIRESTOP .045 MEMB	SYENERGY RUBBER ROOF .045 BLACK	SYENERGY RUBBER ROOF .045 WHITE	AGAPER-E	.045 WEATHERGARD BLACK	.045 WEATHERGARD BLACK FR-1
3. PRODUCT DESCRIPTION:									
A. REINFORCEMENT	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
B. COLOR	BLACK	BLACK	WHITE	BLACK/WH.	BLACK	WHITE	BLACK	BLACK	BLACK
C. INSTALLED WT (lbs/ft² W/O BALLAST)	.37	.35	.40	.25	.25	.28	.31	.28	.28
4. COATING REQUIRED	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X	X	X
B. REROOFING	X	X	X	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	COLD TAPE	CONTACT ADHESIVE	CONTACT ADHESIVE
7. TYPE OF ROOF SYSTEM:									
A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)	10	10 MIN	10 MIN	10 MIN	10 MIN	10 MIN	8	10	10
B. PARTIALLY ADHERED (METHOD)		PLATE BOUND	PLATE BOUND	PLATE BOUND	PLATE BOUND	PLATE BOUND	X	X	X
C. FULLY ADHERED (METHOD)		X	X	X	X	X		X	X
D. PROTECTED MEMBRANE ROOFING ASSEMBLY		X	X	X	X	X		X	X
8. MINIMUM SLOPE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
9. USE OVER:									
A. PERLITE	X	X	X	X	X	X	X	X	X
B. POLYURETHANE	X	X	X	X	X	X	X	X	X
C. WOOD FIBER	X	X	X	X	X	X	X	X	X
D. GLASS FIBER		X	X	X	X	X	X	X	X
E. EXPANDED POLYSTYRENE	X	X	X	X	X	X	X	X	X
F. FELT FACED COMPOSITES		X	X	X	X	X	X	X	X
G. OTHER		SEE SPECS OR TECH BULLETN	SEE SPECS OR TECH BULLETN	SEE SPECS OR TECH BULLETN	SEE SPECS OR TECH BULLETN	SEE SPECS OR TECH BULLETN	POLYSIOCYAN-URATES		
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
11. WORKABLE TEMPERATURE RANGE	35 F-120 F	SEE TECH SVC	SEE TECH SVC	SEE TECH SVC	SEE TECH SVC	SEE TECH SVC	20 F-110 F	.20 F-160 F	20 F-160 F
12. FLASHING MATERIAL	UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	UNCURED EPDM UNCURED NEO	EPDM METAL	UNCURED NEO	UNCURED NEO
13. FLASHING METHOD	ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	TAPE HEAT	CONTACT ADHESIVE	CONTACT ADHESIVE
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	NO	YES	YES	YES	YES	YES	YES	YES	YES
15. COUNTRY: A. ORIGIN	USA	USA	USA	USA	USA	USA	ITALY	USA	USA
B. MANUFACTURE	USA	USA	USA	USA	USA	USA	ITALY	USA	USA
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)							1970	1983-PR	
B. USA (YEAR)(CITY FIRST INSTALLED)	1981 WASHINGTON	1965 MISHAWAKA	1965 MISHAWAKA	1965 MISHAWAKA	1965 MISHAWAKA	1965 MISHAWAKA	NEW JERSEY	1981-MEMPHIS	
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN		6-12 AVAIL	6-12 AVAIL				900,000		
B. USA							3,000		
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)									
A. DURATION (YEARS)	10				6/12/15	6/12/15	5/10	5/10/15	5/10/15
B. RENEWABLE AFTER INSPECTION (YES/NO)	NO						X	X	X
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY					15	15		15	15
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	5/10	5/10
D. MONETARY LIMITATION D.1 NONE									
D.2 ORIG. COST OF INSTALT'N	X	X	X	X	X	X		X	X
D.3 $ PER SQUARE							X		
E. EXCLUSION FROM COVERAGE									
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS
20. METHOD OF DISTRIBUTION	CONTRACTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRS/REPS	DISTRS/REPS
21. NUMBER OF REGIONAL LOCATIONS	3	30	30	30	30	30	7	30	30
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES	YES	YES	YES	YES	YES	YES	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FIELD TRAINING	FIELD SEMINARS	FIELD SEMINARS	FIELD SEMINARS	FIELD SEMINARS	FIELD SEMINARS	SEMINARS	ON SITE SEMINARS	ON SITE SEMINARS
24. SALES INFORMATION CONTACT	K SCHWARZ	D CREED	D CREED	D CREED	D CREED	D CREED	201-528-6727	1-800-USA-EPDM	1-800-USA-EPDM
25. TECHNICAL INFORMATION CONTACT	B SMITH	DONFRANCESCO	DONFRANCESCO	DONFRANCESCO	DONFRANCESCO	DONFRANCESCO	201-528-6727	901-458-2222	901-458-2222
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	51	51	55	55	51	56	51	51	51

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EPDM ETHYLENE PROPYLENE DIENE MONOMER Part 1 *(See Part 2 for Test Results)*

WEATHERGARD ROOFING SYSTEMS, INC	WEATHERGARD ROOFING SYSTEMS, INC	WEATHERGARD ROOFING SYSTEMS, INC	WEATHREGARD ROOFING SYSTEMS, INC	WEATHERGARD ROOFING SYSTEMS, INC
.060 WEATHERGARD BLACK	.045 WEATHERGARD WHITE	.060 WEATHERGARD WHITE	.060 WEATHGD FIREGARD BLACK FR-ULA	.060 WEATHGD FIREGARD WHITE FR-ULA
NONE BLACK .36	NONE WHITE .28	NONE WHITE .36	NONE BLACK .60	NONE WHITE .60
NONE	NONE	NONE	NONE	NONE
			X X	X X
CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE
X X X	X X X	X X X	X X X	X X X
DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
X X X	X X X	X X X	X X X	X X X
X X X	X X X	X X X	X X X	X X X
NONE 20 F-160 F	NONE 20 F-160 F	NONE 20 F-160 F	NONE 20 F-160 F	NONE 20 F-160 F
UNCURED NEO	UNCURED WHITE EPDM	UNCURED WHITE EPDM	UNCURED NEO	UNCURED NEO
CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE
YES	YES	YES	NO	NO
USA USA	USA USA	USA USA	USA USA	USA USA
5/10/15 X 15 5/10	5/10/15 X 15 5/10	5/10/15 X 15 5/10	5/10/15 X 15 5/10	5/10/15 X 15 5/10
X	X	X	X	X
X X	X X	X X	X X	X X
PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS	PETROLEUM SEE SPECS
DISTRS/REPS 30 YES	DISTRS/REPS 30 YES	DISTRS/REPS 30 YES	DISTRS/REPS 30 YES	DISTRS/REPS 30 YES
ON SITE SEMINARS	ON SITE SEMINARS	ON SITE SEMINARS	ON SITE SEMINARS	ON SITE SEMINARS
1-800-USA-EPDM 201-528-2222	1-800-USA-EPDM 201-528-2222	1-800-USA-EPDM 201-528-2222	1-800-USA-EPDM 201-528-2222	1-800-USA EPDM 201-528-2222
51	56	56	51	56

EPDM Part 2: Test Results, Non-Reinforced Black *(See Part 1 for General Information)*

Test Description and Suggested Values As Specified in RMA Document IPR-1/1984

COMPANY NAME		AMERICAN HYDROTECH, INC	AMERICAN HYDROTECH, INC	BARRA CORP OF AMERICA, INC	BARRA CORP OF AMERICA, INC	BARRA CORP OF AMERICA, INC	CARLISLE SYNTEC SYSTEMS	CARLISLE SYNTEC SYSTEMS	CARLISLE SYNTEC SYSTEMS	CARLISLE SYNTEC SYSTEMS
PRODUCT NAME		HYDRO-SEAL .045 BLACK	HYDRO-SEAL .060 BLACK	RUBBERSHIELD 45 BLACK	RUBBERSHIELD 45 BLACK FIRE RATED	RUBBERSHIELD 60 BLACK	SURE-SEAL EPDM .045	SURE-SEAL EPDM .060	SURE-SEAL FR EPDM .045	SURE-SEAL FR EPDM .060
PHYSICAL PROPERTIES (PER RMA DOCUMENT IPR-1/1984)										
1. THICKNESS (MIN, INCHES)	0.040	.043-.048	.058-.063	0.045	0.045	0.060	.045	.060	.045	.060
2. TENSILE STRENGTH (MIN., psi)	1305	1400	1400	1400	1400	1400	1755	1755	1780	1780
3. ELONGATION, ULTIMATE (MIN., %)	300	300	300	300	300	300	520	520	495	495
4. TENSILE SET (MAX., 50% ELONGATION)	10	10	10	3	3	3	0.1	0.1	0.1	0.1
5. TEAR RESISTANCE (MIN., lbf/INCH)	150	150	150	225	200	225	220	220	215	215
6. BRITTLENESS POINT (MAX., °F)	-49	-67	-67	-60	-60	-60	-85	-85	-85	-85
7. LINEAR DIMENSIONAL CHANGE (MAX. %)	±2	+- 2	+- 2	+- 2	+- 2	+- 2	0.5	0.5	0.5	0.5
8. OZONE RESISTANCE	NO CRACKS	X	X	X	X	X	X	X	X	X
9. HEAT AGING: 9.1 TENSILE STRENGTH (MIN., psi)	1205	1205	1205	1205	1205	1205	1600	1600	1800	1800
9.2 ELONGATION, ULTIMATE (MIN.,%)	200	200	200	225	225	225	230	230	230	230
9.3 TEAR RESISTANCE (MIN., lbf/INCH)	125	125	125	150	150	150	200	200	200	200
10. WATER ABSORPTION (MAX., MASS.%)	+8-2	+/-2	+/-2	+1	+1	+1	2.3	2.3	2.3	2.3
11. FACTORY SEAM STRENGTH—	SHEET FAILURE, OR 50 lbf/INCH MIN.	X	X	55	55	55	X	X	X	X
12. ACCELERATED WEATHERING	UNDER STUDY									
13. FOR GENERAL INFORMATION	SEE PAGE(S)	42	42	42	42	42	43	43	43	43

COMPANY NAME		CELOTEX	CELOTEX	DIVERSITECH GENERAL BUILDING SYSTEMS DIV	DIVERSITECH GENERAL BUILDING SYSTEMS DIV	DUNLOP CONSTRUCTION PRODUCTS INC	DUNLOP CONSTRUCTION PRODUCTS INC	ERA CORPORATION	ERA CORPORATION	EVANITE PERMAGLAS INC
PRODUCT NAME		CELO I TY II .060 FULLY ADHERED	CELO I TYP I .045 LOOSE LAID & BALST	GENFLEX ACR .045 BLACK	GENFLEX ACR .060 BLACK	DUNSEAL .045	DUNSEAL .060	ERA-EPDM 245 - BLACK	ERA-EPDM 260 - BLACK	EVANITE PERM GLASS DEPEND MEMB,045 BLK
PHYSICAL PROPERTIES (PER RMA DOCUMENT IPR-1/1984)										
1. THICKNESS (MIN, INCHES)	0.040	.060 +- 10	.045 +- 10	0.045	0.060	0.045	0.060	0.040	0.055	.043-.048
2. TENSILE STRENGTH (MIN., psi)	1305	1400	1400	1350	1350	1650	1650	1485	1485	1400
3. ELONGATION, ULTIMATE (MIN., %)	300	300	300	350	350	510	510	360	360	300
4. TENSILE SET (MAX., 50% ELONGATION)	10	<10	<10	<5.0	<5.0			2	2	5
5. TEAR RESISTANCE (MIN., lbf/INCH)	150	150	150	200	200	185	185	185	185	150
6. BRITTLENESS POINT (MAX., °F)	-49	-60	-60	-67	-67	>-50	>-50	-60	-60	-49
7. LINEAR DIMENSIONAL CHANGE (MAX. %)	±2	<1	<1	<2.0	<2.0	0.5		+- 1	+- 1	+- 2
8. OZONE RESISTANCE	NO CRACKS	X	X	X	X	X	X	X	X	X
9. HEAT AGING: 9.1 TENSILE STRENGTH (MIN., psi)	1205	1200	1200	1260	1260	1700	1700	1400	1400	1205
9.2 ELONGATION, ULTIMATE (MIN.,%)	200	225 MIN	225 MIN	245	245	300	300	210	210	200
9.3 TEAR RESISTANCE (MIN., lbf/INCH)	125	150 MIN	150 MIN	160	160			165	165	125
10. WATER ABSORPTION (MAX., MASS.%)	+8-2	2 MAX	2 MAX	+1.0	+1.0	3.0	3.0	+- 2	+- 2	+8 -2
11. FACTORY SEAM STRENGTH—	SHEET FAILURE, OR 50 lbf/INCH MIN.	X	X	X	X	X	X	X	X	X
12. ACCELERATED WEATHERING	UNDER STUDY									50
13. FOR GENERAL INFORMATION	SEE PAGE(S)	43	43	43	43	43	43	44	44	44

COMPANY NAME		EVANITE PERMAGLAS INC	FIRESTONE BUILDING PRODUCTS CO	FIRESTONE BUILDING PRODUCTS CO	GATES ENGINEERING CO,INC	GATES ENGINEERING CO,INC	GOODYEAR TIRE & RUBBER CO	GOODYEAR TIRE & RUBBER CO	INT'L RUBBER ROOFING SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC
PRODUCT NAME		EVANITE PERM GLAS DEPEND MEMB.060 BLK	RUBBERGARD .045	RUBBERGARD .060	GATES SYSTEM 1 EPDM-45 MILS	GATES SYSTEM 1 EPDM-60 MILS	VERSIGARD .045	VERSIGARD .060	INTERNAT'L BLACK	WHALESKIN/81 C-EPDM .045
PHYSICAL PROPERTIES (PER RMA DOCUMENT IPR-1/1984)										
1. THICKNESS (MIN, INCHES)	0.040	.058-.063	.045	.060			.045	.060		.043
2. TENSILE STRENGTH (MIN., psi)	1305	1400	1650	1650			1690	1690		1400
3. ELONGATION, ULTIMATE (MIN., %)	300	300	450	450			570	570		300
4. TENSILE SET (MAX., 50% ELONGATION)	10	5	<5	<5			<10	<10		
5. TEAR RESISTANCE (MIN., lbf/INCH)	150	150	125	125			180	180		200
6. BRITTLENESS POINT (MAX., °F)	-49	-49	-75	-75			-75	-75		-49
7. LINEAR DIMENSIONAL CHANGE (MAX. %)	±2	+- 2	<2	<2			<2	<2		+- 2
8. OZONE RESISTANCE	NO CRACKS	X	X	X			X	X		X
9. HEAT AGING: 9.1 TENSILE STRENGTH (MIN., psi)	1205	1205	1450	1450			1710	1710		1205
9.2 ELONGATION, ULTIMATE (MIN.,%)	200	200	210	210			380	380		225
9.3 TEAR RESISTANCE (MIN., lbf/INCH)	125	125	175	175			150	150		125
10. WATER ABSORPTION (MAX., MASS.%)	+8-2	+8 -2	<2	<2			+2	+2		+8 -2
11. FACTORY SEAM STRENGTH—	SHEET FAILURE, OR 50 lbf/INCH MIN.	X	X	X			X	X		X
12. ACCELERATED WEATHERING	UNDER STUDY	50								
13. FOR GENERAL INFORMATION	SEE PAGE(S)	44	45	45	45	45	45	45	45	45

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EPDM Part 2: Test Results, Non-Reinforced Black *(See Part 1 for General Information)*

Test Description and Suggested Values As Specified in RMA Document IPR-1/1984

KELLY ENERGY SYSTEMS, INC	KELLY ENERGY SYSTEMS, INC	KELLY ENERGY SYSTEMS, INC	KELLY ENERGY SYSTEMS, INC	KELLY ENERGY SYSTEMS, INC	KELLY ENERGY SYSTEMS, INC	KENDALL COMPANY	KENDALL COMPANY	KENDALL COMPANY	KENDALL COMPANY	MANVILLE	MANVILLE
WHALESKIN/81 .045 EPDM	WHALESKIN/81 TALC FREE .045 EPDM	WHALESKIN/81 C-EPDM .060	WHALESKIN/81 EPDM .060	WHALESKIN/81 EPDM .081	WHALESKIN/81 TALC FREE .060 EPDM	POLYKEN M-45	POLYKEN M-60	POLYKEN MFR-45	POLYKEN MFR-60	SPM 45	SPM 60
.043	.043	.058	.058	.079	.058	.045	.060	.045	.060	.043	.058
1400	1400	1400	1400	1400	1400	1583	1680	1500	1600	1400	1400
300	300	300	300	300	300	390	390	350	350	350	350
						2	2	3	3	10	10
200	200	200	200	200	200	210	235	200	200	150	150
-49	-49	-49	-49	-49	-49	PASS	PASS	PASS	PASS	-75	-75
+- 2	+- 2	+- 2	+- 2	+- 2	+- 2	1.4	.9	1.4	1.0	<1	<1
X	X	X	X	X	X	X	X	X	X	X	X
1205	1205	1205	1205	1205	1205	1350	1460	1300	1400	>1300	>1300
225	225	225	225	225	225	215	225	215	225	225	225
125	125	125	125	125	125	180	165	150	150	>150	>150
+8 -2	+8 -2	+8 -2	+8 -2	+8 -2	+8 -2	1.3	1.5	2.0	2.0	<2	<2
X	X	X	X	X	X					X	X
						58	67	57	65		
46	46	46	46	46	47	47	47	47	47	47	47

PROTECTIVE COATINGS, INC	PROTECTIVE COATINGS, INC	REEVES BROS	REEVES BROS	SYENERGY METHODS, INC	SYENERGY METHODS, INC	WAT PRO, INC	WEATHERGARD ROOFING SYSTEMS, INC	WEATHERGARD ROOFING SYSTEMS, INC	WEATHERGARD ROOFING SYSTEMS, INC	WEATHERGARD ROOFING SYSTEMS, INC
SUPEROOF-BLACK	SUPEROOF-GREY	REEVETECH .045	REEVETECH .060	SYENERGY RUBBER ROOF .055 BLACK	SYENERGY RUBBER ROOF .045 BLACK	AGAPER-E	.045 WEATHERGARD BLACK	.045 WEATHERGARD BLACK FR-1	.060 WEATHERGARD BLACK	.060 WEATHGD FIREGARD BLACK FR-ULA
		.045	.060	.050 MIN	.040 MIN					
		1600	1600	1680	1680					
		450	450	350	350					
				8.7	8.7					
		175	175	171	171					
		-60	-60	-49	-49					
		1	1	-1.4	-1.4					
		X	X	X	X					
		1800	1800	1590	1590					
		250	250	270	270					
		150	150	151	151					
				+5.7	+5.7					
		X	X	X	X					
47	47	47	48	48	48	48	48	48	49	49

EPDM Part 2: Test Results, Fabric-Reinforced Black *(See Part 1 for General Information)*

Test Description and Suggested Values As Specified in RMA Document IPR-2/1984

COMPANY NAME		DUNLOP CONSTRUCTION PRODUCTS INC	DUNLOP CONSTRUCTION PRODUCTS INC
PRODUCT NAME		DUNSEAL .045	DUNSEAL .060
PHYSICAL PROPERTIES (PER RMA DOCUMENT IPR-2/1984)			
1. THICKNESS (MIN., INCHES)	0.040	.045	.060
2. THICKNESS OVER SCRIM (EACH SIDE) (MIN., INCHES)	0.015	.017	.025
3. BREAKING STRENGTH (MIN., lbf)	90	100	100
4. ELONGATION, ULTIMATE (MIN., %)	250	510	510
5. TEARING STRENGTH (MIN., lbf)	10	170	170
6. BRITTLENESS POINT (MAX., °F)	-49	>-50 F	>-50 F
7. LINEAR DIMENSIONAL CHANGE (MAX., %)	±2	.5	.5
8. OZONE RESISTANCE	NO CRACKS	X	X
9. HEAT AGING: 9.1 BREAKING STRENGTH (MIN., %)	80	100	100
9.2 ELONGATION, ULTIMATE (MIN.,%)	200	300	300
10. WATER ABSORPTION (MAX., MASS.%)	+8-2		
11. FACTORY SEAM STRENGTH—	SHEET FAILURE, OR 50 lbf/INCH MIN.	X	X
12. ACCELERATED WEATHERING	UNDER STUDY		
13. FOR GENERAL INFORMATION	SEE PAGE(S)	43	44

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EPDM Part 2: Test Results *(See Part 1 for General Information)*

1. COMPANY NAME		AMERICAN HYDROTECH,INC	AMERICAN HYDROTECH,INC	BARRA CORP OF AMERICA,INC	BARRA CORP OF AMERICA,INC	DIVERSITECH GENERAL BUILDING SYSTEMS DIV
2. PRODUCT NAME		HYDRO-SEAL.045 WHITE	HYDRO-SEAL.060 WHITE	RUBBERSHIELD 60 WHITE	60 WHITE FIRE RATED	GENFLEX ACR.045 WHITE
3. PRODUCT DESCRIPTION		WHITE EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM
4. THICKNESS	METHOD:					
	RESULTS:					
5. TENSILE STRENGTH	METHOD:					
	RESULTS:					
6. LAP JOINT STRENGTH	METHOD:					
	RESULTS:					
7. ELONGATION AT BREAK	METHOD:					
	RESULTS:					
8. TENSILE SET	METHOD:					
	RESULTS:					
9. LOW TEMPERATURE FLEXIBILITY	METHOD:					
	RESULTS:					
10. WATER ABSORPTION	METHOD:					
	RESULTS:					
11. DIMENSIONAL STABILITY AFTER WATER ABSORPTION	METHOD:					
	RESULTS					
12. HEAT AGING	METHOD:					
	RESULTS:					
13. OZONE RESISTANCE	METHOD:					
	RESULTS:					
14. RESISTANCE TO ACCELERATED WEATHERING	METHOD:					
	RESULTS:					
15. DYNAMIC IMPACTING (PUNCTURING)	METHOD:					
	RESULTS:					
16. TEAR RESISTANCE	METHOD:					
	RESULTS:					
17. TEARING STRENGTH	METHOD:					
	RESULTS:					
18. LOW TEMPERATURE IMPACT	METHOD:					
	RESULTS:					
19. PERMEABILITY	METHOD:					
	RESULTS:					
20. DIMENSIONAL CHANGE AFTER STRESS RELAXATION	METHOD:					
	RESULTS:					
21. CONE PENETRATION	METHOD:					
	RESULTS:					
22. FOR GEN'L INFORMATION SEE PAGE(S)		42	42	42	42	43

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EPDM Part 2: Test Results *(See Part 1 for General Information)*

DIVERSITECH GENERAL BUILDING SYSTEMS DIV	ERA CORPORATION	ERA CORPORATION	EVANITE PERMAGLAS INC	EVANITE PERMAGLAS INC	GOODYEAR TIRE & RUBBER CO
GENFLEX ACR.060 WHITE	ERA-EPDM 245 - WHITE	ERA-EPDM 260 - WHITE	PERM GLS DEPEND MEMB.045	PERM GLS DEPEND MEMB.060	VERSIGARD .060
WHITE EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM
	ASTM D412 .040	ASTM D412 .055			
	ASTM D412 1750	ASTM D412 1750			
	ASTM D816 SHEET FAILURE	ASTM D816 SHEET FAILURE			
	ASTM D412 500	ASTM D412 500			
	ASTM D414 4 1/2%	ASTM D414 4 1/2%			
	ASTM D2137 -60	ASTM D2137 -60			
	ASTM D471 48 HRS 3%	ASTM D471 48 HRS 3%			
	ASTM D1149 NO CRACKS	ASTM D1149 NO CRACKS			
43	44	44	44	44	45

EPDM Part 2: Test Results *(See Part 1 for General Information)*

1. COMPANY NAME		INTERNATIONAL RUBBER ROOFING SYSTEMS	INTERNATIONAL RUBBER ROOFING SYSTEMS	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC
2. PRODUCT NAME		INTERNATIONAL WHITE	INT'L WHITE FIRE RETARD.	WHALESKIN/81 WH.045 EPDM	WHALESKIN/81 WH.045C-EPDM	WHALESKIN/81 WH.060 EPDM
3. PRODUCT DESCRIPTION		WHITE EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM
4. THICKNESS	METHOD:			ASTM D751-66	ASTM D751-66	ASTM D751-66
	RESULTS:			.043	.043	.058
5. TENSILE STRENGTH	METHOD:			ASTM D412 DIE C	ASTM D412 DIE C	ASTM D412 DIE C
	RESULTS:			1400	1400	1400
6. LAP JOINT STRENGTH	METHOD:					
	RESULTS:					
7. ELONGATION AT BREAK	METHOD:			ASTM D412 DIE C	ASTM D412 DIE C	ASTM D412 DIE C
	RESULTS:			300% MIN	300% MIN	300% MIN
8. TENSILE SET	METHOD:					
	RESULTS:					
9. LOW TEMPERATURE FLEXIBILITY	METHOD:			ASTM D2137	ASTM D2137	ASTM D2137
	RESULTS:			NO CRACKS	NO CRACKS	NO CRACKS
10. WATER ABSORPTION	METHOD:			ASTM D471	ASTM D471	ASTM D471
	RESULTS:			+8 -2	+8 -2	+8 -2
11. DIMENSIONAL STABILITY AFTER WATER ABSORPTION	METHOD:			ASTM D1204	ASTM D1204	ASTM D1204
	RESULTS			+- 2	+- 2	+- 2
12. HEAT AGING	METHOD:			ASTM D573	ASTM D573	ASTM D573
	RESULTS:			75% MIN	75% MIN	75% MIN
13. OZONE RESISTANCE	METHOD:			ASTM D1149	ASTM D1149	ASTM D1149
	RESULTS:			NO CRACKS	NO CRACKS	NO CRACKS
14. RESISTANCE TO ACCELERATED WEATHERING	METHOD:					
	RESULTS:					
15. DYNAMIC IMPACTING (PUNCTURING)	METHOD:					
	RESULTS:					
16. TEAR RESISTANCE	METHOD:			ASTM D624	ASTM D624	ASTM D624
	RESULTS:			200	200	200
17. TEARING STRENGTH	METHOD:					
	RESULTS:					
18. LOW TEMPERATURE IMPACT	METHOD:					
	RESULTS:					
19. PERMEABILITY	METHOD:			ASTM E96	ASTM E96	ASTM E96
	RESULTS:			.002	.002	.002
20. DIMENSIONAL CHANGE AFTER STRESS RELAXATION	METHOD:					
	RESULTS:					
21. CONE PENETRATION	METHOD:					
	RESULTS:					
22. FOR GEN'L INFORMATION SEE PAGE(S)		45	45	45	46	46

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EPDM Part 2: Test Results *(See Part 1 for General Information)*

KELLY ENERGY SYSTEMS,INC	KELLY ENERGY SYSTEMS,INC	PROTECTIVE COATINGS,INC	PROTECTIVE COATINGS,INC	SYENERGY METHODS,INC	SYENERGY METHODS,INC
WHALESKIN/81 GR.081 EPDM	WHALESKIN/81 WH.060C-EPDM	SUPEROOF-WHITE	SUPEROOF WH FIRE RETARD´T	RUBBER ROOF.055 WHITE	FIRESTOP .045 MEMB
GREY EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM	BLK./WHITE EPDM
ASTM D751-66 .058	ASTM D751-66 .058				
ASTM D412 DIE C 1400	ASTM D412 DIE C 1400			ASTM D412 1400 PSI MIN	ASTM D412 1300 PSI MIN
ASTM D412 DIE C 300% MIN	ASTM D412 300% MIN			ASTM D412 300% MIN	ASTM D412 300% MIN
ASTM D2137 NO CRACKS	ASTM D2137 NO CRACKS			@-60 F ASTM D2137 OK	@-60 F ASTM D2137 OK
ASTM D471 +8 -2	ADTM D471 +8 -2			ASTM D471 VOL CHG AFTER 48 HR @ 212 F 5.0% MAX	ASTM D471 VOL CHG AFTER 48 HR @ 158 F 1.5% MAX
ASTM D1204 +- 2	ASTM D1204 +- 2			28 DAYS @ 212 F LENGTH WIDTH SHRINKAGE 2.0% MAX	28 DAYS @ 212 F LENGTH WIDTH SHRINKAGE 1% MAX
ASTM D573 75% MIN	ASTM D573 75% PROP			RESIST ASTM D573 AGED 7 DAYS @ 250 F 1050 PSI MIN	RESIST ASTM D454 AGED 7 DAYS @ 250 F 900 PSI MIN
ASTM D1149 NO CRACKS	ASTM D1149 NO CRACKS			ASTM D1149 50 PPHM UNDER 20% NO CRACKING	ASTM D1149 50 PPHM UNDER 20% NO CRACKING
ASTM D624 200	ASTM D624 200				
				ASTM D624 DIE C 125 LBS MIN	ASTM D624 DIE C 150 LBS MIN
ASTM E96 .002	ASTM E96 .002			ASTM E96-66 METHOD B+BW .004 MAX	ASTM E96-66 METHOD B+BW .002 MAX
46	46	47	47	48	48

EPDM Part 2: Test Results *(See Part 1 for General Information)*

1. COMPANY NAME		SYENERGY METHODS, INC	WEATHRGARD ROOFING SYSTEMS	WEATHRGARD ROOFING SYSTEMS	WEATHRGARD ROOFING SYSTEMS
2. PRODUCT NAME		RUBBER ROOF.045 WHITE	.045 WEATHERGARD WHITE	.060 WEAHTERGARD WHITE	.060 FIREGARD WH FR-ULA
3. PRODUCT DESCRIPTION		WHITE EPDM	WHITE EPDM	WHITE EPDM	WHITE EPDM
4. THICKNESS	METHOD:				
	RESULTS:				
5. TENSILE STRENGTH	METHOD:	ASTM D412			
	RESULTS:	1400 PSI MIN			
6. LAP JOINT STRENGTH	METHOD:				
	RESULTS:				
7. ELONGATION AT BREAK	METHOD:	ASTM D412			
	RESULTS:	300% MIN			
8. TENSILE SET	METHOD:				
	RESULTS:				
9. LOW TEMPERATURE FLEXIBILITY	METHOD:	@-60% ASTM D2157			
	RESULTS:	OK			
10. WATER ABSORPTION	METHOD:	ASTM D471 VOL CHG AFTER 48 HR @ 158 F			
	RESULTS:	5.0% MAX			
11. DIMENSIONAL STABILITY AFTER WATER ABSORPTION	METHOD:	28 DAYS @ 212 F			
	RESULTS	LENGTH WIDTH SHRINKAGE 2% MAX			
12. HEAT AGING	METHOD:	RESIST ASTM D573			
	RESULTS:	AGED 7 DAYS @ 250 F 1050 PSI MIN			
13. OZONE RESISTANCE	METHOD:	ASTM D1149 50 PPHM			
	RESULTS:	UNDER 20% NO CRACKING			
14. RESISTANCE TO ACCELERATED WEATHERING	METHOD:				
	RESULTS:				
15. DYNAMIC IMPACTING (PUNCTURING)	METHOD:				
	RESULTS:				
16. TEAR RESISTANCE	METHOD:				
	RESULTS:				
17. TEARING STRENGTH	METHOD:	ASTM D624 DIE C			
	RESULTS:	125 LBS MIN			
18. LOW TEMPERATURE IMPACT	METHOD:				
	RESULTS:				
19. PERMEABILITY	METHOD:	ASTM E96-66			
	RESULTS:	METHOD B+BW .004 MAX			
20. DIMENSIONAL CHANGE AFTER STRESS RELAXATION	METHOD:				
	RESULTS:				
21. CONE PENETRATION	METHOD:				
	RESULTS:				
22. FOR GEN'L INFORMATION SEE PAGE(S)		48	49	49	49

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Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 1 *(See Part 2 for Test Results)*

	NEOPRENE Polychloroprene					CSPE HYPALON			
1. COMPANY NAME	CARLISLE SYNTEC SYS	GATES ENG CO,INC	GATES ENG CO,INC	WEATHERGARD ROOFING SYSTEMS INC	WEATHERGARD RFG SYS,INC	BARRA CORP OF AMERICA INC	BURKE RUBBER COMPANY	BURKE RUBBER COMPANY	CENTRAL STATES ASSOC CORP
2. PRODUCT NAME	SURE-SEAL NEO	GATES SYS II NEOPRENE-BLACK	GATES SYS II NEOPRENE-GREY	WEATHERGARD NEOPRENE.045	WEATHERGARD NEOPRENT.060	HY-SHIELD	BURKELINE M-341	BURKELINE M-356	CSPE HYPALON UNIROOF 035
3. PRODUCT DESCRIPTION: A. REINFORCEMENT	NONE	NONE	NONE	NONE	NONE	POLYESTER	POLYESTER FIBER	MF BACKING	NONE
B. COLOR	GREY/BLACK	BLACK	GREY	BLACK	BLACK	WHITE	WHITE	WHITE	ALL COLORS
C. INSTALLED WT (lbs/ft² W/O BALLAST)	.46	.45	.45			30	.25	.31	.25
4. COATING REQUIRED	NONE		X	NONE	NONE	NONE	NONE	NONE	NONE
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X	X	X
B. REROOFING	X	X	X	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD	ADHESIVE/ SEALANT	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	SOLVENT/ HEAT	SOLVENT HEAT WELD	SOLVENT HEAT WELD	HEAT WELD
7. TYPE OF ROOF SYSTEM: A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)	X					10-15	10	10	
B. PARTIALLY ADHERED (METHOD)		MECH FAST	MECH FAST			MECH FAST	MECH FAST		
C. FULLY ADHERED (METHOD)	X	CONT ADHES	CONT ADHES			X		LATEX ADHES	LATEX ADHES
D. PROTECTED MEMBRANE ROOFING ASSEMBLY	X					X	X	X	
8. MINIMUM SLOPE	NONE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
9. USE OVER: A. PERLITE	X	X	X	X	X	X	X		
B. POLYURETHANE	X	X	X	X	X	X	X		X
C. WOOD FIBER	X	X	X	X	X	X	X		X
D. GLASS FIBER	X	X	X	X	X	X	X		X
E. EXPANDED POLYSTYRENE	X	X	X	X	X	X	X		X
F. FELT FACED COMPOSITES	X	X	X	X	X	X	X		X
G. OTHER	SEE SPECS	SEE SPECS	SEE SPECS	CONSULT WEATHERGARD TECHNICAL SERVICES	CONSULT WEATHERGARD TECHNICAL SERVICES	ISOCYANURATE EXTRUDED POLYESTYRENE	SEE SPECS	SEE SPECS	EXISTING ROOF
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
11. WORKABLE TEMPERATURE RANGE	-25 F-180 F	50 F-90 F	50 F-90 F			0 F-120 F	0 F-120 F	0 F-120 F	10 F-120 F
12. FLASHING MATERIAL	ELASTOFORM	UNCURED NEO	UNCURED NEO	UNCURED NEO	UNCURED NEO	REINFORECED HYPALON COATED METAL	BURKELINE HYPALON	BURKELINE HYPALON	HYPALON
13. FLASHING METHOD	ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	CONTACT ADHESIVE	SOLVENT/HEAT WELD/ ADHESIVE	SOLVENT/HEAT WELD TO SELF	CONT ADHV TO OTHER SUBSTR	CEMENT
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	YES	NO	NO	NO	NO		YES	YES	YES
15. COUNTRY: A. ORIGIN	USA	USA	USA	USA	USA	USA	USA	USA	UK
B. MANUFACTURE	USA	USA	USA	USA	USA	USA	USA	USA	UK
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)	1960	'73-SAUDI AR	'73-SAUDI AR				1982	1982	1963
B. USA (YEAR)(CITY FIRST INSTALLED)	1960-CARLISLE	1961-WASH DC	1961-WASH DC			1984-GARLAND	1976	1976	1978-LAVERNE
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN		77M BLK+GR	77M BLK+GR						400,000
B. USA	THOUSANDS	200 M BLK+GR	200 M BLK+GR						7,400
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)									
A. DURATION (YEARS)	10	10	10	10	10	5/10	10	10	10
B. RENEWABLE AFTER INSPECTION (YES/NO)				NO	NO				YES
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY									
C.2 WORKMANSHIP & MAT'L	X	X	X	X	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE									X
D.2 ORIG. COST OF INSTALT'N	X			X	X	X	X	X	
D.3 $ PER SQUARE		X	X						
E. EXCLUSION FROM COVERAGE									
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	SEE LIT'ATRE	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE	SEE LITRATRE	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	NONE
20. METHOD OF DISTRIBUTION	DISTRS/REPS	DISTRS/REPS	DISTRS/REPS	DISTRS/REPS	DISTRS/REPS	DIRECT TO CONTRACTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS
21. NUMBER OF REGIONAL LOCATIONS	39	31	31	25	25	8	3	3	6
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES	YES	YES	YES	YES	YES	YES	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FLD,SEMIN-ARS,FACTORY	FIELD, SEMINARS	FIELD, SEMINARS	ONSITE SEMINARS	ONSITE SEMINARS	FACTORY & FIELD	FIELD	FIELD	FIELD
24. SALES INFORMATION CONTACT	H KENNY	800-441-7464	800-441-7464	800-USA-EPDM	800-USA-EPDM	CUSTOMER SERVICE	D BARTLETT	D BARTLETT	J HAUER
25. TECHNICAL INFORMATION CONTACT	E KANE	800-441-7464	800-441-7464	901-458-2222	901-458-2222	TECHNICAL SERVICES	R WOODLEY	R WOODLEY	J WHITTEMORE
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	61	61	61	61	61	62	62	62	62

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Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 1 *(See Part 2 for Test Results)*

OTHER SINGLE-PLY

	CSPE HYPALON								
1. COMPANY NAME	CENTRAL STATES ASSOC CORP	CENTRAL STATES ASSOC CORP	CONKLIN COMPANY INC	DUNLOP CONSTRUCTION PRODUCTS INC	GATES ENGINEERING COMPANY INC	KELLY ENERGY SYSTEMS INC	KELLY ENERGY SYSTEMS INC	KELLY ENERGY SYSTEMS INC	KELLY ENERGY SYSTEMS INC
2. PRODUCT NAME	CSPE HYPALON UNIROOF 040	CSPE HYPALON UNIROOF 048	MASTER BOND	DUNSEAL HYPALON	GATES SYSTEM III HYPALON 45 MILS	GREAT WHITE .036 HYPALON WHITE	GREAT WHITE .036 HYPALON BLACK	GREAT WHITE 045 HYPALON WHITE	GREAT WHITE 045 HYPALON BLACK
3. PRODUCT DESCRIPTION: A. REINFORCEMENT	NONE	NONE	NONE	POLYESTER	YES	YES	YES	YES	YES
B. COLOR	ALL COLORS	ALL COLORS	WHITE	ALL COLORS	WHITE	WHITE	BLACK	WHITE	BLACK
C. INSTALLED WT (lbs/ft² W/O BALLAST)			.24	.30-.40	.30	.30	.40	.40	.40
4. COATING REQUIRED	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
5. USE: A. NEW ROOFING	X	X	YES	YES	X	X	X	X	X
B. REROOFING	X	X	YES	YES	X	X	X	X	X
6. FIELD LAP JOINT METHOD	HEAT WELD	HEAT WELD	HEAT WELD	HEAT OR ADHESIVE	HEAT SEALED	SOLV/HEAT WELD/ADHES	SOLV/HEAT WELD/ADHES	SOLV/HEAT WELD/ADHES	SOLV/HEAT WELD/ADHES
7. TYPE OF ROOF SYSTEM: A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)				10		10	10	10	10
B. PARTIALLY ADHERED (METHOD)				MECH FAST	MECH FAST	X	X	X	X
C. FULLY ADHERED (METHOD)	LATEX ADHES	LATEX ADHES	YES	ADHESIVE		X	X	X	X
D. PROTECTED MEMBRANE ROOFING ASSEMBLY				YES		X	X	X	X
8. MINIMUM SLOPE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	NONE	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
9. USE OVER: A. PERLITE			X*	X	X	X*	X*	X*	X*
B. POLYURETHANE	X	X	X	X	X	X*	X*	X*	X*
C. WOOD FIBER	X	X	X	X	X	X*	X*	X*	X*
D. GLASS FIBER	X	X	X	X	X	X*	X*	X*	X*
E. EXPANDED POLYSTYRENE	X	X	X*	X	X	X*	X*	X*	X*
F. FELT FACED COMPOSITES	X	X	X	X	X	X*	X*	X*	X*
G. OTHER	EXISTING ROOF	EXISTING ROOF	*APPROVAL OF CONKLIN PROD SVCS DEPT	SEE SPECS	SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS	*SEE KES FOR APPL METHODS OR SEE SPECS
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
11. WORKABLE TEMPERATURE RANGE	10 F-120 F	10 F-120 F	40 F-120 F	0 F-160 F	50 F-90 F	-25 F-150 F	-25 F-150 F	-25 F-150 F	-25 F-150 F
12. FLASHING MATERIAL	HYPALON	HYPALON	HYPALON	UNREINFORCED HYPALON	UNCURED	HYPALON	HYPALON	HYPALON	HYPALON
13. FLASHING METHOD	CEMENT	CEMENT	ADHESIVE WELD WELD	ADHESIVE OR HEAT WELD	CONTACT ADHESIVE	SOLVENT HEAT WELD ADHESIVE	SOLVENT HEAT WELD ADHESIVE	SOLVENT HEAT WELD ADHESIVE	SOLVENT HEAT WELD ADHESIVE
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	YES	YES	NO	NO	NO				
15. COUNTRY: A. ORIGIN	UK	UK	USA	CANADA	USA	USA	USA	USA	USA
B. MANUFACTURE	UK	UK	PROPRIETARY	CANADA	USA	USA	USA	USA	USA
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)				1972					
B. USA (YEAR)(CITY FIRST INSTALLED)		1983-SANTA ANA	1983-MINNEAPOLIS	1980-TENNESSEE	1984-YUMA	1983-WATERBURY	1983-WATERBURY	1983-WATERBURY	1983-WATERBURY
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN				THOUSANDS					
B. USA			15,000	THOUSANDS	3,000				
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)									
A. DURATION (YEARS)	10	10	10	15	15	21	21	21	21
B. RENEWABLE AFTER INSPECTION (YES/NO)	YES	YES							
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY						ALSO AVAIL	ALSO AVAIL	ALSO AVAIL	ALSO AVAIL
C.2 WORKMANSHIP & MAT'L	X	X	YES	5-10	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE	X	X	X			X	X	X	X
D.2 ORIG. COST OF INSTALT'N				X					
D.3 $ PER SQUARE					VARIABLE				
E. EXCLUSION FROM COVERAGE									
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE	NONE	NONE	SEE SPECS	NONE	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS	SEE SPECS
20. METHOD OF DISTRIBUTION	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	AGENT/DIRECT	DISTR/REPS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS	DISTRIBUTORS
21. NUMBER OF REGIONAL LOCATIONS	6	6	14		31	62	62	62	62
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES	YES	YES	YES				
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FIELD	FIELD	FIELD, SEMINARS, FACTORY	FIELD SEMINARS	FIELD SEMINARS	FIELD SEMINARS	FIELD SEMINARS	FIELD SEMINARS	FIELD SEMINARS
24. SALES INFORMATION CONTACT	J HAUER	J HAUER	612/831-4044	P HYRSKO	800-441-7464	T ARRAS	T ARRAS	T ARRAS	T ARRAS
25. TECHNICAL INFORMATION CONTACT	J WHITTEMORE	J WHITTEMORE	612/831-4044	D BRAZIER	800-441-7464	A POREMBA	A POREMBA	A POREMBA	A POREMBA
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	62	63	63	63	63	63	63	64	64

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Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 1 *(See Part 2 for Test Results)*

CSPE HYPALON				PIB Polyisobutylene			CPE Chlorinated Polyethylene				
KELLY ENERGY SYSTEMS INC	PANTASOTE, INC	J P STEVENS	TREMCO INC	AGR COMPANY	REPUBLIC POWDERED METALS	TROPICAL INDUSTRIAL COATINGS INC	ALKOR-DIVISION HEDWIN CORP	ALKOR-DIVISION HEDWIN CORP	ALKOR-DIVISION HEDWIN CORP	COOLEY ROOFING SYSTEMS INC	PANTASOTE INC
GREAT WHITE HYPALON CUSTOM	FLEXHIDE HYPALON	HI-TUFF	TREMCO HHP	ALPHAGARD	GEOFLEX	TROPIGARD	ALKORFLEX 35093	ALKORFLEX 35094	ALKORFLEX 35096	COOL TOP 40	FLEXHIDE CPE
YES	POLYESTER	10 X 10 POLYESTER	WOVEN POLYESTER	60 MIL PIB 40 ML FLEECE	POLYESTER	60 MIL PIB 40 MIL FLEECE	NONE	POLYESTER FLEECE	POLYESTER FIBER	POLYESTER	POLYESTER
CUSTOM .30-.40	WHITE .31	WHITE .29 MIN	WHITE .26	BLK OR WHITE .57	BLK/WHITE .57	BLK OR WHITE .57	LIGHT GREY .30	LIGHT GREY .30	LIGHT GREY .30	WHITE .31	WHITE .30
NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
SOLV/HEAT WELD/ADHES	SOLVENT/ HEAT	HEAT WELD	CONT ADHES	PRE-FAB SEAM	SELF-SEALING	SELF-SEALING	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT	HEAT	SOLVENT/ HEAT
10 X X X	MECH FAST	10 MECH FAST X	 X X	10 ASPHALT/ADHV ASPHALT ADHV X	12 X X	10 ASPH/ADHES ASPH/ADHES X	10 X	 X X 	10 X	X	MECH FASTN'D
DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
X* X* X*	X X X	X X X	 X X	X X X	X X X	X X X	X X X	 X	X X X	X X 	X X X
X* X* X* *SEE KES FOR APPL METHODS OR SEE SPECS	X X X ISOCYANURATE EXTRUDED POLYSTRENE	X X* X ISOCYANURATE SMOOTH ASPHT CONSULT JPS	X X* X ISOCYANURATE FIBRGLS *EPS FIBERB ONLY	X X RECOV BOARD EXIST'G ROOF SEE SPECS	X X X SEE SPECIFI-CATIONS	X X RECOV'Y BRD EXISTING SMOOTH AGAINST BUR	X X X EXTRUDED POLYSTRENE ISOCYANURATE	X X ISOCYANURATE EXISTING SMOOTH BUR	X X X ISOCYANURATE EXTRUDED POLYSTRENE	X X X EXTRUDED POLYSTYRENE, ISOCYANURATE	X X X EXTRUDED POLYSTYRENE, ISOCYANURATE
NONE -25 F-150 F	NONE 0 F-120 F	NONE -25 F-140 F	NONE 20 F-160 F	NONE 20 F & ABOVE	NONE 20 F-100 F	NONE 20 F-100 F	NONE 0 F-115 F	NONE 0 F-115 F	NONE 0 F-115 F	NONE 0 F-120 F	NONE 0 F-120 F
HYPALON	SELF OR CPE COATED METAL	REIN HYP NON-REIN HYP	REINFORCED HYPALON	PIB U60 AND COVER TAPE	PIB	UNBACKED PIB	CPE COATED METAL 35093	CPE COATED METAL 35093	CPE COATED METAL 35093	COOL TOP 40 & CPE COATED METAL	SELF OR CPE COATED METAL
SOLVENT HEAT WELD ADHESIVE	SOLVENT/ HEAT	ADHESIVE & HEAT WELD	ADHESIVES-INSTALLATION SPECS	SOLV/WELD & SLF ADHERING	SOLVENT & ADHESIVE	SOLVENT/ WELD	SOLVENT/ HEAT	SOLVENT/ HEAT	SOLVENT/ HEAT	HEAT	SOLVENT/ HEAT
	YES	X	YES	YES	YES	YES	YES	YES	YES	YES	YES
USA USA	USA USA	USA USA	USA USA	W GERMANY USA	W GERMANY USA	GERMANY USA	BELGIUM BELGIUM	BELGIUM BELGIUM	BELGIUM BELGIUM	USA USA	USA USA
1983- WATERBURY	1982- LOVELAND	1977 1978- CHICAGO	1982- CLEVELAND	1950 1977- ST LOUIS	1950 1977- ST LOUIS	1950 1978-AMSTER-DAM,NY	1973 1979- MADISON	1976 1980- ST LOUIS	1974 1979- MADISON	1978- NEWARK	1982- STANHOPE
		100'S/1000'S		13,000,000 1,750,000	9,000,000 200,000	8,500,000 >200,000	>250,000 >50,000	>100,000 >30,000	>250,000 >100,000	250,000	50,000
21 ALSO AVAIL	5 OR 10 NO	10	10 NO	5 OR 10 NO	5 OR 10 YES	10	10 CONT'T ALKOR	10 CONT'T ALKOR	10 CONT'T ALKOR	10	5 OR 10
X	X	X	X	X	X	X	X	X	X	X	X
X	X X	X	X		X	X	X	X	X	X	X X
X X	X X	X X	X X	X X	X X X	X X	X X	X X	X X	X X	X X
SEE SPECS	SEE SPECS	SEE SPECS		CONTACT MANUFACTURER	YES SEE LITERATURE	YES SEE SPECS	FEW SEE SPECS	FEE SEE SPECS	FEE SEE SPECS	CONSULT COOLEY	SEE SPECS
DISTRIBUTORS	LIC CONTRS	DISTRIBUTORS	SALES REPS	DISTRS/REPS	MFGR/REPS	DISTRS/REPS	MFRS/REPS	MFRS/REPS	MFRS/REPS	MFRS/REPS	LICENSED CONTRS ONLY
62	1 YES	24 YES	18 YES	2 YES	4 YES	2 YES	YES	YES	YES	2 YES	YES 1
FIELD SEMINARS	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS, FACTORY	FIELD	YES	FIELD, SEMINARS, FACTORY	YES	ON JOB TRAINING	ON JOB TRAINING	ON JOB TRAINING	FIELD, SEMINARS	FIELD, SEMINARS, FACTORY
T ARRAS A POREMBA	J COPPOLA L KAMP	B ABBOTT J DEMPSEY	P MITCHELL BROZOZOWSKI	C KELLAR W H HUHN	J CHEW J CHEW	J MATHEWS R UTZLER	OFFICE OFFICE	OFFICE OFFICE	OFFICE OFFICE	OFFICE OFFICE	J COPPOLA L KAMP
64	64	64	65	65	65	65	65	65	66	66	66

Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 1 *(See Part 2 for Test Results)*

	OTHER FABRICATED SHEET APPLIED MEMBRANES						
1. COMPANY NAME	BOND COTE SYSTEMS	DURO-LAST ROOFING INC	OTTO FABRIC INC	PANTASOTE INC	SEAL DRY/ USA INC	SEAL DRY/ USA INC	SEAMAN CORP
2. PRODUCT NAME	BOND GREY 35	DURO-LAST	OTTO SINGLE-PLY STR	FLEXHIDE HY-PALON/CPE COMPOSITE	SEAL-DRY SYS 7000	SEAL-DRY SYS 5000	FIBERTITE
3. PRODUCT DESCRIPTION: A. REINFORCEMENT	WOVEN POLYESTER	REINFORCED POLYESTER	WOVEN FIBERGLASS	POLYESTER	POLYESTER	POLYESTER	REINFORCED POLYESTER
B. COLOR	GREY	WHITE	WHITE	WHITE	WHITE	WHITE	BEIGE
C. INSTALLED WT (lbs/ft² W/O BALLAST)	.22	.21	.19	.34	.25	.25	.25
4. COATING REQUIRED	NONE	NONE	NONE	NONE	NONE	NONE	NONE
5. USE: A. NEW ROOFING	X	X	X	X	X	X	X
B. REROOFING	X	X	X	X	X	X	X
6. FIELD LAP JOINT METHOD	HEAT WELD	HEAT GUN	AIR CURE	SOLVENT/ HEAT	HEAT WELD	HEAT WELD	HEAT WELD
7. TYPE OF ROOF SYSTEM: A. LOOSE LAID/BALLASTED (BALLAST:lbs/ft²)	X	X			X	X	
B. PARTIALLY ADHERED (METHOD)	MECHANICALLY	MECHANICALLY		MECH FASTN'D	MECH FASTND	MECH FASTND	MECH FASTND
C. FULLY ADHERED (METHOD)		X	X		X	X	
D. PROTECTED MEMBRANE ROOFING ASSEMBLY							
8. MINIMUM SLOPE	DEAD LEVEL	ANY	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL	DEAD LEVEL
9. USE OVER: A. PERLITE	X	X		X	X	X	X
B. POLYURETHANE	X	X		X	X	X	X
C. WOOD FIBER	X	X		X	X	X	X
D. GLASS FIBER	X	X		X	X	X	X
E. EXPANDED POLYSTYRENE	X	X	X	X*	X	X	X
F. FELT FACED COMPOSITES	X	X		X	X	X	X
G. OTHER	PHENOLIC ISOCYANURATE		EXTRUDED POLYSTYRENE ISOCYANURATE	ISOCYANURATE EXTRUDED POLYSTYRENE	X	X	CHECK WITH MANUFACTURER
10. RESTRICTED REGIONS (REFER TO MFRS LITERATURE)	NONE	NONE	NONE	NONE	NONE	NONE	NONE
11. WORKABLE TEMPERATURE RANGE	-30 F-180 F	-30 F-160 F	NO RESTR'NS	0 F-120 F	-30 F-160 F	-30 F-160 F	-30 F-160 F
12. FLASHING MATERIAL	SAME MATERIALS	ROOF MATERIAL	SAME MAT'LS SIL'NE CAULK	SELF OR CPE COATED METAL	ROOF MEMBRANE	ROOF MEMBRANE	ROOF MEMBRANE
13. FLASHING METHOD	HEAT WELD	HEAT WELD	AIR CURE	SOLVENT/ HEAT	HEAT WELD	HEAT WELD	HEAT WELD
14. PRE-FORMED ACCESSORIES AVAILABLE YES/NO	YES	YES	NOT NEC'Y	YES	YES	YES	YES
15. COUNTRY: A. ORIGIN	USA	USA	USA	USA	USA	USA	USA
B. MANUFACTURE	USA	USA	USA	USA	USA	USA	USA
16. YEAR FIRST COMMERCIAL USE: A. FOREIGN (YEAR)							1974
B. USA (YEAR)(CITY FIRST INSTALLED)	1981	1978-SAGINAW	1979-KANSAS CITY	1983-MARTH-A'S VINEYARD	1983-MICHIGAN	1984-CLEVELAND	1968-SARASOTA
17. NO. OF SQUARES INSTALLED (1 SQ. = 100ft²) A. FOREIGN		NONE					10,000
B. USA	CONFIDENTIAL	>200,000	20,000		20,000	10,000	THOUSANDS
18. WARRANTY (SEE MFRS LITERATURE TO DETERMINE EXACT TERMS, LIMITATIONS, EXCLUSIONS & REMEDIES)							
A. DURATION (YEARS)	10	20	10	5 OR 10	15	10	10
B. RENEWABLE AFTER INSPECTION (YES/NO)	5	NO		NO	NO	NO	
C. SCOPE OF COVERAGE C.1 MATERIAL ONLY		LAST 10 YRS					
C.2 WORKMANSHIP & MAT'L	X	FIRST 10 YRS	X	X	X	X	X
D. MONETARY LIMITATION D.1 NONE			X	X	X	X	
D.2 ORIG. COST OF INSTALT'N		X		X			X
D.3 $ PER SQUARE	X						
E. EXCLUSION FROM COVERAGE							
E.1 DAMAGE TO OTHER BUILDING COMPONENTS	X	X	X	X	X	X	X
E.2 CONSEQUENTIAL DAMAGES	X	X	X	X	X	X	X
19. LIMITATIONS OR RESTRICTED USE	SEE SPECS	NONE	SEE SPECS	SEE SPECS	NONE	NONE	SEE SPECS
20. METHOD OF DISTRIBUTION	REPS	REPS/ DEALERS	DISTR/ REPS	LICENSED CONTRS ONLY	REPS/ INSTALLERS	REPS/ INSTALLERS	DIRECT
21. NUMBER OF REGIONAL LOCATIONS		2		YES			3
22. LICENSED APPLICATOR AGREEMENT (YES/NO)	YES	YES	YES	1	YES	YES	YES
23. APPLICATOR TRAINING (FIELD, SEMINARS, FACTORY)	FIELD, SEMINARS	SEMINARS, FLD FACTORY	YES	FIELD, SEMINARS FACTORY	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS, FACTORY	FIELD, SEMINARS, FACTORY
24. SALES INFORMATION CONTACT	R SCHAUFFELE	B FREDERICK	D BADER	J COPPOLA	B SHROYER	B SHROYER	S EISENTROUT
25. TECHNICAL INFORMATION CONTACT	D HAYES	J BURT	J SWEENEY	L KAMP	C BOWLBY	C BOWLBY	S EISENTROUT
26. FOR TECHNICAL INFORMATION SEE PAGE(S)	66	66	67	67	67	67	67

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Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 2: Test Results *(See Part 1 for General Information)*

	NEOPRENE Polychloroprene				
1. COMPANY NAME	CARLISLE SYNTEC SYSTEMS	GATES ENGINEERING CO INC	GATES ENGINEERING CO INC	WEATHERGARD ROOFING SYSTEMS, INC	WEATHERGARD ROOFING SYSTEMS, INC
2. PRODUCT NAME	SURE-SEAL NEO	GATES SYS II NEOPRENE-BL	GATES SYS II NEOPRENE-GR	WEATHRG´D NEOPRENE .045	WEATHRG´D NEOPRENE .060
3. PRODUCT DESCRIPTION					
4. THICKNESS METHOD: / RESULTS:					
5. TENSILE STRENGTH METHOD: / RESULTS:					
6. LAP JOINT STRENGTH METHOD: / RESULTS:					
7. ELONGATION AT BREAK METHOD: / RESULTS:					
8. TENSILE SET METHOD: / RESULTS:					
9. LOW TEMPERATURE FLEXIBILITY METHOD: / RESULTS:					
10. WATER ABSORPTION METHOD: / RESULTS:					
11. DIMENSIONAL STABILITY AFTER WATER ABSORPTION METHOD: / RESULTS					
12. HEAT AGING METHOD: / RESULTS:					
13. OZONE RESISTANCE METHOD: / RESULTS:					
14. RESISTANCE TO ACCELERATED WEATHERING METHOD: / RESULTS:					
15. DYNAMIC IMPACTING (PUNCTURING) METHOD: / RESULTS:					
16. TEAR RESISTANCE METHOD: / RESULTS:					
17. TEARING STRENGTH METHOD: / RESULTS:					
18. LOW TEMPERATURE IMPACT METHOD: / RESULTS:					
19. PERMEABILITY METHOD: / RESULTS:					
20. DIMENSIONAL CHANGE AFTER STRESS RELAXATION METHOD: / RESULTS:					
21. CONE PENETRATION METHOD: / RESULTS:					
22. FOR GEN'L INFORMATION SEE PAGE(S)	57	57	57	57	57

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Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 2: Test Results *(See Part 1 for General Information)*

		CSPE HYPALON				
1. COMPANY NAME		BARRA CORP OF AMERICA INC	BURKE RUBBER COMPANY	BURKE RUBBER COMPANY	CENTRAL STATES ASSOC CORP	CENTRAL STATES ASSOC CORP
2. PRODUCT NAME		HY-SHIELD	BURKELINE M-341	BURKELINE M-356	UNIROOF 035	UNIROOF 040
3. PRODUCT DESCRIPTION		CSPE HYPALON	POLYESTER REINFORCED CSPE	CSPE W/M.F. BACKING	CSPE HYPALON	CSPE HYPALON
4. THICKNESS	METHOD:		ASTM D751	ASTM D412		
	RESULTS:	0.045 IN	36 MILS NOMINAL	40 MILS NOMINAL		
5. TENSILE STRENGTH	METHOD:		ASTM D751,GRAB METHOD	ASTM D882		
	RESULTS:		155 X 158 LBS	24 X 17 LBS/INCH WIDTH		
6. LAP JOINT STRENGTH	METHOD:		ASTM D751,GRAB METHOD	ASTM D3083,PARA 9.3		
	RESULTS:		123 LBS	15 LBS/INCH WIDTH		
7. ELONGATION AT BREAK	METHOD:	ASTM D751 (FABRIC REINFORCEMENT)	ASTM D751,GRAB METHOD	ASTM D882		
	RESULTS:	25%	103 X 90%	400 X 590 %		
8. TENSILE SET	METHOD:		NA			
	RESULTS:					
9. LOW TEMPERATURE FLEXIBILITY	METHOD:	D2136	ASTM D2136	NA		
	RESULTS:	PASS 40 F	-40 F			
10. WATER ABSORPTION	METHOD:		ASTM D741,7 DAYS @ 70 F	ASTM D471,7 DAYS @ 70 F		
	RESULTS:		5%	5%		
11. DIMENSIONAL STABILITY AFTER WATER ABSORPTION	METHOD:					
	RESULTS					
12. HEAT AGING	METHOD:		ASTM D573,14 DAYS @ 212 F	ASTM D573,14 DAYS @ 212 F		
	RESULTS:		TENSILE 100%,ELONG 60%	TENSILE 100%,ELONG 60%		
13. OZONE RESISTANCE	METHOD:	D1149 100 DAYS @30PPHM @104 F & 30% ELONGATION	ASTM D1149,100PPHM,1/8" BENTLOOP 7 DAYS @ 104 F	ASTM D1149,100 PPHM @20% STRAIN 7 DAYS @104 F		
	RESULTS:	NO CRACKS	NO CRACKS @ 7X	NO CRACKS @ 7X		
14. RESISTANCE TO ACCELERATED WEATHERING	METHOD:		ASTM E838	ASTM E838		
	RESULTS:		>1 MILLION LANGLEYS	>1 MILLION LANGLEYS		
15. DYNAMIC IMPACTING (PUNCTURING)	METHOD:	FTM 191 B METHOD 2031	FTMS 101C,METHOD 2031	FTMS 101C,METHOD 2031		
	RESULTS:	200 LBS	151 LBS	51 LBS		
16. TEAR RESISTANCE	METHOD:	D751	NA	ASTM D1004,DIE C		
	RESULTS:	90 LBS/IN		7/6 LBS		
17. TEARING STRENGTH	METHOD:		ASTM D751,TONGUE METHOD	NA		
	RESULTS:		47/58 LBS			
18. LOW TEMPERATURE IMPACT	METHOD:		ASTM D2137	ASTM D1790		
	RESULTS:		-40 F	-40 F		
19. PERMEABILITY	METHOD:		ASTM E96	ASTM E96		
	RESULTS:		3X10X(-3) METRIC PERM-CM	3X10X(-3) METRIC PERM-CM		
20. DIMENSIONAL CHANGE AFTER STRESS RELAXATION	METHOD:		ASTM D1204 1 HR @ 212 F	ASTM D1204 15 MIN @ 212 F		
	RESULTS:		1.5%	1.0%		
21. CONE PENETRATION	METHOD:					
	RESULTS:					
22. FOR GEN'L INFORMATION SEE PAGE(S)		57	57	57	57	58

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Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 2: Test Results *(See Part 1 for General Information)*

CSPE HYPALON					
CENTRAL STATES ASSOC CORP	CONKLIN COMPANY INC	DUNLOP CONSTRUCTION PRODUCTS, INC	GATES ENGINGEERING COMPANY, INC	KELLY ENERGY SYSTEMS, INC	KELLY ENERGY SYSTEMS, INC
UNIROOF 048	MASTERBOND	DUNSEAL HYPALON H301	SYSTEM III HYP 45 MILS	GREAT WH. HYP .036 WH	GREAT WH. HYP .045 WHITE
CSPE HYPALON	CSPE	CSPE HYPALON			
	CALIPER 35 MILS				
	ASTM D412 1250 PSI	ASTM D412 1500 PSI		ASTM D412 1500	ASTM D412 1500
		ASTM D816 EXCEEDS PARENT MATERIAL			
	ASTM D412 600%	ASTM D412 300%		A.ASTM D751-FABRIC B.MATERIAL A.30% B.300%	ASTM D751 FABRIC 30% MIN MATERIAL 300%
	ASTM D2136,180 F MANDREL -40 F	ASTM D2136 -45 F NO CRACKS		ASTM D2136 -45 F	ASTM D2136 -45 F
		ASTM D570 <2%			
		ASTM D 570 NO CHANGE			
		ASTM D753, D412 RETAINS 100% PROPERTYS		ASTM D753(D412) 100%	ASTM D753(D412) 100%
	ASTM D1149 PASS	ASTM D1149 NO EFFECT		ASTM D1149 NO EFFECT	ASTM D1149 NO EFFECT
	ASTM 6-53 10,000 HRS	10 YR PANAMA PASS,CGSB TESTING IN PROGRESS		E838, 1.5 LANGLEYS PASS	E838 PASS
		FTMS 101B METHOD 2031 200 LBS		FTM 101B METHOD 2031 200 LBS	FTM 101B METHOD 2031 200 LBS
		A.ASTM D751,TONGUE B.ASTM D1004 A.100 LBS MIN B.289 LBS MIN		ASTM D751 90 LBS	ASTM D751 90 LBS
		ASTM D751,TONGUE METHOD 90 LBS			
	ASTM D 1790 -30 F	ASTM D2136 -45 F NO CRACKS			
	ASTM E96B .78 ENGLISH PERMS	ASTM E96 <2.0 PERM			
		ASTM 1204 < +- 10%			
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Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 2: Test Results *(See Part 1 for General Information)*

		CSPE HYPALON				
1. COMPANY NAME		KELLY ENERGY SYSTEMS, INC	KELLY ENERGY SYSTEMS, INC	KELLY ENERGY SYSTEMS, INC	PANTASOTE, INC	J P STEVENS
2. PRODUCT NAME		GREAT WH HYP .036 BLACK	GREAT WH HYP .045 BLACK	GREAT WH HYP CUSTOM	FLEXHIDE HYPALON	HI-TUFF
3. PRODUCT DESCRIPTION					REINFORCED CSPE	POLYESTER REINFORCED CSPE
4. THICKNESS	METHOD:				ASTM D751	ASTM D751
	RESULTS:				0.045 INCHES	45 MILS NOMINAL
5. TENSILE STRENGTH	METHOD:	ASTM D412	ASTM D412	ASTM D412	ASTM D751,GRAB METHOD	ASTM D751,GRAB METHOD
	RESULTS:	1500	1500	1500	250 LBS	225 LBS MIN
6. LAP JOINT STRENGTH	METHOD:				ASTM D751,MODIFIED GRAB METHOD	
	RESULTS:				90% OF MATERIAL BREAKING STRENGTH	
7. ELONGATION AT BREAK	METHOD:	ASTM D751	ASTM D751	ASTM D751	ASTM D751	ASTM D412
	RESULTS:	FABRIC 30% MIN MATERIAL 300%	FABRIC 30% MIN MATERIAL 300%	FABRIC 30% MIN MATERIAL 300%	25%	35% REINFORCED 550% NON-REINFORCED
8. TENSILE SET	METHOD:					
	RESULTS:					
9. LOW TEMPERATURE FLEXIBILITY	METHOD:	ASTM D2136	ASTM D2136	ASTM D2136	ASTM D2136	ASTM D2136,1/8" MANDREL
	RESULTS:	-45 F	-45 F	-45 F	-40 F,PASS	-40 F C,PASS
10. WATER ABSORPTION	METHOD:					ASTM D570
	RESULTS:					1.0%
11. DIMENSIONAL STABILITY AFTER WATER ABSORPTION	METHOD:				ASTM D1204,176 F,30 MIN	ASTM D570
	RESULTS				.05%	NO CHANGE
12. HEAT AGING	METHOD:	ASTM D753(D412)	ASTM D753(D412)	ASTM D753(D412)	ASTM D751 176 F - 7 DAYS	ASTM D573,7 DAYS @ 200 F
	RESULTS:	100%	100%	100%	100% BREAKING STRENGTH RETAINED	100% STRENGTH RETENTION
13. OZONE RESISTANCE	METHOD:	ASTM D1149	ASTM D1149	ASTM D1149		ASTM D1149,3PPM@30% STRAIN,@104 F,72+2500 HRS
	RESULTS:	NO EFFECT	NO EFFECT	NO EFFECT		NO EFFECT
14. RESISTANCE TO ACCELERATED WEATHERING	METHOD:	E838	E838	E838	A.ASTM D1499 B.ASTM E838	ASTM E838
	RESULTS:	PASS	PASS	PASS	A.10,000 HRS B.2,234,000 LANGLEYS	>3 MILLION LANGLEYS
15. DYNAMIC IMPACTING (PUNCTURING)	METHOD:	FTM 101B METHOD 2031	FTM 101B METHOD 2031	FTM 101B METHOD 2031		FTM 191B,METHOD 2031
	RESULTS:	200 LBS	200 LBS	200 LBS		200 LBS
16. TEAR RESISTANCE	METHOD:	ASTM D751	ASTM D751	ASTM D751		ASTM D751,TONGUE TEAR
	RESULTS:	90 LBS	90 LBS	90 LBS		90 LBS MIN
17. TEARING STRENGTH	METHOD:				ASTM D751,TONGUE TEAR 8" X 8" SPECIMEN	ASTM D751,TONGUE TEAR
	RESULTS:				110 LBS	90 LBS MIN
18. LOW TEMPERATURE IMPACT	METHOD:				ASTM D746	ASTM D2136
	RESULTS:				50 F,PASS	-40 F,NO CRACKS
19. PERMEABILITY	METHOD:				ASTM E96	ASTM E96 PROC BW
	RESULTS:				0.04 PERMS	0.49 PERMS
20. DIMENSIONAL CHANGE AFTER STRESS RELAXATION	METHOD:				ASTM D1204,176 F,72 HRS	ASTM D1204
	RESULTS:				0.5%	1.0%
21. CONE PENETRATION	METHOD:					
	RESULTS:					
22. FOR GEN'L INFORMATION SEE PAGE(S)		58	58	59	59	59

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Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 2: Test Results *(See Part 1 for General Information)*

CSPE HYPALON	PIB Polyisobutylene			CPE Chlorinated Polyethylene	
TREMCO INC	AGR COMPANY	REPUBLIC POWERED METALS	TROPICAL INDUSTRIAL COATINGS, INC	ALKOR DIV-HEDWIN CORP	ALKOR DIV-HEDWIN CORP
TREMCO HHP	ALPHAGARD 100S/D	GEOFLEX	TROPIGARD	ALKORFLEX 35093	ALKORFLEX 35094
WOVEN POLYESTER	PIB BLACK OR WHITE	PIB	PIB	CPE CHLORINATED POLYETHYLENE	CPE CHLORINATED POLYETHYLENE
ASTM D751 .052 IN	ASTM D3767 100 MIL +-5%	ASTM D3767 100 MIL +-5%	ASTM D3767 0.100 MIL +- 5%	ASTM D3083 44 MIL	ASTM D3083 40 MIL + FLEECE
ASTM D751 250-300 LBF	ASTM D751 GRAB 200 LBF	ASTM D412 800 PSI	ASTM D751 GRAB (POUNDS-FORCE) 200 LBF	ASTM D412 2000 PSI MD & XD	ASTM D412 2000 PSI MD & XD
ASTM D413 15 LBF	ASTM D751 90 LBS	ASTM D751 56 LBS	ASTM D751(POUNDS/2") 90 LBS	ASTM D412 >95% MD & XD	ASTM D412 >95% MD & XD
ASTM D751 25	ASTM 751 GRAB 70%	ASTM D412 530%	ASTM D751 GRAB 70%	ASTM D412 >400% MD & XD	ASTM D412 >400% MD & XD
NA		ASTM D395,METHOD B 91.5%	ASTM D395,METHOD B 91.5%	ASTM D412 <5.0% VARIATION	ASTM D412 <5.0% VARIATION
ASTM D2136 -40 TO -45	ASTM D2136,-40 F/-40 C SATISFACTORY, 3 OF 3 PASSED	ASTM D2136 -40 F	ASTM D2136,-40 F/-40 C SATISFACTORY,3 OF 3 PASSED	MANDREL TEST -40 F	MANDREL TEST -40 F
ASTM D471 7 DAYS@72 F <5	ASTM D570 0.17%@640 HRS	ASTM D570 0.17%,@640 HRS	ASTM D570 0.032%	ASTM D2842 <1.0%	ASTM D2842 <1.0%
		NA	NA-NO WATER ABSORPTION	ASTM D1204 <2%	ASTM D1204 <1%
ASTM D573 250-300 LBF	ASTM D412 TYPICAL VALUE RETAIN 75% AFTER 155 HRS@158 F	ASTM D412 75% MIN RETENTION AFTER 155 HRS@158 F	ASTM D573 AFTER 6 HRS 2.3% LOSS@376 F	CBSB STANDARD 37-GP-56M, TEST 2,TEST 4&DELAMINATN PASSED	CGSB STANDARD 37-GP-56M, TEST 2,TEST 4&DELAMINATN PASSED
ASTM D1149 PASS	DIN 4102(NO US TEST) EXCELLENT	DIN 4102,NO US TEST EXCELLENT	DIN 4102,NO US TEST EXCELLENT	ASTM D3041,100 HRS PASSED	ASTM D3041,100 HRS PASSED
	ASTM G23 XENON ARC TEST PASSED 16,000 HRS	ASTM G23 XENON ARC TEST PASSED 16,000 HRS	US TESTING 15,000 HRS	XENON 1200 DIN 53387 XENON 150 DIN 53387 20,000 HRS,NO CHANGE	XENON 1200 DIN 53387 XENON 150 DIN 53387 20,000 HRS,NO CHANGE
FTMS 101-2031 200 LBS AVG	FTMS 191(METHOD 5120) 208.4 LBS	FTMS 191,METHOD 5120 208.4 LBS	FTMS 191,METHOD 5120 208.4 LBS		
		ASTM D624 120 LBS/IN THICKNESS	NA	ASTM D624 >335 LBS/IN MD & XD	ASTM D624 >335 LBS/IN MD & XD
ASTM D751 60-75 LBF	ASTM D751,TONGUE TEAR 30 LBF	ASTM D751,TONGUE TEAR 42 LBS	ASTM D751,TONGUE TEAR (POUNDS FORCE) 30 LBF		
ASTM 746B -45 F	ASTM D2136,-1/8" MANDREL NO CRACKS @ -40 F	ASTM D2136,-1/8" MANDREL NO CRACKS @ -40 F	ASTM D2136,-1/8" MANDREL NO CRACKS @ -30 F	ASTM D746 -50 F	ASTM D746 -50 F
ASTM E96 PROC BW(PERMS) 0.05	ASTM E96 0.01 PERM	ASTM E96,PROCEDURE A GMS/24 HR/IN2 0.112 WVT	ASTM E96 0.01 PERM	ASTM E96,PROCEDURE E @ 100 F 0.6 G/MXMD	ASTM E96,PROCEDURE E @ 100 F 0.6 G/MXMD
ASTM D1204 1 HR@ 212 F 0.1-0.4%	ASTM D1204 -0.4%	ASTM D1204 -0.1%	ASTM D1204 -0.4%	ASTM D1204,6 HRS@176 C <+-2.0%	ASTM D1204,6 HRS@176 C <+-1.0%
				DIN 53443,BLATT 2, D=1.5MM 1600 N@+23 C	DIN 53443,BLATT 2, D=1.5MM 1600 N@+23 C
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Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 2: Test Results *(See Part 1 for General Information)*

		CPE Chlorinated Polyethylene			OTHER FABRICATED SHEET APPLIED MEMBRANES	
1. COMPANY NAME		ALKOR DIV-HEDWIN CORP	COOLEY ROOFING SYSTEMS	PANTASOTE INC	BOND COTE SYSTEMS	DURO-LAST ROOFING INC
2. PRODUCT NAME		ALKORFLEX 35096	COOL TOP 40	FLEXHIDE CPE	BOND GREY 35	DURO-LAST
3. PRODUCT DESCRIPTION		CPE CHLORINATED POLYETHYLENE	CPE CHLORINATED POLYETHYLENE	CPE CHLORINATED POLYETHYLENE	NITRITE ALLOY	TRIMERIC POLYMER COATED POLYESTER
4. THICKNESS	METHOD:	ASTM D3083	ASTM D374,METHOD A	ASTM D751	ASTM D3083	ASTM D751
	RESULTS:	44 MILS	40 MILS	0.045 IN	0.35 IN	35 MILS
5. TENSILE STRENGTH	METHOD:	ASTM D412	ASTM D882	ASTM D751,GRAB METHOD	A.ASTM D751,GRAB METHOD B.ASTM D882	ASTM D751,GRAB METHOD
	RESULTS:	2200 PSI MD & XD	2500 PSI	250 LBS	A.390 X 415 LBS B.7500 PSI	380 X 345 LBS
6. LAP JOINT STRENGTH	METHOD:	ASTM D412	ASTM D751	ASTM D751,MODIFIED GRAB METHOD	ASTM D751	ASTM D751
	RESULTS:	>95% MD & XD	95% OF MATERIAL BREAKING STRENGTH	92% OF MATERIAL BREAKING STRENGTH	350 LBS	350 LBS
7. ELONGATION AT BREAK	METHOD:	ASTM D1682	ASTM D751	ASTM D751	ASTM D751	ASTM D751
	RESULTS:	>15% MD & XD	27%	25%	28%	27%
8. TENSILE SET	METHOD:	ASTM D412				
	RESULTS:	<5.0% VARIATION				
9. LOW TEMPERATURE FLEXIBILITY	METHOD:	MANDREL TEST	MIL C-20696B	ASTM D2136	ASTM D2136	ASTM D2136
	RESULTS:	-40 F	-40 F	-40 F,PASS	-30 F,NO CRACKS	-30 F,NO CRACKS
10. WATER ABSORPTION	METHOD:	ASTM D2842	ASTM D2842-69,MODIFIED			
	RESULTS:	<1.0%	0.2%			
11. DIMENSIONAL STABILITY AFTER WATER ABSORPTION	METHOD:	ASTM D1204		ASTM D1204,176 F,30 MIN		
	RESULTS	<0.5%		0.5%		
12. HEAT AGING	METHOD:	CBSB STANDARD 37-GP-56M, TEST 2,TEST 4&DELAMINATN	ASTM D751	ASTM D751,AFTER 7 DAYS @ 176 F	176 F,7 DAYS	176 F,7 DAYS
	RESULTS:	PASSED	100% OF BREAKING STRENGTH	RETAINS 100% BREAKING STRENGTH	RETAINS 95% OF TENSILE STRENGTH	RETAINS 95% OF TENSILE STRENGTH
13. OZONE RESISTANCE	METHOD:	ASTM D3041,100 HRS			ASTM D1149,100 PPHM,1/8", 104 F,1/8" BENT LOOP	ASTM D1149,100 PPHM,1/8", 104 F-7 DAYS
	RESULTS:	PASSED			NO CRACKS,7X	NO CRACKS,7X
14. RESISTANCE TO ACCELERATED WEATHERING	METHOD:	XENON 1200 DIN 53387 XENON 150 DIN 53387	A.TWIN CARBON ARC FED 195 B.DESERT SUN ASTM E838	A.ASTM D1499 B.ASTM 3838	FS191,METHOD 5804,CARBON & W/WATER SPRAY 5,000 HRS	A.FS 191,MET 5804,CARBON B.ASTM E838
	RESULTS:	20,000 HRS,NO CHANGE	A.15,000 HRS B.3 YRS	A.10,000 HRS B.2234000 LANGLEYS	NO CRACKING	A.NO CRACKING 6000 HRS B.1,200,000 LANGLEYS
15. DYNAMIC IMPACTING (PUNCTURING)	METHOD:	FM SIMULATED HAIL			FS101B,METHOD 2031	FS101B,METHOD 2031
	RESULTS:	PASSED			250 LBS	250 LBS
16. TEAR RESISTANCE	METHOD:	ASTM D624	ASTM D2262			ASTM 751,TONGUE
	RESULTS:	>335 LBS/IN MD & XD	WARP 60 LBS FILL 85 LBS		SAME AS TEAR STRENGTH	90 X 90 LBS
17. TEARING STRENGTH	METHOD:			ASTM D751,TONGUE TEAR 8" X 8" SPECIMEN	ASTM D751,8"X10" SAMPLE	ASTM D751,TONGUE
	RESULTS:			100 LBS	100 X 90 LBS	90 X 90 LBS
18. LOW TEMPERATURE IMPACT	METHOD:	ASTM D746		ASTM D746	ASTM D2136,-30 F	
	RESULTS:	-60 F		-50 F PASS	NO CRACKING	
19. PERMEABILITY	METHOD:	ASTM E96,PROCEDURE E @ 100 F	ASTM E96	ASTM E96	PERMEANCE,ASTM E96, METHOD A	A.ASTM 396,PROC B B.ASTM E96,WVT,PROC B,M A
	RESULTS:	0.6 G/MXMD	1.62 PERMS	0.04 PERMS	0.379 US PERMS	A.0.151 G/HR B.0.151G/HR/MXM
20. DIMENSIONAL CHANGE AFTER STRESS RELAXATION	METHOD:	ASTM D1204,6 HRS @176 F	ASTM D1204	ASTM D1204,176 F,72 HRS		
	RESULTS:	<+0.5%	LESS THAN 1.0%	0.5%		
21. CONE PENETRATION	METHOD:	DIN 53443,BLATT 2, D=1.5MM				
	RESULTS:	1500 N@+23 C				
22. FOR GEN'L INFORMATION SEE PAGE(S)		59	59	59	60	60

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Other Single-Ply Pre-Fabricated Sheet Applied Membranes, Part 2: Test Results *(See Part 1 for General Information)*

OTHER FABRICATED SHEET APPLIED MEMBRANES

OTTO FABRIC INC	PANTASOTE INC	SEAL DRY/USA INC	SEAL DRY/USA INC	SEAMAN CORP
OTTO SINGLE-PLY	FLEXHIDE HYPALON/CPE	SEAL DRY SYS 7000	SEAL DRY SYS 5000	FIBERTITE
SILICONE FIBERGLASS	REINFORCED CSPE/CPE	POLYESTER REINFORCED CPA	POLYESTER REINFORCED CPA	POLYESTER REINFORCED EIP
ASTM D1777-64 29 MILS	ASTM D751 0.045 INCHES 0.050 INCHES	FS 191,METHOD 5030.2 ASTM D751 40 MIL MIN	FS 191,METHOD 5030.2 ASTM D751 36 MIL MIN	ASTM D3083 30 MILS MIN
ASTM D579-66 20,000 PSI	ASTM D751,GRAB METHOD 270 LBS	A.ASTM D751,GRAB METHOD B.ASTM D882 A.450 X 380 LBS B.7450 PSI	A.ASTM D751,GRAB METHOD B.ASTM D882 A.315 X 325 LBS B.7450 PSI	A.ASTM D882 B.ASTM D751,GRAB METHOD A.8500 PSI B.375 LBS X 350 LBS
	ASTM D751,MODIFIED GRAB METHOD 90% OF MATERIAL BREAKING STRENGTH	ASTM D751 >300 LBS	ASTM D751 >300 LBS	ASTM D751 >300 LBS
ASTM D412,DIE C 280%	ASTM D751 25%	ASTM D751 30% x 40%	ASTM D751 30% X 35%	ASTM D751 20% WARP,30% FILL
ASTM D2176-69 MOD,180 DEGREE BEND @ 80 DEGREE NO CRACKS	ASTM D2136 -40 F,PASS	ASTM D2136,-30 F, 1/8" MANDREL NO CRACKS	ASTM D2136,-30 F, 1/8" MANDREL NO CRACKS	ASTM D2136 -30 F,NO CRACKS
24 HR TEST NO CHANGE		ASTM D570@70 F, @122 F,48 HRS 1.5% MAX,2.0% MAX	ASTM D570@70 F, @122 F,48 HRS 1.5%/2.0% MAX	SHELTERRITE WATER WICKING TEST,24 HRS 1/8" MAX
24 HR TEST NO CHANGE	ASTM D1204,176 F,30 MIN 0.5%	ASTM D570 NO CHANGE	ASTM D570 NO CHANGE	SHELTERRITE WATER WICKING TEST,24 HRS LESS THAN 0.2%
	ASTM D751,176 F-7DAYS 100% BREAKING STRENGTH RETAINED	14 DAYS@175 F 100% STRENGTH RETAINED NO CRACKING,CRAZING,BLIST	14 DAYS@175 F 100% STRENGTH RETAINED NO CRACKING,CRAZING,BLIST	160 F-7 DAYS >95% STRENGTH RETENTION
		NA		3 DAYS@100PPHM-100 F &3 DAYS@300PPHM-100 F NO CRACKING
ATLAS & Q-PANEL WEATHEROMETER 32,970 HRS,NO CHANGE	A.ASTM D1499 B.ASTM E838 A.10,000 HRS B.2,234,000 LANGLEYS	A.ASTM D2565 WEATHER˜MTR B.ASTM E838(DSET) A.8000 HRS B.1,500,000 LANGLEYS	A.ASTM D2565 WEATHER˜MTR B.ASTM E838(DSET) A.8000 HRS B.1,500,000 LANGLEYS	CARBON ARC WEATHEROMETER W/WATER SPRAY,10,000 HRS NO CRACKING
FTM 191-5122-2 775 LBS		FS 101B,METHOD 2031 275 LBS	FS 101B,METHOD 2031 230 LBS	FS 101B,METHOD 2031 250 LBS
FTM 191-5136 60 LBS X 33 LBS		FS 191,METHOD 5134, ASTM D751,8"X8" SAMPLE 130 LBS	FS 191,METHOD 5134, ASTM D751,8"X8" SAMPLE 110 LBS	ASTM D751,8"X10" SAMPLE 100 LBS
	ASTM D751,TONGUE TEAR 8" X 8" SPECIMEN 110 LBS	FS 191,METHOD 5134, ASTM D751,8"X8" SAMPLE 130 LBS	FS 191,METHOD 5134, ASTM D751,8"X8" SAMPLE 110 LBS	ASTM D751,8"X10" SAMPLE 100 LBS
ASTM D2176-69 MOD NO CRACKING	ASTM D746 -50 F PASS	ASTM D2136 -30 F NO CRACK	ASTM D2136 -30 F NO CRACK	ASTM D2136,-30 F NO CRACKING
ASTM E96-66,METHOD B 7.2	ASTM E96 0.035 PERMS	ASTM E96,PROC A .8 G/MXM/24H	ASTM E96,PROC A .8 G/MXM/24H	WATER VAPOR TRANSMISSION, ASTM E96,PROC A 1.3 G/MXM/24H
	ASTM D1204,176 F,72 HRS 0.5%			37-GP-54M SHALL NOT CHANGE MORE THAN 0.24
				37-GP-54M PASS
60	60	60	60	60

APPENDIX: Roofing Membranes

1. ALLROOF INTERNATIONAL, INC.
BELROOF SD-4, BELROOF SD-4M, BELROOF SBS-4, BELROOF SBS-4M

Easy: It takes just a torch, gloves, knife, and trowel to apply the Belroof modified bitumen roofing system. What roof could be easier to apply?

Cost: The simple equipment required and the easy application makes the Belroof system less labor intensive.

Warranty: The Belroof system has proven itself throughout the world. ALLROOF INTERNATIONAL, INC., is the only manufacturer to offer a warranty that covers damage below the roof level for a full ten years.

Application: The substrate must be checked and approved for application. Substrates may be primed, insulated, a base sheet applied, or a combination of these methods may be used depending on the desired specification. Rolls should be laid from the low side when working up the slopes. Water will flow across and not against the seams. On roofs with a 3 in 12 pitch or greater, the rolls may be applied with the slope. Belroof membranes may be applied using hot asphalt or a propane roofing torch, which is available from ALLROOF INTERNATIONAL, INC. Slopes from dead level to vertical are acceptable. Belroof membranes may be fully adhered, partially adhered, or loosely laid. Both end and side laps should have a minimum 3" lap and must always be torched. Special care must be taken around roof penetrations and flashings. Belroof membranes shall not be applied when precipitation is immiment or during periods of precipitation. The roof surface shall be free of ponded water, ice, snow, etc. to eliminate future condensation problems. Applications below a workable temperature range need special consideration.

Contact ALLROOF INTERNATIONAL, INC., at (801) 973-2400 for specifications.

ALLOOF INTERNATIONAL, INC.
ALLROOF POLYPREN

Application: The substrate must be checked and approved for application. Substrates may be primed, insulated, a base sheet applied, or a combination of these methods may be used depending on the desired specification. Rolls should be laid from the low side working up the slopes. Water will flow across and not against the seams. On roofs with a 3 in 12 pitch or greater, the rolls may be applied with the slope. Allroof Polypren may be fully adhered using hot asphalt, partially adhered using hot asphalt or mechanical fasteners, or loosely laid with ballast. Slopes from dead level to vertical are acceptable. Both end and side laps should be 4". Wirebrush off fiberglass backing before welding. Vulcanize seam (2" minimum) with a hot air gun (automatic or handheld). The following job conditions must exist before applying the Allroof Polypren membrane.

A. The membrane shall not be applied when precipitation is imminent or during periods of precipitation.

B. The roof surface shall be free of ponded water, ice, snow, etc. to eliminate future condensation problems.

C. Cold temperatures will not restrict installation of the single-ply membrane.

D. 220 V, 4000-Watt electrical outlet shall be in place for the hot air welding gun for seaming purposes.

2. SARNAFIL, INC.
G 410

Only SARNAFIL G 410 membranes should be used in fully adhered applications. Reinforced with non-woven fiberglass mat, the 410 membrane has 100% dimensional stability, and a very low coefficient of thermal expansion, making total adhesion possible without shear stresses causing loss of adhesion. The 410 membrane is available in a variety of stable colors in addition to the standard gray. Adhesive is either a solvent-based adhesive (Sarnacol 2170) or a waterbased emulsion (Sarnacol 2121). Sarnacol 2121 is restricted to use during warm weather, and over water-absorbent substrates. Sarnacol 2170 must be used on vertical surfaces, and may be used on any approved substrate in any workable climatic condition. Compatibility of the membrane with the substrate must be assured; only approved insulations and substrates provide the code approvals required.

SARNAFIL, INC.
G 442

SARNAFIL G 442 membranes should be used in loosely laid and ballasted systems. Coverage rate of ballast is a minimum ten pounds per square foot; weight-bearing capacity of deck should be verified by a professional engineer prior to system design. The ballasted membrane is not the system of choice on high rise structures or in areas of high wind.

SARNAFIL, INC.
S 327

SARNAFIL S 327 membranes should be used for mechanically fastened applications. Reinforced with woven polyester fabric, the 327 membrane is specifically designed to provide the necessary characteristics of elongation and tensile strength to control the stressing of the membrane which occurs as result of dynamic loading, and thus is ideally suited to use in areas of high wind. The fastening pattern must be determined for each individual job, and is calculated based on building geometry, gound roughness, and wind zone. The fastening element is a 14-gauge perforated u-shaped galvanized steel profile and corrosion-resistant screws. Bar and screw assembly is covered by a hot air welded strip of SARNAFIL.

3. TROPICAL INDUSTIAL COATINGS, INC.
TROPISEAL MODIFIED BITUMEN ROOFING SHEET

TROPISEAL DESCRIPTION AND USE: The Tropiseal membrane is manufactured with a tough core of non-woven, spunbond and needle punched polyester fabric, which is impregnated on both sides with APP modified bitumen.

Each roll measure 107 square feet and weighs 88 lbs. Tropiseal is 4 mm thick with convenient "burn off" sheet and lined for easy and accurate installation.

Tropiseal is designed primarily to provide complete waterproofing protection for both flat and sloped roofs. Ideal for new roof construction and retrofit, as well as, roof and flashing repair. Tropiseal is also excellent for use on vertical walls and underground, protected applications.

APPLICATION PRECAUTIONS: Tropiseal should never be applied over existing roof systems which are loose or improperly anchored. Tropiseal should not be applied over wet insulation or other moisture trapped in the existing roof system.

Metal, masonry and concrete surfaces must be primed with a light asphalt primer (Tropilastic) and allowed to cure prior to installation of Tropiseal membrane flashing.

In extremely cold weather, Tropiseal and other roof componenets should be stored in protected areas until the time of installation.

WARRANTY INFORMATION: Warranties are available only where a complete roof survey is on file, in advance of the actual quotation...and then, only when the roof is accepted by Home Offices of Tropical Industrial Coatings, Inc., Brunswick, Ohio, as a proper substrate to accept successful application of Tropiseal. Standard roof survey forms are available from Tropical. Representative core sample of roof must be sent to Tropical, as confirmation that substrate does not contain excessive moisture, wet or rotting insulation or other "infectious" conditions that can later lead to failure of Tropiseal. All Tropical invoices for material must be paid within terms of sale. When all above conditions are met, Tropiseal warranties are available as follows: a) Limited 5 year warranty, or b) Limited 10 year warranty--10 year warranty issued only when Tropiseal is coated with Tropical Four Seasons Aluminum.

RATINGS: Factory Mutual, Class 1, I-90 Wind Uplift Rating Underwriters Laboratories, Inc., Class A

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BUILT-UP BITUMINOUS MEMBRANES:

A built-up bituminous membrane is the continuous semi-flexible component of a roof system whose primary function is the exclusion of water. The membrane consists of two or more alternate plies of felts, fabrics or mats which are often saturated and sometimes coated with bituminous materials, assembled in place and adhered to each other with alternate layers of bituminous products. Surfacing and parts of the substrate are not considered components of the membrane.

SINGLE PLY ROOFING MEMBRANE MATERIALS

The following information is reproduced from ***Single Ply Roofing: A Professional's Guide to Specifications*** with approval of the Single Ply Roofing Institute.

The synthetic materials which are used today as single ply roofing membranes have a long history of use in other types of products; for example, synthetic rubber sheeting has been used to make tarpaulins and tires, and vinyl products have been used for window framing and exterior siding. The specific formulations of these materials are determined by the way they will be used. MATERIALS WHICH ARE TO BE USED AS SHEET-APPLIED ROOFING MEMBRANES MUST BE FORMULATED TO EXHIBIT CERTAIN CHARACTERISTICS WHICH MAKE THEM SUITABLE FOR THAT PURPOSE.

The function of a roof membrane . . . is to provide a watertight covering for a building. It must be durable, strong, and resistant to climate and weathering. It must be able to accommodate anticipated structural movement without splitting or cracking. And, it must retain all of these properties over a reasonable period of time.

In order to formulate materials which meet all of these requirements, the proper mix of ingredients must be used. The materials' properties must be consistent from batch to batch. MANUFACTURERS ADHERE TO STRICT QUALITY CONTROL PROGRAMS TO ENSURE THAT MINIMUM PHYSICAL PROPERTIES ARE ACHIEVED AND MAINTAINED.

PRODUCTS BEING USED TODAY FOR SINGLE PLY ROOFING MEMBRANES

The list is long and growing, and the chemistry is complex. From a purely chemical point of view, all of the assorted materials can be labelled "polymeric," meaning "macromolecular material formed by the chemical combination of monomers having either the same or different chemical composition." ("Terminology Pertaining to Elastomeric and Plastomeric Material." The Roofing Industry Educational Institute, 1981.)

THE FOUR GROUPS OF SINGLE PLY PRODUCTS

defined by their chemical nature are:

1. *Vulcanized Elastomers* — also referred to as "thermosets." Both terms relate to the chemical cross-linkage of the polymers, which occurs during the manufacturing process. Once the linkages have been formed, a process also termed "curing," they cannot be changed. A distinguishing characteristic of a vulcanized elastomer is that it can only be bonded to itself (for example, to seam overlapping sheets) by the use of an adhesive because, once cured, new molecular linkages cannot be formed.

2. *Non-Vulcanized Elastomers* — also referred to as "uncured elastomers" — are not physically cured during manufacture. However, they may cure or vulcanize naturally over some period of time, upon exposure to the elements. Once they have cured, their behavior is similar to that of the vulcanized elastomers, and they have become thermosets.

3. *Thermoplastic* materials — distinguished from thermosets in that there is no cross-linking or vulcanization — can be welded together with heat or solvent and develop in these welds bond strengths which equal or surpass the strength of the base material.

4. *Modified Bitumen* roofing membranes — composite sheets consisting of bitumen, modifiers, and reinforcement. The term "modified bitumen" encompasses a broad range of materials, and each specific material differs from the others with respect to the modifiers and reinforcements used. They exhibit the thermoplastic quality of being softened by heat, but are separated into their own generic category because of the significant differences in their chemical makeup from the other thermoplastic materials.

GENERIC PRODUCT TYPES

Recognizing that no two products are identical even if they consist of the same predominant polymeric composition, the following descriptions provide some general information about each generic product type.

VULCANIZED ELASTOMERS

1. EPDM

   EPDM is an elastomeric compound synthesized from ethylene, propylene, and a small amount of diene monomer. It is generally used for roofing as a vulcanized material, although it is also possible to formulate EPDM membranes which are non-vulcanized. Used as a roofing material in the United States since the early 1960's, EPDM sheets range in thickness from 30-60 mils and are usually black or white in color. EPDM membranes exhibit a high degree of ozone, ultraviolet, weathering, and abrasion resistance, and good low temperature flexibility. EPDM's properties of resilience, tensile strength, elongation, and hardness are largely retained in aging tests at elevated temperatures. Resistance is excellent to acids, alkalis, animal and vegetable oils, and oxygenated solvents such as ketones, esters and alcohols. On the other hand, exposure to aromatic, halogenated, and aliphatic solvents should be avoided to prevent swelling and distortion of the membrane.

2. NEOPRENE

   Neoprene, or chloroprene rubber, is the first commercially available synthetic rubber product. Neoprene is formulated from polymers of chloroprene that were initially developed by E.I. DuPont deNemours and Company, which has been manufacturing neoprene products since 1931. Neoprene may be used in a variety of elastomeric applications. It can be molded or extruded into hose, belts, heels, soles, tires, gaskets, coated fabrics, or wire and cable insulation. Neoprenes are also used to make quick-setting and high strength adhesives. Neoprenes may be calendered into sheets that vary in thickness from 30-120 mils, and it is in this form that neoprene is used for roofing membranes. Chloroprene synthetic rubber sheets have been used as a single ply roofing membrane since 1957. Sheets are available plain or with a reinforcing fabric. Neoprene roof membranes have excellent resistance to weather, heat, oils, solvents, and abrasion. The characteristics of neoprene adhesives allow fabrication of field splices that achieve high seam strength to provide a reliable continuous weatherproofing membrane. Some formulations are available that will receive a coating of liquid HYPALON® synthetic rubber when a stable uniform color is desired for the roof membrane. These special non-staining neoprene products require such a coating for weather protection.

NON-VULCANIZED ELASTOMERS

1. CSPE

   Chlorosulfonated polyethylene, a synthetic rubber manufactured by DuPont, was introduced in 1951 under the trade name HYPALON® *. It is a self-curing non-vulcanized elastomer and is available as a liquid coating or in sheet form for single ply membrane application. CSPE sheet roofing membranes have been in use since 1966. They may be reinforced with polyester scrim or laminated to felt backing materials, and have a finished thickness of 30-60 mils. CSPE is a non-vulcanized product which exhibits thermoplastic qualities during processing and field installation. During roof exposure, curing or cross-linking occurs. CSPE exhibits strong resistance to weathering and a broad range of chemicals and pollutants, as well as being inherently ozone resistant. It may be produced in many colors and offers design versatility because of its adaptability to a variety of roof shapes and substrates.

2. CPE

   Chlorinated polyethylene was first introduced to the single ply membrane roofing market in 1964. The raw materials used are manufactured by the Dow Chemical Co. CPE may be formulated for use as roofing membranes as both cured and uncured elastomers. They may be non-reinforced or reinforced with scrim and range in thickness from 40-48 mils. They are inherently flexible and do not require the addition of plasticizers in their formulations. CPE exhibits strong resistance to oils and chemicals, excellent weatherability, and ozone resistance. They are also resistant to bitumen and can therefore be installed directly over existing asphalt or coal tar pitch roofs. Although usually produced in white or light gray for reflectivity and energy efficiency, CPE can also be pigmented to a variety of colors.

* Hypalon® is a registered trade mark of E.I. DuPont de Nemours & Co.

3. PIB

PIB (polyisobutylene) is an elastomeric compound, made of isobutylene and other polymers, which was first used as a roofing membrane in Europe in the 1960's. It has been available domestically in the form used today since the mid-1970's. The 60-mil PIB membrane is laminated to a 40-mil non-woven synthetic fleece backing, with an unbacked prefabricated sealing edge for the side laps. PIB exhibits good resistance to weathering, ultraviolet light, and radiant heat. It is compatible with asphalt, but is not resistant to petroleum distillates, organic oil and fats, or substances containing tar.

4. NBP

NBP Nitrile Alloy membranes are compounded from butadiene-acrylonitrile copolymers with other proprietary ingredients. They are typically reinforced with polyester and range in thickness from 30-45 mils. First developed in the mid-1960's, nitrile alloys have been used in engineering applications in the aircraft, automotive, and geomembrane industries. Used extensively for weather- and water-proofing applications since the mid-1960's, NBP reinforced single ply membranes exhibit excellent tear and puncture resistance, good weatherability, remain flexible at low temperatures, and have a low water vapor permeability. They are resistant to most chemicals but are sensitive to aromatic hydrocarbons.

THERMOPLASTICS

1. PVC

PVC (polyvinyl chloride) polymers, originally produced in Germany almost 30 years ago, are among the most versatile of thermoplastics for industrial and commercial applications. They are produced by the polymerization of vinyl chloride monomer, a gaseous substance resulting from the reaction of ethylene with oxygen and hydrochloric acid. In its most basic form, the resin is a relatively hard material which requires the addition of other compounds, commonly plasticizers and stabilizers as well as certain other ingredients, to produce the desired physical properties for end use. PVC membranes may be produced by calendering, extruding, or spread-coating, and they may be non-reinforced or reinforced with glass fibers or polyester fabric. They are usually 40-48 mils thick. PVC membranes are available which have provided up to 20 years of service life as exposed roofing. They are resistant to bacterial growth, industrial chemical atmospheres, root penetration, and extreme weather conditions. PVC membranes properly formulated have shown excellent fire resistance and seaming capabilities. PVC membranes are chemically incompatible with bituminous materials.

2. EIP

EIP are thermoplastic compounds consisting of ethylene interpolymers, stabilizers, pigments, anti-oxidants, and modifying polymers. EIP membranes are generally reinforced with polyester fabric and are usually 32 mils thick. They possess good resistance to fire, chemicals and oils and have high tear strength. Many formulations utilizing combinations of ethylene polymers with other basic ingredients can be produced.

MODIFIED BITUMENS

Polymer modified bituminous membranes were developed in Europe in the mid 1960's and have been in use in the United States since 1975. Both the bitumen and polymers used in these systems have been carefully selected and combined to result in an engineered coating which is coupled with various reinforcements to form a membrane specifically designed to meet the requirements for successful performance in a roofing system. The modifying compounds, such as styrene butadiene or atactic polypropylene, impart flexibility and elasticity, and improve cohesive strength, resistance to flow at high temperatures, and toughness. Reinforcing materials consist variously of plastic film, polyester mat, glass fibers, felt, or fabric; they may be embedded within or laminated to the surface of the modified bitumen membrane. The membrane may be surfaced with liquid coatings, metallic laminates, ceramic granules, or mineral aggregates to enhance UV and fire resistance. Modified bitumen membranes range in thickness from 40 to 160 mils.

PHYSICAL PROPERTIES

Although it is difficult to directly correlate physical property data with actual performance or life expectancy, manufacturers typically utilize such data in their quality control programs to ensure the suitability of the compound for its end use.

The following is a list of twelve basic material properties which SPRI's Technical Committee has identified as being pertinent to all roofing membranes, regardless of chemical composition.

1. Thickness
2. Tensile strength
3. Ultimate elongation
4. Modulus

5. Tear resistance
6. Water vapor transmission rate
7. Water absorption
8. Dimensional stability
9. Factory seam strength
10. Low temperature resistance
11. Results after heat aging
12. Results after accelerated weathering

Test Procedures for Evaluation of Materials

The test methods used to evaluate each of these properties vary depending upon the chemical composition and construction of the finished membrane. DIFFERENT TEST METHODS ARE USED FOR DIFFERENT GENERIC TYPES OF MATERIAL, AS WELL AS FOR REINFORCED AND NON-REINFORCED MEMBRANES.

To understand the results reported by manufacturers, it is important to know the test methods from which the data are derived. Frequently, attempts are made to compare the test results of different products to try to draw conclusions about their relative performance capabilities. Often the conclusions drawn are invalid because the comparison is of data obtained using different test methods. Sometimes a particular test method is preferred for a particular generic membrane type. In other cases, there are multiple tests that are equally applicable; the selection of which to use is made by individual manufacturers based on such factors as availability of necessary testing equipment or apparatus. Some testing may be performed by independent laboratories, while other tests are routinely performed by the manufacturer in-house.

In most cases, standard test methods are available. These are established by the American Society for Testing and Materials (ASTM). There are also other agencies worldwide which define testing methods for single ply membranes which may be similar to, but not exactly the same as, the ASTM methods. Some of these agencies utilize ad hoc procedures which may be difficult to duplicate or which do not differentiate between generic membrane types. IF PHYSICAL PROPERTY DATA ARE TO BE USED TO AID IN PRODUCT SELECTION, THE TEST METHODS SHOULD ALSO BE CONSIDERED. SOMETIMES THE DIFFERENCE IN TEST METHOD ACCOUNTS FOR THE DIFFERENCE IN THE PARTICULAR RESULTS REPORTED.

TEST METHODS

Much work is currently being done by ASTM in the area of standards for single ply roofing membranes, and it is expected that standard test methods and minimum material property valves will be developed for the vulcanized elastomers EPDM and Neoprene, and the thermoplastic PVC. Another ASTM group is addressing the testing of modified bitumen membranes. Historically, however, these products have not had standard ASTM procedures which were designed specifically for them as opposed to built-up bituminous roofing membranes. Therefore, the test procedures for these materials are in the development stage. The Modified Bitumen Sub-Committee of SPRI's Technical Committee has developed new and/or adapted existing ASTM methods which they feel best evaluate the physical characteristics of their products.

Table III lists the membrane properties discussed and the test methods which are preferred for each generic membrane type. A short description of the test methods can be found in Appendix A, entitled "Index and Abstract of ASTM Test Methods for Elastomeric and Plastic Materials." This document was reprinted with the permission of The Roofing Industry Educational Institute (RIEI), whom we would like to thank for their cooperation in making this available to us. Appendix B contains a list of recommended modifications to existing ASTM test procedures and the newly developed methods as provided by SPRI's Modified Bitumen Sub-Committee. The applicable ASTM documents for which SPRI has recommended modifications are referenced, and should be consulted by the user of this guide for the complete texts.

SIGNIFICANCE OF THE REPORTED PHYSICAL PROPERTIES OF MEMBRANE MATERIALS

1. THICKNESS — The distance between opposite surfaces of a material. Units of measure are mils, fractions of an inch, or millimeters.

   The relationship of thickness to actual performance is not entirely clear, and membranes are available in thicknesses ranging from 30 mils to as many as 160 mils. This rather significant variance may be accounted for by such factors as the polymer type and formulation, method of manufacture, physical construction of the finished sheet (e.g., surfacing, reinforcements, etc.), as well as the intended method of application. Thickness is related to quality control procedures in that the manufacturer must verify that a uniform thickness is maintained. The performance-related factors usually associated with membrane thickness are its resistance to mechanical damage, hail, traffic, and surface wear; although there are certainly other factors, such as compressibility of the substrate, which also contribute to all of these. In other words, the susceptibility of a membrane to damage does not in any way rely solely on the thickness of the material.

2. TENSILE STRENGTH — The maximum force or stress required to break a membrane sample. For non-reinforced membranes, strength is reported as a stress (pounds per square inch, or "psi"); for reinforced membranes, strength is reported as a force (pounds, or "lbf").

   This physical property relates to the ability of a membrane to withstand stresses which might be imposed by such things as building movement, wind uplift, and thermal loading. The presence of reinforcing material and the type of material used as reinforcement may also affect tensile strength.

3. ULTIMATE ELONGATION — The amount a membrane sample stretches during tensile testing before it ruptures, usually expressed as a percentage of the original length.

   The elongation of a membrane may contribute to its ability to accommodate movement in the substrate or structure without rupturing. There is a broad range of elongation values exhibited by products which are appropriate for use as single ply roofing membranes. The variance from product to product depends on chemical composition and sometimes on the presence of reinforcing materials. In some cases, a reinforcing material may break internally at a low strain level without affecting the integrity of the sheet, thereby allowing the membrane itself to stretch and achieve its elongation property. In other cases, the reinforcement has a high resistance to elongation and imparts this characteristic to the finished sheet, producing a membrane with a low elongation property. The selection is made by the manufacturer and is based largely on the manner in which the material will be installed.

4. MODULUS — Modulus is a measure of the stiffness of a polymeric sheet.

   Since polymeric materials do not exhibit traditional elastic behavior over their entire range of elongation, the modulus is not a constant; rather it is reported as the tensile stress required to produce a prescribed elongation. When the modulus at 50% elongation is reported for a number of products, it allows for a comparison of their relative stiffness. This is expressed as psi at a given percent elongation.

   The presence of reinforcement affects the modulus of a material by significantly increasing its stiffness; it may also affect the elongation properties in the direction of the reinforcing medium. Like elongation, this property is an indicator of the suitability of the formulation for use as a roofing membrane, but is not a direct predictor of its performance once installed. However, modulus, in combination with other factors, such as coefficient of thermal expansion and dimensional stability, may have an effect on the manner of attachment of the membrane at terminations.

5. TEAR RESISTANCE — The load required to tear a material when the stress is concentrated on a small area of the specimen by the introduction of a prescribed flaw, expressed in psi or pounds-force.

   This property indicates a membrane's ability to resist initiation and/or propagation of a tear. Recognizing that occasionally mechanical damage occurs which results in a tear or puncture, it is important that during installation — or membrane expansion and contraction due to structural or substrate movement or wind uplift pressures — the membrane be able to resist further tearing. Resistance to tear is also of importance in mechanically attached membrane systems in which the membrane is penetrated by fasteners, and wherever penetration of the membrane occurs at terminations. Different test methods are used to test the tear resistance of reinforced and non-reinforced membranes.

6. WATER VAPOR TRANSMISSION — A measure of the rate of transmission of water vapor through the membrane material under controlled laboratory conditions of temperature and humidity, expressed as grains/hour/square foot/ or grams/24 hours/square meter.

   This property, which is measured under prescribed testing procedures, determines the rate at which vapor passes through the membrane. The actual vapor transmission rate of a specific membrane is important in the design of the total roofing assembly with regard to the inclusion or exclusion of a vapor retarder.

7. WATER ABSORPTION — The amount of water absorbed by a material after immersion for a prescribed period of time, expressed as a percentage of the original weight of the material.

   The membrane must be resistant to water absorption from continuous submersion in water due to ponding, whether because of poor drainage or snow and ice build-up. A significant loss or gain of weight during immersion would indicate that the membrane may not perform satisfactorily over a long period of time. This water absorption may affect dimensional stability and membrane thickness, and may cause internal stress which could lead to cracking.

8. DIMENSIONAL STABILITY — The change in length and/or width of a material that results from exposure to elevated temperatures over time, expressed as a percent.

Dimensional change which occurs after installation of the membrane may affect its watertight integrity and build up forces within the roof system. Such changes in sheet dimension can occur for a number of reasons: a) stress induced on the membrane during some manufacturing processes; b) stress introduced during the windup operation phase of some post-manufacturing processes; and c) the extraction of certain components of the compound due to contact with incompatible materials or through volatility of the compound.

The effect of all of the above conditions can often be accelerated by testing at elevated temperatures.

9. FACTORY SEAM STRENGTH — The force required to cause failure (in peel or shear) of a seam which has been created by the material supplier, expressed in psi or as a percentage of the strength of the sheet itself.

   Not all manufacturers supply membranes containing factory seams. However, this property is considered to be as significant to the overall performance as are field seams. The most disruptive forces to which a membrane will be subjected occur during installation. The factory seam must resist unfolding, stretching, pulling, and fluttering by the installers during placement and final positioning of the sheet.

10. LOW TEMPERATURE RESISTANCE — The lowest temperature at which the material does not fracture or crack under prescribed impact and flexing conditions, expressed in °F or °C.

    It is important for the membrane to be able to accommodate, without cracking, the combination of low temperatures and mechanical impact during application, structural movement, or rooftop traffic which occur in cold climates. However, there may not be a strong correlation between low temperature flexibility as tested in the laboratory and the actual temperature service range of the membrane on the roof.

11. HEAT AGING — This test procedure is an attempt to accelerate the effect that solar heating will have on the properties of the installed roof membrane. The change(s) in physical properties (such as tensile properties) that result from exposure are then compared to those of the original unexposed material.

    The results may provide some insight into, but no direct correlation with, the actual changes in physical properties which may occur during natural aging. It is particularly difficult to relate the exposure time during testing to real time during the life of the exposed membrane.

12. ACCELERATED WEATHERING — The process in which materials are exposed to a controlled environment where various phenomena, such as heat, water, condensation, and light, are altered to magnify their effects, thereby accelerating the weathering process. The physical properties that result from this exposure are then measured and compared to those of the original unexposed material.

    These tests are an attempt to provide insight into the long term performance of the membrane under exposure to the climatic variables of sunlight and precipitation. Again, there is no clear correlation between the test results and actual performance, and the relationship between test exposure time and real time is difficult to determine.

INDEX: Roof Board Insulation

	Expanded Polystyrene	Extruded Polystyrene	Glass Fiber	Cellular Glass	Phenolic	Fiberboard	Perlite	Polyurethane	Polyiso-cyanurate	Composite
1. ADAMS, R.L. PLASTICS, INC 2450 BUCHANAN S.W. GRAND RAPIDS, MI 49508 616/241-3605		82								
2. AMERICAN WESTERN MFG. P.O. BOX 1422 MESA, AR 85201 602/969-5966									88	92
3. APACHE BLDG PRODUCTS CO. 2025 EAST LINDEN AVE. LINDEN, NJ 07036 201/486-6723									88	
4. ARCO CHEMICAL CO. 1500 MARKET STREET BOX 7258 PHILADELPHIA, PA 19101										92
5. ASSOCIATED FOAM MFRS. P.O. BOX 246 EXCELSIOR,MN 55331 800/255-0176	80	82								
6. AVILITE IND. DIV CONPROCO P.O. BOX 311 MARLBOROUGH, NH 03455 603/876-3313	80									
7. B-TECH INC. 1601 CLAY STREET DETROIT, MI 48212 313/872-2577	80									
8. BIG SKY INSUL. UNLIMITED 15 ARDEN DRIVE P.O. BOX 838 BELGRADE, MT 59714 406/388-4146	80									
9. CARLISLE SYNTEC SYSTEMS P.O. BOX 7000 CARLISLE, PA 17013 717/233-0452	81									92
10. CELOTEX CORPORATION, THE 1500 NORTH DALE MABRY HWY. TAMPA, FL 33607 813/871-4811						85	86		88	92
11. CORNELL CORP. P.O. BOX 338 CORNELL, WI 54732 715/239-6411										92
12. DOW CHEMICAL CO. GRANVILLE RESEARCH CENTER FOAM PROD. TS&D BOX 515 GRANVILLE, OH 43023 614/587-4250		82								92
13. DREW FOAM OF COLORADO 1450 W. COLFAX DENVER, CO 80204 303/534-3904	80									
14. DYRELITE CORP. INC. 63 DAVID STREET P.O. BOX B-947 NEW BEDFORD, MA 02741 617/993-9955	80									
15. EPS MOLDING INC. 2019 BROOKS HOUSTON, TX 77026 713/224-3486	81	82								92
16. ENERGY IND. INC. 3100 9TH AVE. S.E. WATERTOWN, SD 57201 605/882-2222	81									93
17. FALCON MFG. OF CALIFORNIA 14110 TOWNE AVENUE P.O. BOX 61216 LOS ANGELES, CA 90061 213/515-7102	80									93
18. FOAM FORMS INC. 10 FOAM FORM PLACE WAUKEGAN, IL 60085 312/336-2850	80									
19. FOAM PLASTIC OF NEW ENGLAND ROUTE 69 PROSPECT, CT 06712 203/758-6411	80									
20. FOAM TECH INC. 10801 MILLINGTON COURT CINCINNATI, OH 45240 513/791-6750	81									
21. GAF CORPORATION 1361 ALPS ROAD WAYNE, NJ 07470 201/628-3000							86	87	88	93
22. GILMAN BROS CO. GILMAN, CT 06336 203/889-8444	80									
23. HOMASOTE COMPANY BOX 7240 WEST TRENTON, NJ 08628 609/883-3300									89	93
24. HUBERT FIBERBOARD INC. E. MORGAN STREET BOX 167 BOONVILLE, MO 65233 816/882-2704						85				
25. INDUSTRIAL FOAM PRODUCTS BOX 352 PERRYVILLE, MO 63775 314/547-6448	80									
26. INSUL. BLDG. SYSTEMS INC. 1516 SPRING HILL ROAD MCLEAN, VA 22102 703/893-7825	81									
27. INSUL. CORP OF AMERICA 2571 MITCHELL AVENUE ALLENTWON, PA 18103 215/791-4200	81									94
28. INT'L PERMALITE INC 300 NORTH HAVEN AVENUE ONTARIO, CA 91761 714/983-9591							86		89	94
29. KOPPERS COMPANY 1301 KOPPERS BUILDING PITTSBURGH, PA 15219 412/227-2229					85					
30. LOW-TEMP ENG. INC 308 EAST MAIN STREET NORTON, MA 02766 617/285-7737	80									
31. LUCAS SALES CO. INC 10623 BAUR BLVD ST. LOUIS, MO 63132 314/993-9610		83					86			
32. MANVILLE BLDG MAT'LS CORP P.O. BOX 5108 DENVER, CO 80217 303/978-2000							86	87	89	94
33. MARKO FOAM PRODUCTS INC. 2500 W. 1100 SOUTH SALT LAKE CITY, UT 84104 801/972-1354	81									
34. MINNESOTA DIVERSIFIED PROD. 1901 13TH STREET N.E. NEW BIGHTON, MN 55112 612/633-6770	80	83								
35. NPS CORPORATION P.O. BOX 31 PERRYILLE, MO 63775 314/547-8389	80									
36. NRG BARRIERS INC. 61 EMERY STREET SANFORD, ME 04073 207/324-7745								87	89	95
37. NORTHWEST EPS INC. P.O. BOX 970 1215 WEST FIRST THE DALLES, OR 97058	81									95
38. OWENS-CORNING FIBERGLAS FIBERGLAS TOWER TOLEDO, OH 43659 419/248-8000			84			85			89	
39. PERMA "R" PRODUCTS INC. P.O. BOX 5235 EKS JOHNSON CITY, TN 37601 615/929-8191	81									95
40. PITTSBURGH CORNING CORP. 800 PRESQUE ISLE DRIVE PITTSBURGH, PA 15239 412/327-6100					84					
41. POLY FAB INDUSTRIES INC. 9540 83RD AVENUE NORTH MAPLE GROVE, MN 55369 612/425-8855	80								89	95
42. POLY FOAM INC. 116 PINE STREET LESTER PRAIRIE, MN 55354 612/395-2551	80									
43. RADVA CORP. BOX 2900 F.S.S. RADFORD, VA 24143 703/639-2458	81									
44. R-MAX INC. 14651 DALLAS PARKWAY SUITE 319 DALLAS, TX 75240 214/387-4500									89	96
45. REACH PLASTICS & CHEMICAL INC. 4294 ALBANY STREET COLONIE, NY 12205 513/456-8636	81									
46. SEQUOYAH FOAM INC. 1110 WEST ARLINGTON ST. SALLISAW, OK 74955 918/775-6271	81									96
47. SOUTHERN OHIO FOAM 139 HARMON AVENUE P.O. BOX 304 LEBANON, OH 45036 513/932-6923	81									
48. SPECTRUM MFG P.O. BOX 185 BIG BEND, WI 53103 414/622-4412	81									

INDEX: Roof Board Insulation

	Expanded Polystyrene	Extruded Polystyrene	Glass Fiber	Cellular Glass	Phenolic	Fiberboard	Perlite	Polyurethane	Polyisocyanurate	Composite
49. TEMPLE-EASTEX INC. P.O. DRAWER N DIBOLL, TX 75941 800/231-6060									90	
50. THERMA FOAM INC. 2425 FRANKLIN AVENUE FORT WORTH, TX 76106 817/624-7204	81									96
51. THERMAL FOAMS INC. 2101 KENMORE AVENUE BUFFALO, NY 14207 716/874-6474	81									96
52. THERMAL SYSTEMS INC. 3055 W. 2100 STREET SALT LAKE CITY, UT 84119 801/972-6650									90	96
53. TEX-STYRENE PLASTICS INC. RT. 9 BOX 104 FT. WORTH, TX 76179 817/831-0533	81								90	
54. UC INDUSTRIES P.O. BOX 37 TALLMADGE, OH 44278 216/633-6735		83								
55. WIN-TEC INC. 10 FOAM FORM PLACE WAUKEGAN, IL 60085 312/336-1610									90	97
56. WOOLLEY & COMPANY 6865 MIMMS DRIVE DORAVILLE, GA 30340 404/483-4491	80									

Expanded Polystyrene (Homogeneous Only) Roof Board Insulation

Products listed in state alphabetic sequence.

1. Company / 2. State	Falcon Mfg Of Calif / CA	Drew Foam of Colorado / CO	Foam Plastics Of New England / CT	Gilman Bros. C Co. / CT	Woolley & Co / GA	Foam Forms Inc / IL	Dyrelite Corp Inc / MA	Low-Temp Eng. Foam Div. / MA	B-Tech Corp. / MI
3. Product Trade Name	Falcon BeadBoard	Drew Foam EPS	DuraFoam	Cellulite	Acraspan	EPS	Dyrelite	LowTemp Foam EPS	EPS Insulation
4. Density(ies) (per ASTM C-303) or (Other)									
4.1 1.00 lbs/ft³	X	X	X	X	X	X	X	X	X
4.2 1.25 lbs/ft³	X	X	X	X	X	X	X	X	X
4.3 1.50 lbs/ft³	X	X	X	X	X	X	X	X	X
4.4 2.00 lbs/ft³	X		X		X	X	X	X	X
5. Surface Treatment:									
5.1 Roofing Felt									
5.2 Foil Faced Kraft	X	X		X			X	X	X
5.3 Treated Kraft									
5.4 Kraft				X				X	X
5.5 Other									
6. Available as Tapered Material									
6.1 With Facer						NO	NO	YES	YES
6.2 Without Facer	YES	YES	YES	YES	YES	YES	YES	YES	YES
7. Year First Used in Commercial Roofing Systems	1976	1972		1955	1976	1954	1962	1978	
8. Estimated % of Thermal Value Retention @ 1 year	100	100	100	100		100	100	100	100
(Assuming a continuous mean temperature 5 years	90	95		96		100	100	100	100
differential & constant moisture content) 10 years	90	95		96		100	100	100	100
9. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)	ICBO 4059 ICBO 3401 ICBO 3504 ICBO 3530		P225 P231 P234 P703 ICBO 3504 BOCA 79-06					P701,P801,P802 P803,P814,P815 BOCA 1319 SBCCI 718 ICBO 3504	
10. Limitations and/or Restrictions									

1. Company / 2. State	Falcon Mfg / MI	Minnesota Diversified Products / MN	Poly Fab Ind. Inc. / MN	Poly Foam Inc / MN	Industrial Foam Prod / MO	NPS Corp / MO	Big Sky Unlimited / MT	Avilite Ind Div Conproco / NH	Associated Foam Mfrs / MN
3. Product Trade Name	Falcon Foam	Raylite	PF100, PF125 PF150, PF200	Dri-Lite	Insul-Drain	Energy Foam	SnoFoam EPS	EPS	Contour Taper Tile
4. Density(ies) (per ASTM C-303) or (Other)									
4.1 1.00 lbs/ft³	X	X	X	X	X	X	X	X	X
4.2 1.25 lbs/ft³	X	X	X	X	X	X	X	X	X
4.3 1.50 lbs/ft³	X	X	X	X	X	X	X	X	X
4.4 2.00 lbs/ft³	X	X	X	X	X	X	X		X
5. Surface Treatment:									
5.1 Roofing Felt	X	X		X	X				X
5.2 Foil Faced Kraft		X		X	X	X	X	X	X
5.3 Treated Kraft									
5.4 Kraft		X				X			
5.5 Other	X								X(See Mfr)
6. Available as Tapered Material									
6.1 With Facer	YES	YES	NO	YES	YES	NO	NO	NO	YES
6.2 Without Facer	YES	YES	YES	YES	YES	YES	YES	YES	YES
7. Year First Used in Commercial Roofing Systems	1979	1964	1979	1960	1982	1978	1977		1966
8. Estimated % of Thermal Value Retention @ 1 year	100	80	100	100	100	98	100	100	100
(Assuming a continuous mean temperature 5 years	95	80	100	97	95	95	100	100	100
differential & constant moisture content) 10 years	94	80	100	95	94	95	100	100	100
9. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)			P703 P513 ICBO 3401	ICBO 4169	ICBO 1717 BOCA 876.6 SBCCI 717 AIA 702.9		P803 P814 P815		ICBO 4169 P703
10. Limitations and/or Restrictions									See Appendix

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★ = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: NA = Not available; N/A = Not applicable.

Expanded Polystyrene (Homogeneous Only) Roof Board Insulation

Products listed in state alphabetic sequence.

Reach Plastics & Chemicals NY	Thermal Foams Inc. NY	Foam Tech Inc. OH	Southern Ohio Foam OH	Sequoyah Foam OK	Northwest EPS Inc. OR	Carlisle SynTec Systems PA	Insulation Corporation of America PA	Energy Ind Inc SD	Perma "R" Products Inc TN	EPS Molding Inc TX	EPS Molding Inc TX
Permavon	Thermal Foam EPS	FTI EPS	Delta Foam		Sno-Foam EPS	Sure-Seal EPS	Insolite Roof Ins	Permafoam	Perma R	Contour Taper Tile	EPSM Board
X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X		X	X	X	X	X
X	X	X	X	X	X		X	X	X		X
X	X	X	X		X		X	X			
		X	X		X			X	X		X
				X	X		X	X	X		X
											X
					X						
X(See Mfr)	X(See Mfr)		Mylar								
NO	NO	YES	YES	YES	NO		YES	YES	YES	NO	NO
NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	1976	1983	1970	1980	1977	1981	1979	1977	1977	1966	1977
80	80		100	95	100	80	100	100	99	100	100
80	80		95	95	100	80	100	100	97	100	100
80	80		95	95	100	80	100	100	95	100	100
	ICBO 4169			ICBO 3401	P251 P513 P801 P803 P814 P815 P902 P923	P701 P801	P701 P801 P803 P814 P815			ICBO 4169 P703	P703 ICBO 4619
						See Appendix			See Appendix		

EPS Molding Inc TX	EPS Molding Inc TX	Tex-Styrene Inc. TX	Therma Foam Inc. TX	Marko Foam Products Inc UT	Insulated Bldg Systems, Inc VA	Radva Corp VA	Spectrum Mfg WI				
Lt Deck Board	TC-Board	Span-Tex	EPS	Blue Dot EPS	Insultech EPS	ThermaStruct Roof Panel	EPS Board				
X	X	X	X	X	X	X	X				
X	X	X	X	X	X	X	X				
		X	X	X	X	X	X				
		X	X	X	X	X	X				
	X				X						
	X	X	X		X		X				
	X										
							X				
NO	NO	NO	NO		YES		YES				
NO	YES	YES	YES		YES	YES	YES				
		1982	1980	1974	1979		1976				
100	100		100		100						
100	100		100		100						
100	100	80	100		100						
P513	P703	P703 P810 P901 P905 P906 P910 P911 P913			P 513 P701 ICBO 3401	ICBO 3343 BOCA 81-47 SBCCI 8028					
See Appendix											

Extruded Polystyrene (Homogeneous Only) Roof Board Insulation

Products listed by alphabetic company name.

1. Company	Adams, R.L. Plastics, Inc	Associated Foam Mfgrs	Associated Foam Mfgrs	Dow Chemical, USA	Dow Chemical, USA	Dow Chemical, USA	Dow Chemical, USA	EPS Molding Inc	EPS Molding Inc
2. State	MI	MN	MN	OH	OH	OH	OH	TX	TX
3. Product Trade Name	USB Under-Siding Bd	Contour Taper Tile X	Contour Taper Tile X	Styrofoam Brand Insl	Styrofoam TG Brand Insl	Styrofoam PD Brand Insl	Styrofoam RM Brand Insl	Contour Pro-tected Board	Contour Taper Tile X
4. Density (per ASTM C-303) or (Other); lbs/ft³	2.0	1.8	1.4	1.9 Typ	1.9 Typ	2.4 Typ	2.2 Typ	2.4	1.4
5. Surface Treatment: Top Surface	Krft 2 Sides Foil 2 Sides Plastic	Continuous Skin 2 Sides Taper=1 Side	Continuous Skin 2 Sides Taper=1 Side	None-Natural Skin	None-Natural Skin	None-Natural Skin	None-Natural Skin	Continuous Skin	Continuous Skin 2 Sides Taper=1 Side
Bottom Surface	Kraft Foil Plastic	Continuous Skin, 2 Sides Taper=1 Side	Continuous Skin 2 Sides Taper=1 Side	None-Natural Skin	None-Natural Skin	None-Natural Skin	None-Natural Skin	Continuous Skin	Continuous Skin 2 Sides Taper=1 Side
6. Available as Tapered Material	NO	YES	YES	YES	NO	YES	YES	NO	YES
7. Year First Used in Commercial Roofing Systems		1980	1980	1976	1976	1976		1984	1980
8. Meets Applicable Standard Specifications		HHI524C-III ASTMC578-83-III	HHI524C-IV ASTMC578-83-IV	HHI524C ASTMC578	HHI524C ASTMC578	HHI524C ASTMC578	HHI524C ASTMC578	HHI524C-IV ASTMC578-83	HHI524C-II ASTMC578-83-II
9. Compressive Strength (per ASTM D-1621) or (Other); psi		15	25	40 Typ/25 Mn	40 Typ/25 Mn	70 Typ/60 Mn	45 Typ/25 Mn	40	15
10. Water Absorption (per ASTM C-272) or (Other); % by vol.		.20	.15	.1 Typ/.3 Mx	.1 Typ/.3 Mx	.1 Typ/.3 Mx	.1 Typ/.3 Mx	.06	.20
11. Flexural Strength (per ASTM C-203); psi		62 LG,42 TR	100 LG,62 TR	80 Typ/60 Mn	80 Typ/60 Mn	80 Typ/60 Mn	80 Typ/60 Mn	100	62 LG,42 TR
12. Common Available Sizes (Contact mfr. for other sizes and special orders)									
12.1 2′x4′							X		X
12.2 3′x4′									
12.3 4′x4′									
12.4 4′x8′			X	X	X				
12.5 Other		X (2′x 8′)	X (2′x 8′)	X (See Mfgr)	X (see Mfgr)	X (2′x 8′)	X (2′x 8′)	X (2′x 8′)	
13. Common Available Thicknesses (Contact mfr. for other thicknesses) (C) Values, (R) Values, Weight/ft²									
13.1 Thickness; in inches		1	1	.5	.8	1.5	1.0	1	1
Thermal Conductance (C) @ 40°F		.18	.18	.37	.247	.123	.185	.18	.18
@ 75°F		.20	.20	.40	.267	.133	.20	.20	.20
Thermal Resistance (R) @ 40°F		5.55*	5.55*	2.70*	4.04*	8.13*	5.40*	5.5*	5.55*
@ 75°F		5.0*	5.0*	2.50*	3.74*	7.51*	5.00*	5.0*	5.0*
Weight; lbs/ft²		.13	.15	.079	.119	.30	.183		
13.2 Thickness; in inches		1.5	1 1/2	1.0	1.0	2.0	1.5	1.5	1.5
Thermal Conductance (C) @ 40°F		.16	.16	.185	.185	.093	.123	.12	.12
@ 75°F		.173	.173	.20	.20	.10	.133	.13	.13
Thermal Resistance (R) @ 40°F		6.25*	6.25*	5.40*	5.40*	10.75*	8.13*	8.33*	8.33*
@ 75°F		5.78*	5.78*	5.00*	5.00*	10.00*	7.51*	7.69*	7.69*
Weight; lbs/ft²		.195	.225	.158	.158	.40	.275		
13.3 Thickness; in inches		2	2	1.5	1.5	2.5	2.0	2	2
Thermal Conductance (C) @ 40°F		.12	.12	.123	.123	.074	.093	.09	.09
@ 75°F		.129	.129	.133	.133	.080	.10	.10	.10
Thermal Resistance (R) @ 40°F		8.33*	8.33*	8.13*	8.13*	13.51*	10.75*	11.11*	11.11*
@ 75°F		7.75*	7.75*	7.51*	7.51*	12.50*	10.00*	10.00*	10.00*
Weight; lbs/ft²		.26	.30	.238	.238	.50	.367		
13.4 Thickness; in inches		2.5	2 1/2	2.0	2.0	3.0	2.5	3	2.5
Thermal Conductance (C) @ 40°F		.103	.103	.093	.093	.062	.074	.061	.068
@ 75°F		.096	.096	.10	.10	.067	.080	.066*	.08
Thermal Resistance (R) @ 40°F		9.71*	9.71*	10.75*	10.75*	16.12*	13.51*	16.39*	14.71*
@ 75°F		10.42*	10.42*	10.00*	10.00*	14.92*	12.50*	15.15*	12.50*
Weight; lbs/ft²		.325	.375	.317	.317	.60	.458		
13.5 Thickness; in inches		3	3	2.5	3.0	3.5	3.0		3
Thermal Conductance (C) @ 40°F		.086	.086	.074	.062	.053	.062		.061
@ 75°F		.08	.08	.080	.067	.057	.067		.066
Thermal Resistance (R) @ 40°F		11.63*	11.63*	13.51*	16.12*	18.86*	16.12*		16.39*
@ 75°F		12.50*	12.50*	12.50*	14.92*	17.54*	14.92		15.15*
Weight; lbs/ft²		.39	.45	.396	.356	.70	.550		
13.6 Thickness; in inches				4.0			4.0		
Thermal Conductance (C) @ 40°F				.04			.04		
@ 75°F				.05			.05		
Thermal Resistance (R) @ 40°F				25.00*			25.00*		
@ 75°F				20.00*			20.00*		
Weight; lbs/ft²				.63			.73		
14. Estimated % of Thermal Value Retention @ 1 year (Assuming a continuous mean temperature differential & constant moisture content) 5 years 10 years				100 100 97	100 100 97	100 100 97	100 100 97	100 100 100	100 100 100
15. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)				ICBO 2257 BOCA 80-72 SBCCI 8183	ICBO 2257 BOCA 80-72 SBCCI 8183	See Appendix	See Appendix	SBCCI 717 ICBO 1712 BOCA 1317	ICBO 3628 BOCA 82-36 SBCCI 8294
16. Limitations and/or Restrictions									

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* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

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Extruded Polystyrene (Homogeneous Only) Roof Board Insulation

Products listed by alphabetic company name.

1. Company	EPS Molding Inc	Lucas Sales Company, Inc	Lucas Sales Company, Inc	Minnesota Diversified Products	UC Industries	UC Industries	UC Industries		
2. State	TX	MO	MO	MN	OH	OH	OH		
3. Product Trade Name	Contour Taper Tile X	Lucas Lite Tapered	Lucas Lite Tapered	CERTIFOAM	Foamular 150	Foamular 250	Foamular 404		
4. Density (per ASTM C-303) or (Other); lbs/ft³	1.8	1.4	1.8	2.5	1.4 Typ	1.8 Typ	2.4 Typ		
5. Surface Treatment: Top Surface	Continuous Skin 2 Sides Taper=1 Side	Continuous Extruded Skin	Continuous Extruded Skin	Continuous Extruded Skin	Continuous Skin	Continuous Skin	Continuous Skin		
Bottom Surface	Continuous Skin 2 Sides Taper=1 Side	Saw Cut Surface	Saw Cut Surface	Continuous Extruded Skin	Continuous Skin	Continuous Skin	Continuous Skin		
6. Available as Tapered Material	YES	YES (Only)	YES (Only)	YES	YES	YES	NO		
7. Year First Used in Commercial Roofing Systems	1980	1983	1983	1983	1983	1983	1984		
8. Meets Applicable Standard Specifications	HHI524C-IV ASTMC578-83-IV	HHI524C-II ASTMC578-83-II	HHI524C-IV ASTMC578-83-IV	HHI524C-IV ASTMC578-83-IV	ASTMC578-83 HHI524C	ASTMC578-83 HHI524C	ASTMC578-83 HHI524C		
9. Compressive Strength (per ASTM D-1621) or (Other); psi	25	15	25	40	15 Min	25 Min	40 Min		
10. Water Absorption (per ASTM C-272) or (Other); % by vol.	.15	.20	.15	.17	.20	.15	.06		
11. Flexural Strength (per ASTM C-203); psi	100 LG,62 TR	62	100	117	62 LG,42 TR	100 LG,62 TR	120 LG,75 TR		
12. Common Available Sizes (Contact mfr. for other sizes and special orders)									
12.1 2′x4′				X			X		
12.2 3′x4′				X					
12.3 4′x4′				X					
12.4 4′x8′	X			X	X	X			
12.5 Other	X (2′x 8′)	X (2′x 8′)	X (2′x 8′)	X	X (2′x 8′)	X (2′x 8′)			
13. Common Available Thicknesses (Contact mfr. for other thicknesses) (C) Values, (R) Values, Weight/ft²									
13.1 Thickness; in inches	1	Offered as a Tapered System. Thickness and C&R Values are Dependent on	Offered as a Tapered System. Thickness and C&R Values are Dependent on	3/4	1	1	1		
Thermal Conductance (C) @ 40°F	.18				.18	.18	.18		
@ 75°F	.20			.22*	.20	.20	.20		
Thermal Resistance (R) @ 40°F	5.55*			4.5	5.4	5.4	5.4		
@ 75°F	5.0*				5.0	5.0	5.0		
Weight; lbs/ft²									
13.2 Thickness; in inches	1.5	Thermal and Drainage Design Requirements. K @ 40F=.18 K @ 75F=.20	Thermal and Drainage Design Requirements. K @ 40F=.18 K @ 75F=.20	1	1 1/2	1 1/2	1 1/2		
Thermal Conductance (C) @ 40°F	.12					.123*	.123*		
@ 75°F	.13			.17*	.133*	.133*	.133*		
Thermal Resistance (R) @ 40°F	8.33*					8.1	8.1		
@ 75°F	7.69*			6.0	7.5	7.5	7.5		
Weight; lbs/ft²									
13.3 Thickness; in inches	2	2	2	1 1/2	2	2	2		
Thermal Conductance (C) @ 40°F	.09					.092*	.092*		
@ 75°F	.10	.10*	.10*	.13*	.10*	.10*	.10*		
Thermal Resistance (R) @ 40°F	11.11*					10.8	10.8		
@ 75°F	10.00*	10.0	10.0	7.5	10.0	10.0	10.0		
Weight; lbs/ft²									
13.4 Thickness; in inches	2.5	2 1/2	2 1/2	2	2 1/2	2 1/2	2 1/2		
Thermal Conductance (C) @ 40°F	.068					.074*	.074*		
@ 75°F	.08	.08*	.08*	.10*	.08*	.08*	.08*		
Thermal Resistance (R) @ 40°F	14.71*					13.5	13.5		
@ 75°F	12.50*	12.5	12.5	10.0	12.5	12.5	12.5		
Weight; lbs/ft²									
13.5 Thickness; in inches	3	3	3		3	3	3		
Thermal Conductance (C) @ 40°F	.061					.061*	.061*		
@ 75°F	.066	.066*	.066*		.066*	.066*	.066*		
Thermal Resistance (R) @ 40°F	16.39*					16.2	16.2		
@ 75°F	15.15*	15.0	15.0		15.0	15.0	15.0		
Weight; lbs/ft²									
13.6 Thickness; in inches									
Thermal Conductance (C) @ 40°F									
@ 75°F									
Thermal Resistance (R) @ 40°F									
@ 75°F									
Weight; lbs/ft²									
14. Estimated % of Thermal Value Retention @ 1 year	100	99	99	>80	99	99	99		
(Assuming a continuous mean temperature differential & constant moisture content) 5 years	100	95	95	>80	95	95	95		
10 years	100	80	80	>80	80	80	80		
15. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)	ICBO 3628 BOCA 82-36 SBCCI 8294								
16. Limitations and/or Restrictions									

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* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: NA = Not available; N/A = Not applicable.

Glass Fiber/Mineral Fiber (Homogeneous Only) Roof Board Insulation

Products listed by alphabetic company name.

1. Company	Owens-Corning Fiberglas	
2. State	OH	
3. Product Trade Name	Fiberglas	
4. Surface Treatment: Top Surface	Asphalt and Kraft Cap Sheet	
Bottom Surface	None	
5. Available as Tapered Material	YES	
6. Year First Used in Commercial Roofing Systems	1941	
7. Meets Applicable Standard Specifications	HHI526 ASTMC726	
8. Compressive Strength (per ASTM C-165) or (Other); psi	Above 12	
9. Water Absorption (per ASTM C-209) or (Other); % by vol.	Below 10	
10. Flexural Strength (per ASTM C-203) or (Other); psi	N/A	
11. Common Available Sizes (Contact mfr. for other sizes and special orders)		
11.1 2'x4'		
11.2 3'x4'	X	
11.3 4'x4'		
11.4 4'x8'	X	
11.5 Other		
12. Common Available Thicknesses (Contact mfr. for other thicknesses), (C) Values, (R) Values, Weight/ft²		
12.1 Thickness; in inches	3/4	
Thermal Conductance (C) @ 40°F		
@ 75°F	.36	
Thermal Resistance (R) @ 40°F		
@ 75°F	2.78	
Weight; lbs/ft²	.98	
12.2 Thickness; in inches	15/16	
Thermal Conductance (C) @ 40°F		
@ 75°F	.27	
Thermal Resistance (R) @ 40°F		
@ 75°F	3.70	
Weight; lbs/ft²	1.03	
12.3 Thickness; in inches	1 1/16	
Thermal Conductance (C) @ 40°F		
@ 75°F	.24	
Thermal Resistance (R) @ 40°F		
@ 75°F	4.17	
Weight; lbs/ft²	1.06	
12.4 Thickness; in inches	1 15/16	
Thermal Conductance (C) @ 40°F		
@ 75°F	.19	
Thermal Resistance (R) @ 40°F		
@ 75°F	5.26	
Weight; lbs/ft²	1.30	
12.5 Thickness; in inches	2 1/16	
Thermal Conductance (C) @ 40°F		
@ 75°F	.12	
Thermal Resistance (R) @ 40°F		
@ 75°F	8.33	
Weight; lbs/ft²	1.70	
12.6 Thickness; in inches	2 7/16	
Thermal Conductance (C) @ 40°F		
@ 75°F	.10	
Thermal Resistance (R) @ 40°F		
@ 75°F	10.00	
Weight; lbs/ft²	1.95	
13. Estimated % of Thermal Value Retention @ 1 year (Assuming a continuous mean temperature differential & constant moisture content) **5 years**	3	
10 years	.08	
14. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)	12.50 2.31	
15. Limitations and/or Restrictions		

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* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: NA = Not available; N/A = Not applicable.

Cellular Glass (Homogeneous Only) Roof Board Insulation

Products listed by alphabetic company name.

1. Company	Pittsburgh Corning Corp	
2. State	PA	
3. Product Trade Name	Foamglas	
4. Surface Treatment: Top Surface	8.5 Kraft	
Bottom Surface	Kraft	
5. Available as Tapered Material		
6. Year First Used in Commercial Roofing Systems	1943	
7. Meets Applicable Standard Specifications	ASTMC552 HHI551E	
8. Compressive Strength (per ASTM C-165) or (Other); psi	100	
9. Water Absorption (per ASTM C-240) or (Other); % by vol.	0.2	
10. Flexural Strength (per ASTM C-203) or (Other); psi	80	
11. Common Available Sizes (Contact mfr. for other sizes and special orders)		
11.1 2'x4'	X	
11.2 3'x4'		
11.3 4'x4'		
11.4 4'x8'		
11.5 Other		
12. Common Available Thicknesses (Contact mfr. for other thicknesses), (C) Values, (R) Values, Weight/ft²		
12.1 Thickness; in inches	1.5	
Thermal Conductance (C) @ 40°F	.216	
@ 75°F	.233	
Thermal Resistance (R) @ 40°F	4.63*	
@ 75°F	4.29*	
Weight; lbs/ft²	1.1	
12.2 Thickness; in inches	2.0	
Thermal Conductance (C) @ 40°F	.162	
@ 75°F	.175	
Thermal Resistance (R) @ 40°F	6.17*	
@ 75°F	5.71*	
Weight; lbs/ft²	1.4	
12.3 Thickness; in inches	2.5	
Thermal Conductance (C) @ 40°F	.130	
@ 75°F	.140	
Thermal Resistance (R) @ 40°F	7.69*	
@ 75°F	7.14*	
Weight; lbs/ft²	1.75	
12.4 Thickness; in inches	3.0	
Thermal Conductance (C) @ 40°F	.108	
@ 75°F	.117	
Thermal Resistance (R) @ 40°F	9.26*	
@ 75°F	8.55*	
Weight; lbs/ft²	2.1	
12.5 Thickness; in inches	3.5	
Thermal Conductance (C) @ 40°F	.092	
@ 75°F	.100	
Thermal Resistance (R) @ 40°F	10.87*	
@ 75°F	10.00*	
Weight; lbs/ft²	2.45	
12.6 Thickness; in inches	4.0	
Thermal Conductance (C) @ 40°F	.081	
@ 75°F	.088	
Thermal Resistance (R) @ 40°F	12.35*	
@ 75°F	11.36*	
Weight; lbs/ft²	2.8	
13. Estimated % of Thermal Value Retention @ 1 year (Assuming a continuous mean temperature differential & constant moisture content) **5 years**	100	
10 years	100 100	
14. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)	P227, P508, P801	
15. Limitations and/or Restrictions		

* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: NA = Not available; N/A = Not applicable.

Phenolic
(Homogeneous Only) Roof Board Insulation
Products listed by alphabetic company name.

1. Company	Koppers Company, Inc.
2. State	PA
3. Product Trade Name	Exeltherm Xtra
4. Density (per ASTM D-1622) or (Other); lbs/ft³	2.5 Min
5. Surface Treatment: Top Surface	Corrugated Kraft Foil Laminate
Bottom Surface	Felt
6. Available as Tapered Material	NO
7. Year First Used in Commercial Roofing Systems	1982
8. Meets Applicable Standard Specifications	HHI1972
9. Compressive Strength (per ASTM D-1621) or (Other); psi	25
10. Water Absorption (per ASTM C-272) or (Other); % by volume	1.8
11. Common Available Sizes (Contact mfr. for other sizes and special orders)	
11.1 2′ x 4′	
11.2 3′ x 4′	X
11.3 4′ x 4′	
11.4 4′ x 8′	
11.5 Other	
12. Common Available Thicknesses (Contact mfr. for other thicknesses), (C) Values, (R) Values, Weight/ft²	
12.1 Thickness; in inches	1.2
Thermal Conductance (C) @ 40°F	
@ 75°F	.10
Thermal Resistance (R) @ 40°F	
@ 75°F	10.00
Weight; lbs/ft²	
12.2 Thickness; in inches	1.4
Thermal Conductance (C) @ 40°F	
@ 75°F	.085
Thermal Resistance (R) @ 40°F	
@ 75°F	11.67
Weight; lbs/ft²	
12.3 Thickness; in inches	1.5
Thermal Conductance (C) @ 40°F	
@ 75°F	.080
Thermal Resistance (R) @ 40°F	
@ 75°F	12.50
Weight; lbs/ft²	
12.4 Thickness; in inches	1.75
Thermal Conductance (C) @ 40°F	
@ 75°F	.068
Thermal Resistance (R) @ 40°F	
@ 75°F	14.58
Weight; lbs/ft²	
12.5 Thickness; in inches	2.0
Thermal Conductance (C) @ 40°F	
@ 75°F	.060
Thermal Resistance (R) @ 40°F	
@ 75°F	16.67
Weight; lbs/ft²	
12.6 Thickness; in inches	3.0
Thermal Conductance (C) @ 40°F	
@ 75°F	.040
Thermal Resistance (R) @ 40°F	
@ 75°F	25.00
Weight; lbs/ft²	
13. Estimated % of Thermal Value Retention @ 1 year	100
(Assuming a continuous mean temperature differential & constant moisture content) **5 years**	NA
10 years	NA
14. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)	See Appendix
15. Limitations and/or Restrictions	See Mfgr

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* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: (C) and/or (R) values supplied by manufacturer are in accordance with RIC/TIMA Roof Insulation Specimen Conditioning Procedure #281-1.

Note 3: NA = Not available; N/A = Not applicable.

Fiberboard
(Homogeneous Only) Roof Board Insulation
Products listed by alphabetic company name.

1. Company	Celotex Corporation The	Hubert Fiberboard Inc.	Owens Corning Fiberglas			
2. State	FL	MO	OH			
3. Product Trade Name	Fiberboard	HFB	O-C Wood Fiber RF Ins			
4. Surface Treatment: Top Surface		None	Impregnated Surface Treatment			
Bottom Surface	None	None	None			
5. Available as Tapered Material	NO	NO	NO			
6. Year First Used in Commercial Roofing Systems	1928	1961	1955			
7. Meets Applicable Standard Specifications	LLLI535B,C1s	C208-72 LLLI535B,C1sC PS57-73	C208-72 LLLI535B,C1sC			
8. Common Available Sizes (Contact mfr. for other sizes and special orders)						
8.1 2′x4′	X	X	X			
8.2 3′x4′						
8.3 4′x4′	X	X	X			
8.4 4′x8′			X			
8.5 Other						
9. Common Available Thicknesses (Contact mfr. for other thicknesses) Water Absorbtion, Transverse Strength,(C) Values, (R)Values, Wt./ft²						
9.1 Thickness; in inches	1/2	1/2	1/2			
Water Absorbt. (per ASTM C-209) or (Other); % by vol.		5 to 10				
Transverse Strength (per ASTM C-203) or (Other); psi		8				
Thermal Conductance (C) @ 40° F						
@ 75° F	.72		.72			
Thermal Resistance (R) @ 40° F						
@ 75° F	1.39*		1.39*			
Weight; lbs/ft²		.81	.63			
9.2 Thickness; in inches	1	3/4	3/4			
Water Absorbt. (per ASTM C-209) or (Other); % by vol.		5 to 10				
Transverse Strength (per ASTM C-203) or (Other); psi		12				
Thermal Conductance (C) @ 40° F						
@ 75° F	.36		.48			
Thermal Resistance (R) @ 40° F						
@ 75° F	2.78*		2.08*			
Weight; lbs/ft²		1.1	.92			
9.3 Thickness; in inches	1 1/2	1	1			
Water Absorbt. (per ASTM C-209) or (Other); % by vol.		5 to 10				
Transverse Strength (per ASTM C-203) or (Other); psi		15				
Thermal Conductance (C) @ 40° F						
@ 75° F	.24	.36	.36			
Thermal Resistance (R) @ 40° F						
@ 75° F	4.17*	2.78*	2.78*			
Weight; lbs/ft²		1.35	1.28			
9.4 Thickness; in inches	2	1 1/2	1 1/2			
Water Absorbt. (per ASTM C-209) or (Other); % by vol.						
Transverse Strength (per ASTM C-203) or (Other); psi						
Thermal Conductance (C) @ 40° F						
@ 75° F	.19	.24	.24			
Thermal Resistance (R) @ 40° F						
@ 75° F	5.26*	4.17*	4.17*			
Weight; lbs/ft²		2.3	1.93			
9.5 Thickness; in inches		2	2			
Water Absorbt. (per ASTM C-209) or (Other); % by vol.						
Transverse Strength (per ASTM C-203) or (Other); psi						
Thermal Conductance (C) @ 40° F						
@ 75° F		.19	.19			
Thermal Resistance (R) @ 40° F						
@ 75° F		5.26*	5.26			
Weight; lbs/ft²			2.6			
10. Estimated % of Thermal Value Retention @ 1 year		100	N/A			
(Assuming a continuous mean temperature differential & constant moisture content) **5 years**		100	N/A			
10 years		100	N/A			
11. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)						
12. Limitations and/or Restrictions	See Appendix	See Appendix	See Appendix			

* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: NA = Not available; N/A = Not applicable.

Perlite
(Homogeneous Only)
Roof Board Insulation

Products listed by alphabetic company name.

1. Company	Celotex Corporation, The	GAF Corporation	Int'l Permalite Inc	Lucas Sales Company, Inc	Manville Bldg Mat'ls Corp	Manville Bldg Mat'ls Corp			
2. State	FL	NJ	CA	MO	CO	CO			
3. Product Trade Name	Celo-Therm Perlite	GAFTemp Perlite	Permalite Sealskin	Lucas Tapered Sys	Fesco Board	1/2 Retro-fit Board			
4. Surface Treatment: Top Surface	Coated	Impregnated	Coated To LimitBitumen Soak-up	Impregnated with Asphalt	Impregnated	Impregnated			
Bottom Surface	None	None	None	Saw Cut Surface	None	None			
5. Available as Tapered Material	NO	NO	YES	YES (Only)	YES	NO			
6. Year First Used in Commercial Roofing Systems	1962			1974	1958	1982			
7. Meets Applicable Standard Specifications	HHI529b ASTMC208	HHI529b ASTMC728	HHI529b ASTMC728	HHI529b ASTMC728	HHI529b ASTMC728-72				
8. Compressive Strength (per ASTM C-165) or (Other); psi	35	35	35	35	35	24-40			
9. Water Absorption (per ASTM C-209) or (Other); % by vol.	1.5		1.2	1.2	1.5	<7			
10. Flexural Strength (per ASTM C-203) or (Other); psi		40	60	60	40				
11. Common Available Sizes (Contact mfr. for other sizes and special orders)									
11.1 2'x4'	X		X	X	X	X			
11.2 3'x4'			X						
11.3 4'x4'						X			
11.4 4'x8'									
11.5 Other									
12. Common Available Thicknesses (Contact mfr. for other thicknesses), (C) Values, (R) Values, Weight/ft²									
12.1 Thickness; in inches	.3/4	.75	.50	Offered As A	.75	.50			
Thermal Conductance (C) @ 40° F			.66	Tapered Sys-					
@ 75° F	.48	.48	.72	tem. Thick-	.48	.72			
Thermal Resistance (R) @ 40° F			1.52*	ness and C&R					
@ 75° F	2.08*	2.08*	1.39*	Value are	2.08*	1.39*			
Weight; lbs/ft²		.6	.45	Dependent on	.6	.4			
12.2 Thickness; in inches	1.0	1.0	.75	Thermal and	1.0				
Thermal Conductance (C) @ 40° F			.43	Drainage					
@ 75° F	.36	.36	.48	Design Req-	.36				
Thermal Resistance (R) @ 40° F			2.33*	uirements.					
@ 75° F	2.78*	2.78*	2.08*	K @75F=.36	2.78*				
Weight; lbs/ft²		.8	.68		.8				
12.3 Thickness; in inches	1 1/2	1.5	1.0	1.0	1.5				
Thermal Conductance (C) @ 40° F			.32						
@ 75° F	.24	.24	.36	.36	.24				
Thermal Resistance (R) @ 40° F			3.13*						
@ 75° F	4.17*	4.17*	2.78*	2.78	4.17*				
Weight; lbs/ft²		1.2	.90		1.2				
12.4 Thickness; in inches	2.0	2.0	1.5	2.0	2.0				
Thermal Conductance (C) @ 40° F			.22						
@ 75° F	.18	.18	.24	.18	.18				
Thermal Resistance (R) @ 40° F			4.55*						
@ 75° F	5.56*	5.56*	4.17*	5.56	5.56*				
Weight; lbs/ft²		1.6	1.35	1.6	1.6				
12.5 Thickness; in inches			2.0	3.0	3.0				
Thermal Conductance (C) @ 40° F			.16						
@ 75° F			.18	.12	.12				
Thermal Resistance (R) @ 40° F			6.25*						
@ 75° F			5.56*	8.33	8.33*				
Weight; lbs/ft²			1.8	2.4	2.4				
12.6 Thickness; in inches			3.0						
Thermal Conductance (C) @ 40° F			.11						
@ 75° F			.12						
Thermal Resistance (R) @ 40° F			9.09*						
@ 75° F			8.33*						
Weight; lbs/ft²			2.7						
13. Estimated % of Thermal Value Retention @ 1 year			100	100	100	100			
(Assuming a continuous mean temperature 5 years			100	100	100	100			
differential & constant moisture content) 10 years			100	100	100	100			
14. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)		See Appendix	See Appendix	See Appendix	See Appendix				
15. Limitations and/or Restrictions	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix			

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* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: NA = Not available; N/A = Not applicable.

Polyurethane
(Homogeneous Only)
Roof Board Insulation

Products listed by alphabetic company name.

1. Company	GAF Corporation	Manville Bldg Mat'ls Corp	Manville Bldg Mat'ls Corp	NRG Barriers, Inc					
2. State	NJ	CO	CO	ME					
3. Product Trade Name	GAFTemp Urethane	Ultra Thane SP	Ultra Thane	Barrier Board					
4. Density (per ASTM D-1622) or (Other); lbs/ft³	2.0 Min	2.22 - 2.54	2.52 - 3.11	2.0 Min					
5. Surface Treatment: Top Surface	Asphalt Impregnated Facer	Non-Asphalt Facer	Fiber Glass Asphaltic Facer	a. Asph/FG b. Foil/FG c.Non-Ash/FG					
Bottom Surface	Asphalt Impregnated Facer	Non-Asphalt Facer	Fiber Glass Asphaltic Facer	a. Asph/FG b. Foil/FG c.Non-Ash/FG					
6. Available as Tapered Material	NO	NO	NO	YES					
7. Year First Used in Commercial Roofing Systems	1979	1983	1983	1980					
8. Meets Applicable Standard Specifications	HHI1972/2	HHI1972/Gen	HHI1972/Gen	HHI1972/2					
9. Compressive Strength (per ASTM D-1621) or (Other); psi	(D1621) >17	16 Min	16 Min	(D1621) 25					
10. Flexural Strength (per ASTM C-466) or (Other); psi	(C209) 20Min		N/A	NA					
11. Common Available Sizes (Contact mfr. for other sizes and special orders)									
11.1 2'x4'				X					
11.2 3'x4'	X	X	X	X					
11.3 4'x4'				X					
11.4 4'x8'	X	X		X					
11.5 Other				X					
12. Common Available Thicknesses (Contact mfr. for other (C) Values, (R)Values, Weight/ft² thicknesses)									
12.1 Thickness; in inches	1.0	1.3	1.3	1.0					
Thermal Conductance (C) @ 40° F @ 75° F	.16	.12	.12	.139					
Thermal Resistance (R) @ 40° F @ 75° F	6.25*	8.33*	8.33*	7.19*					
Weight; lbs/ft²		.3	.3	.21					
12.2 Thickness; in inches	1.3	1.5	1.5	1.5					
Thermal Conductance (C) @ 40° F @ 75° F	.12	.10	.10	.093					
Thermal Resistance (R) @ 40° F @ 75° F	8.33*	10.00*	10.00*	10.75*					
Weight; lbs/ft²		.3	.3	.29					
12.3 Thickness; in inches	1.5	1.8	1.8	2.0					
Thermal Conductance (C) @ 40° F @ 75° F	.10	.08	.08	.070					
Thermal Resistance (R) @ 40° F @ 75° F	10.00*	12.50*	12.50*	14.29*					
Weight; lbs/ft²		.4	.4	.37					
12.4 Thickness; in inches	1.8	2.0	2.0	2.5					
Thermal Conductance (C) @ 40° F @ 75° F	.08	.07	.07	.056					
Thermal Resistance (R) @ 40° F @ 75° F	12.50*	14.29*	14.29*	17.86*					
Weight; lbs/ft²		.5	.5	.45					
12.5 Thickness; in inches	2.3	2.3	2.3	3.0					
Thermal Conductance (C) @ 40° F @ 75° F	.06	.06	.06	.046					
Thermal Resistance (R) @ 40° F @ 75° F	16.67*	16.67*	16.67*	21.74*					
Weight; lbs/ft²		.5	.5	.54					
12.6 Thickness; in inches	2.7	2.7	2.7	4.0					
Thermal Conductance (C) @ 40° F @ 75° F	.05	.05	.05	.035					
Thermal Resistance (R) @ 40° F @ 75° F	20.00*	20.00*	20.00*	28.57*					
Weight; lbs/ft²		.6	.6	.71					
13. Estimated % of Thermal Value Retention @ 1 year (Assuming a continuous mean temperature differential & constant moisture content) **5 years** **10 years**	NA NA NA	NA NA NA	NA NA NA	NA NA NA					
14. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)									
15. Limitations and/or Restrictions	See Appendix	See Appendix	See Appendix						

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* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: (C) and/or (R) values supplied by manufacturer are in accordance with RIC/TIMA Roof Insulation Specimen Conditioning Procedure #281-1.

Note 3: NA = Not available; N/A = Not applicable.

Polyisocyanurate (Homogeneous Only) Roof Board Insulation

Products listed by alphabetic company name.

1. Company	American Western	American Western	American Western	American Western	American Western	Apache Bldg Products Company	Apache Bldg Products Company	Celotex Corporation, The	GAF Corporation
2. State	AZ	AZ	AZ	AZ	AZ	NJ	NJ	FL	NJ
3. Product Trade Name	G-450 R-Board	AL-100 R-Board	AL-200 R-Board	G-3003 R-Board	G-300 R-Board	White Line Pyrox-Plus	White Line Pyrox,	Thermax Hy-Tec RF Insul	GAFTemp Isotherm
4. Density (per ASTM D-1622) or (Other); lbs/ft³	2 Nominal	2 Nominal	2 Nominal	2 Nominal	2 Nominal	2.0	2.0	2 Nominal	2.0 Min
5. Surface Treatment: Top Surface	Special #1279 Paper Paced (Non-Coated)	Foil-Krft Facd Both Sides(One Side Perfratd)	Pure Foil/ Glass Facer	Asphalt Saturated Fiber glass Facer	Asphalt Saturated Fiber glass Facer	Thick White Fibers Glass Mat	White Fibr ous Glass Mat	Facer	Asphalt Impregnated Facer
Bottom Surface	Special #1279 Paper Paced (Non-Coated)	Foil-Krft Facd Both Sides(One Side Perfratd)	Pure Foil/ Glass Facer	Asphalt Saturated Fiber glass Facer	Asphalt Saturated Fiber glass Facer	Coated Fibrous Glass Mat	White Fibrous Glass Mat	Facer	Asphalt Impregnated Facer
6. Available as Tapered Material	NO	NO	NO	NO	NO	YES	YES	NO	NO
7. Year First Used in Commercial Roofing Systems	1982	1982	1982	1982	1982	1982	1982	1983	1981
8. Meets Applicable Standard Specifications	HHI19721,530A ASTM E84 Cls 1 UBC42-1,UL-723	HHI19721,530A ASTM E84 Cls 1 UBC42-1,UL-723	HHI19721,530A ASTM E84 Cls 1 UBC42-1,UL-723	HHI19721,530A ASTM E84 Cls 1 UBC42-1,UL-723	HHI19721,530A ASTM E84 Cls 1 UBC42-1,UL-723	HHI1972	HHI1972	HHI1972	HHI1972/2 Class 1
9. Compressive Strength (per ASTM D-1621) or (Other); psi	25	25	25	25	25	20	20	20 Nominal	25
10. Water Absorption (per ASTM C-272) or (Other); % by volume	(C-355-62T)2.0	(C-355-62T)2.0	(C-355-62T)2.0	(C-355-62T)2.0	(C-355-62T)2.0	<1.0	<1.0	MOD .C209 <1	
11. Common Available Sizes (Contact mfr. for other sizes and special orders)									
11.1 2′ × 4′									
11.2 3′ × 4′	X	X	X	X	X			X	X
11.3 4′ × 4′						X	X	X	
11.4 4′ × 8′	X	X	X	X	X	X	X	X	X Spec Order
11.5 Other	Custom								
12. Common Available Thicknesses (Contact mfr. for other thicknesses), (C) Values, (R) Values, Weight/ft²									
12.1 Thickness; in inches	1.0	1.0	1.0	1.5	1.0	1.0	1.0	1.0	1.4
Thermal Conductance (C) @ 40°F									
@ 75°F	.135	.136	.136	.090	.135	.15	.15	.17	.12
Thermal Resistance (R) @ 40°F									
@ 75°F	7.41*	7.35*	7.35*	11.11*	7.41*	6.7	6.7	5.88*	8.33*
Weight; lbs/ft²	.37	.166	.166	.44	.37	.25	.25		NA
12.2 Thickness; in inches	1.5	1.5	1.5	1.75	1.5	1.5	1.5	1.4	1.6
Thermal Conductance (C) @ 40°F									
@ 75°F	.090	.091	.091	.077	.090	.10	.10	.12	.10
Thermal Resistance (R) @ 40°F									
@ 75°F	11.11*	10.99*	10.99*	12.99*	11.11*	10.0	10.0	8.33*	10.00*
Weight; lbs/ft²	.44	.23	.23	.513	.44	.33	.33		NA
12.3 Thickness; in inches	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.6	1.8
Thermal Conductance (C) @ 40°F									
@ 75°F	.068	.065	.065	.068	.068	.07	.07	.10	.09
Thermal Resistance (R) @ 40°F									
@ 75°F	14.71*	15.38*	15.38*	14.71*	14.71*	14.3	14.3	10.00*	11.11*
Weight; lbs/ft²	.518	.30	.30	.518	.518	.43	.43		NA
12.4 Thickness; in inches	2.5	2.5	2.5	2.5	2.5	2.8	2.8	2.0	2.0
Thermal Conductance (C) @ 40°F									
@ 75°F	.054	.054	.054	.054	.054	.05	.05	.08	.08
Thermal Resistance (R) @ 40°F									
@ 75°F	18.52*	18.52*	18.52*	18.52*	18.52*	20.0	20.0	12.50*	12.50*
Weight; lbs/ft²	.593	.366	.366	.593	.593	.54	.54		NA
12.5 Thickness; in inches	3.0	3.0	3.0	2.75	3.0	3.4	3.4	2.5	2.3
Thermal Conductance (C) @ 40°F									
@ 75°F	.045	.045	.045	.049	.045	.04	.04	.06	.07
Thermal Resistance (R) @ 40°F									
@ 75°F	22.22*	22.22*	22.22*	20.41*	22.22*	25.0	25.0	16.67*	14.29*
Weight; lbs/ft²	.67	.43	.43	.65	.67	.63	.63		NA
12.6 Thickness; in inches	3.5	3.5	3.5	3.0	3.5	4.1	4.1	3.0	3.1
Thermal Conductance (C) @ 40°F									
@ 75°F	.039	.038	.038	.045	.039	.033	.033	.05	.05
Thermal Resistance (R) @ 40°F									
@ 75°F	25.64*	26.32*	26.32*	22.22*	25.64*	30.0	30.0	20.00*	20.00*
Weight; lbs/ft²	.78	.50	.50	.67	.78	.72	.72		NA
13. Estimated % of Thermal Value Retention @ 1 year (Assuming a continuous mean temperature differential & constant moisture content) 5 years									NA
10 years									NA
									NA
14. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)	See Appendix	See Appendix	See Appendix		See Appendix	See Appendix	See Appendix		
15. Limitations and/or Restrictions	See Appendix	See Appendix	See Appendix		See Appendix	See Appendix	See Appendix	See Appendix	See Appendix

* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: (C) and/or (R) values supplied by manufacturer are in accordance with RIC/TIMA Roof Insulation Specimen Conditioning Procedure #281-1.

Note 3: NA = Not available; N/A = Not applicable.

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Polyisocyanurate (Homogeneous Only) Roof Board Insulation

Products listed by alphabetic company name.

Homasote Company NJ	Homasote Company NJ	Internat'l Permalite, Inc CA	Internat'l Permalite, Inc CA	Manville Bldg Mat'ls Corp CO	Manville Bldg Mat'ls Corp CO	NRG Barriers, Inc ME	Owens-Corning Fiberglas OH	Poly Fab Industries, Inc MN	Poly Fab Industries, Inc MN	Poly Fab Industries, Inc MN	Rmax, Inc TX
Ultra/C-1	Ultra/M	Permalite Iso-Lite	Permalite Iso-Thane	Ultra Gard SP	Ultra Gard	Enrgy-1	OC Foam Roof Insulation	Lithane BUR	Lithane M	Lithane X	Max-1
2.0	2.0	(D1622) 2.0	(D1622) 2.0	2.29 - 2.63	2.40 - 3.15	2.0 Min	2.0	2.0 Nominal	2.0 Nominal	2.0 Nominal	2.0
Asphalt Saturated Fiberglass Facer	Foil Laminate Facer	Various Facers	Various Facers	Non-Asphalt Facer	Fiberglass Asphaltic Facer	Asphalt Fiberglass	Emulsified Asph Glass Fiber Facing	Asphalt Emulsified Glas Fiber Mat	Foil Faced Kraft Paper	Fiberglass Reinforced Facer	Asphalt Coated FG Felt
Asphalt Saturated Fiber Glass Facer	Foil Laminate Facer	Various Facers	Various Facers	Non-Asphalt Facer	Fiberglass Asphaltic Facer	Asphalt Fiberglass	Emulsified Asph Glass Fiber Facing	Asphalt Emulsified Glas Fiber Mat	Foil Faced Kraft Paper	Fiberglass Reinforced Facer	Asphalt Coated FG Felt
NO	NO	NO	NO	NO	NO	YES	NO		NO	NO	NO
1982	1983	1982	1968	1983	1983		1983				1982
HHI1972/2	HHI1972/1	HHI1972	HHI1972	HHI1972/Gen	HHI1972/Gen	HHI1972/1&2 Class 2	HHI1972/2	See Appendix	See Appendix	See Appendix	
25	25	25 (C209) 1.2	25 (C209) 1.2	16 Min (C209) 1 Max	16 Min (C209) 1 Max	25 (C209-72) <1	20 Min <1.0	>30 <1.0	>30 <1.0	>30 >1.0	25 <1.0
						X					
X		X	X	X	X	X	X			X	
						X					X
X	X			X		X	X		X	X	X
1.3	.8	1.0	1.0	1.4	1.4	1.4	1.0	1.0	1.0	1.2	1.30
.12	.18	.14 .16	.14 .16	.12	.12	.100	.16	.138	.138	.116	.123*
8.33*	5.56*	7.14* 6.25*	7.14* 6.25*	8.33*	8.33*	10.00*	6.25	7.25*	7.25*	8.62*	8.1
.52	.17	.23	.23	.3	.3	.28	.23	.18	.17	.22	.29
1.4	1.0	1.4	1.4	1.6	1.6	2.0	1.3	1.5	1.5	1.6	1.50
.11	.14	.11 .12	.11 .12	.10	.10	.070	.12	.092	.092	.086	.106*
9.09*	7.14*	9.09* 8.33*	9.09* 8.33*	10.00*	10.00*	14.29*	8.33*	10.87*	10.87*	11.63*	9.4
.57	.22	.28	.26	.4	.4	.37	.34	.28	.26	.29	.33
1.6	1.5	1.6	1.6	2.0	2.0	2.25	1.5	2.0	2.0	2.0	1.75
.10	.09	.09 .10	.09 .10	.08	.08	.062	.10	.069	.069	.069	.091*
10.00*	11.11*	11.11* 10.00*	11.11* 10.00*	12.50*	12.50*	16.13*	10.00*	10.87*	14.92*	14.92*	10.9
.61	.34	.33	.33	.4	.4	.41	.38	.37	.35	.37	.37
2.0	2.0	2.0	2.0	2.3	2.3	2.5	1.8	2.6	2.5	2.5	2.00
.08	.07	.07 .08	.07 .08	.07	.07	.056	.08	.053	.055	.055	.080*
12.50*	14.29*	14.29* 12.50*	14.29* 12.50*	14.29*	14.29*	17.86*	12.50	18.87*	18.18*		12.5
.69	.45	.39	.39	.5	.5	.45	.42	.48	.44	.46	.41
2.5	2.5	2.5	2.5	2.7	2.7	3.0	2.7	3.0	3.0	3.0	2.50
.06	.06	.05 .06	.05 .06	.06	.06	.046	.05	.046	.046	.046	.064*
16.67*	16.67*	20.00* 16.67*	20.00* 16.67*	16.67*	16.67*	21.74*	20.00*	21.74*	21.74*	18.18*	15.6
.72	.56	.48	.48	.6	.6	.54	.57	.55	.53	.55	.49
3.0	3.0	3.0	3.0	3.2	3.2	3.5	3.4	4.0	4.0	4.0	3.00
.05	.05	.04 .05	.045 .05	.05	.05	.040	.04	.034	.034	.034	.053*
20.00*	20.00*	22.22* 20.00*	22.22* 20.00*	20.00*	20.00*	25.00*	25.00	29.41*	29.41*	29.41*	18.8
.79	.68	.57	.57	.6	.6	.62	.70	.73	.70	.73	.58
		NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	99 95 95
			BOCA 83-36 SBCCI 8392								
See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	

Polyisocyanurate (Homogeneous Only) Roof Board Insulation

Products listed by alphabetic company name.

1. Company	Rmax, Inc	Rmax, Inc	Rmax, Inc	Temple, Eastex, Inc Bldg Prod DV TX	Temple-Eastex, Inc Bldg Prod DV TX	Temple-Eastex, Inc Bldg Prod DV TX	Thermal Systems, Inc UT	Thermal Systems, Inc UT	Win-Tec, Inc IL
2. State	TX	TX	TX						
3. Product Trade Name	Ply-1	Thermaroof Standard	Thermaroof Plus	Tempro Standard	Tempro	Tempro S.P.	Thermalglas	Standard RF Insulation	R-U-K Board GL-100
4. Density (per ASTM D-1622) or (Other); lbs/ft³	2.0	2.0	2.0	2.0 Nominal	2.0 Nominal	2.0 Nominal	2.20 Nominal	2 Nominal	2.0 Nominal
5. Surface Treatment: Top Surface	Fiberglass Reinforced Alum Foil	Asphalt Coated FG Felt	Fiberglass Reinforced Alum Foil	Glass Reinforced,Saturated Facers	White, Glass Reinforced, Saturtd FCR	Glass Reinforced Alum Foil Facers	Fiberglas Foil Non-Asph FG	Kraft Foil, Asph Sat Flt Non-Asph FG	Reinforced Aluminum Foil
Bottom Surface	Fiberglass Reinforced Alum Foil	Asphalt Coated FG Felt	Fiberglass Reinforced Alum Foil	Glass Reinforced,Saturated Facers	White, Glass Reinforced, Saturtd FCR	Glass Reinforced Alum Foil Facers	Fiberglass Foil, Non-Asph FG	Kraft Foil, Asph Sat Flt Non-Asph FG	Reinforced Aluminum Foil
6. Available as Tapered Material	NO	NO	NO	NO	NO	NO	YES	YES	NO
7. Year First Used in Commercial Roofing Systems	1981	1979	1980	1983	1983	1983	1982	1982	1982
8. Meets Applicable Standard Specifications	HHI1972/1	HHI1972/2	HHI1972/1	HHI1972/2 CL #1,ASTME-84, Class #1	HHI1972/2 CL#1,ASTM E-84,Class #1	HHI1972/1,CL #1,ASTME-84 Class #1	HHI1972 FM Class 1	HHI1972/Gen	HHI1972/1, HHI530
9. Compressive Strength (per ASTM D-1621) or (Other); psi	25	25		25 Minimum	25 Minimum	25 Minimum	25 Minimum	25 Min	25
10. Water Absorption (per ASTM C-272) or (Other); % by volume	<1.0	<1.0					<1.0	<1	
11. Common Available Sizes (Contact mfr. for other sizes and special orders)									
11.1 2′ × 4′								X	
11.2 3′ × 4′		X					X	X	
11.3 4′ × 4′	X	X		X	X	X	X		X
11.4 4′ × 8′				X	X	X			
11.5 Other									
12. Common Available Thicknesses (Contact mfr. for other thicknesses), (C) Values, (R) Values, Weight/ft²									
12.1 Thickness; in inches	1.25	1.00	1.00	1.0	1.0	1.0	1.4	1.0	1.2
Thermal Conductance (C) @ 40°F									
@ 75°F	.111*	.158*	.138*	.150	.150	.139	.093	.13	.116
Thermal Resistance (R) @ 40°F									
@ 75°F	9.0	6.3	7.2	6.67*	6.67*	7.14*	10.75*	7.69*	8.6
Weight; lbs/ft²	.25	.24	.21	.20	.20	.21	.27	.21	.25
12.2 Thickness; in inches	1.50	1.25	1.25	1.25	1.25	1.2	1.5	1.5	1.4
Thermal Conductance (C) @ 40°F									
@ 75°F	.092*	.128*	.111*	.120	.120	.116	.087	.087	.100
Thermal Resistance (R) @ 40°F									
@ 75°F	10.8	7.8	9.0	8.33*	8.33*	8.62*	11.49*	11.49*	10.00*
Weight; lbs/ft²	.29	.28	.25	.24	.24	.25	.29	.29	.28
12.3 Thickness; in inches	1.75	1.50	1.50	1.5	1.5	1.5	2.0	2.0	2.0
Thermal Conductance (C) @ 40°F									
@ 75°F	.079*	.091*	.079*	.100	.100	.093	.065	.065	.069
Thermal Resistance (R) @ 40°F									
@ 75°F	12.6	10.9	10.8	10.00*	10.00*	10.75*	15.38*	15.38*	14.4
Weight; lbs/ft²	.33	.37	.29	.29	.29	.30	.37	.37	.39
12.4 Thickness; in inches	2.0	2.00	2.00	2.0	2.0	2.0	2.5	2.5	2.5
Thermal Conductance (C) @ 40°F									
@ 75°F	.069*	.080*	.069*	.075	.075	.069	.052	.052	.055
Thermal Resistance (R) @ 40°F									
@ 75°F	14.4	12.5	14.4	13.33*	13.33*	14.49*	19.23*	19.23*	18.18*
Weight; lbs/ft²	.37	.44	.38	.375	.37	.39	.45	.45	.47
12.5 Thickness; in inches	2.5	2.50	2.50	2.5	2.5	2.5	3.0	3.0	3.0
Thermal Conductance (C) @ 40°F									
@ 75°F	.055*	.064*	.055*	.060	.060	.056	.043	.043	.046
Thermal Resistance (R) @ 40°F									
@ 75°F	18.0	15.6	18.0	16.67*	16.67*	17.86*	23.26*	23.26*	21.74*
Weight; lbs/ft²	.46	.49	.46	.46	.46	.47	.54	.54	.57
12.6 Thickness; in inches	3.00	3.00	3.00	3.00	3.00	3.0	4.0	4.0	4.0
Thermal Conductance (C) @ 40°F									
@ 75°F	.046*	.053*	.046*	.050	.050	.046	.033	.033	.035
Thermal Resistance (R) @ 40°F									
@ 75°F	21.6	18.8	21.6	20.00*	20.00*	21.74*	30.30*	30.30*	28.57*
Weight; lbs/ft²	.54	.58	.54	.54	.54	.56	.71	.71	.74
13. Estimated % of Thermal Value Retention @ 1 year	99	99	99				99	99	85
(Assuming a continuous mean temperature differential & constant moisture content) 5 years	95	95	95				98	98	85
10 years	95	95	95				96	96	85
14. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)									
15. Limitations and/or Restrictions	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix	See Appendix

* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: (C) and/or (R) values supplied by manufacturer are in accordance with RIC/TIMA Roof Insulation Specimen Conditioning Procedure #281-1.

Note 3: NA = Not available; N/A = Not applicable.

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Polyisocyanurate (Homogeneous Only) Roof Board Insulation

Products listed by alphabetic company name.

Win-Tec, Inc IL	Win-Tec, Inc IL										
R-U-K Board GF-100	R-U-K Board KFL/150										
2.0 Nominal	2.0 Nominal										
Asphalt Saturated Fiber Glass	Kraft/Foil Facer										
Asphalt Saturated Fiber Glass	Kraft/Foil Facer										
NO	NO										
1982	1983										
HHI530, HHI1972/2	HHI530, HHI1972/1										
25	25										
X											
X	X										
1.2	1.0										
.141	.139										
7.1 .25	7.2 .23										
1.6	1.5										
.100	.093										
10.00* .31	10.8 .31										
2.0	2.0										
.080	.069										
12.50* .39	14.92* .39										
2.6	2.5										
.060	.056										
16.67* .50	17.86* .47										
3.0	3.0										
.050	.046										
20.00* .57	21.74* .57										
3.8	4.0										
.040	.035										
25.00* .72	28.57* .74										
80 80 80	85 85 85										
See Appendix	See Appendix										

Composite
Roof Board Insulation
Products listed by alphabetic company name.

1. Company	American Western Mfg	Arco Chemical Company	Arco Chemical Company	Arco Chemical Company	Carlisle Syntec Systems	Celotex Corporation The	Cornell Corp.	Dow Chemical, USA	EPS Molding Inc.
2. State	AZ	PA	PA	PA	PA	FL	WI	OH	TX
3. Product Trade Name	CP-500 R-Board	Arcor SP	Arcor FMI	Arcor MB	Sure Seal EPS/Fibrbd	Thermax Hy-Tec Plus	Thermacal	Strofoam Light Guard	EPS-Lite
4. Composite Components:									
4.1 Expanded Polystyrene		X	X	X	X				X
4.2 Extruded Polystyrene								X	
4.3 Polyurethane							X		
4.4 Polyisocyanurate	X					X			
4.5 Perlite	X								X
4.6 Gypsum Board									
4.7 Fiber Board					X				
4.8 Plywood						X			
4.9 Other		X	X	X			Waferboard	Latex-Core	
4.10 Other									
5. Surface Treatment:									
5.1 Asphalt Roofing Felt							X	None	X
5.2 Foil Facer									X
5.3 Kraft Facer									X
5.4 Other	X								
5.5 Other									
6. Available as Tapered Material	NO	YES	YES	YES	YES			NO	YES
7. Year First Used in Commercial Roofing Systems	1982	1983	1983	1983	1981	1983	1979	1976	1978
8. Common Available Sizes (Contact mfr. for other sizes and special orders)									
8.1 2′x4′								X	
8.2 3′x4′	X								
8.3 4′x4′	X	X	X	X	X				X
8.4 4′x8′	X								X
8.5 Other						X	X		
8.6 Other									
9. Common Available Thicknesses (Contact mfr. for other thicknesses), (C) Values, (R) Values, Weight/ft²									
9.1 Thickness; in inches	1.5	2.9	3.1	2.9	1.5	1.5	1 1/2	2	2
Thermal Conductance (C) @ 75° F	.113	.10	.10	.10	.196	.15	.13*	.10	.147
Thermal Resistance (R) @ 75° F	8.85*	10.00*	10.00*	10.00*	5.10*	6.66*	7.2	10.00*	6.80*
Weight; lbs/ft²	.80	.83	1.45	.83	.875		1.8	4.4	1.5
9.2 Thickness; in inches	2.1	3.1	3.3	3.1	2.0	1.6	2	3	2.5
Thermal Conductance (C) @ 75° F	.080	.09	.09	.09	.142	.13	.09*	.062	.114
Thermal Resistance (R) @ 75° F	12.50*	11.11*	11.11*	11.11*	7.04*	7.69*	10.3	14.92*	8.77*
Weight; lbs/ft²	1.12	.85	1.47	.85	.916		1.9	4.6	1.58
9.3 Thickness; in inches	2.75	3.5	3.7	3.5	2 1/2	1.8	2 1/2	3.5	3
Thermal Conductance (C) @ 75° F	.062	.08	.08	.08	.112	.11	.07*	.057	.093
Thermal Resistance (R) @ 75° F	16.13*	12.50*	12.50*	12.50*	8.93*	9.09*	13.4	17.54*	10.75*
Weight; lbs/ft²	1.21	.88	1.52	.88	.958		2.0	4.7	1.7
9.4 Thickness; in inches	3.1	3.9	4.2	3.9	3.0	2.0	3		
Thermal Conductance (C) @ 75° F	.055	.07	.07	.07	.092	.10	.06*		
Thermal Resistance (R) @ 75° F	18.18*	14.29*	14.29*	14.29*	10.87*	10.00*	16.6		
Weight; lbs/ft²	1.36	.92	1.54	.92	1.0		2.1		
9.5 Thickness; in inches	3.25	4.6	4.8	4.6	3.5	2.3	3 1/2		
Thermal Conductance (C) @ 75° F	.052	.06	.06	.06	.078	.08	.05*		
Thermal Resistance (R) @ 75° F	19.23*	16.67*	16.67*	16.67*	12.82*	12.50*	19.7		
Weight; lbs/ft²	1.42	.97	1.59	.97	1.04		2.2		
9.6 Thickness; in inches	3.50	5.5	5.7	5.5	4.0	3.3	4		
Thermal Conductance (C) @ 75° F	.048	.05	.05	.05	.068	.05	.04*		
Thermal Resistance (R) @ 75° F	20.83*	20.00*	20.00*	20.00*	14.71*	20.00*	22.8		
Weight; lbs/ft²	1.53	1.04	1.66	1.04	1.08		2.3		
10. Estimated % of Thermal Value Retention @ 1 year		100	100	100	80		100	100	
(Assuming a continuous mean temperature differential & constant moisture content) **5 years**		100	100	100	80		90	100	
10 years		100	100	100	80			97	100
11. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)	See Appendix	ICBO 3530 BOCA 82-62 SBCCI 74200	ICBO 3530 BOCA 82-62 SBCCI 74200	ICBO 3530 BOCA 82-62 SBCCI 74200		ICBO 1712 BOCA 1317.0 SBCCI 717		See Appendix	
12. Limitations and/or Restrictions	See Appendix					See Appendix	See Appendix	See Appendix	

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* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: NA = Not available; N/A = Not applicable.

Composite
Roof Board Insulation
Products listed by alphabetic company name.

EPS Molding Inc. TX	EPS Molding Inc. TX	EPS Molding Inc. TX	Energy Industries, Inc SD	Energy Industries, Inc SD	Energy Industries, Inc SD	Energy Industries, Inc SD	Falcon Mfg MI	Falcon Mfg MI	GAF Corporation NJ	GAF Corporation NJ	Homasote Company NJ
EPS-Perl	EFB	Ply-Board	Permafoam Composite	Enercept Roof Panels	Permafoam Composite	Permafoam Composite	Falcon Foam Composite	Falcon Foam Composite	GAFTEMP Ureth/Perlit	GAFTemp Isol/Perlite	NCFR Thermasote
X	X	X	X	X	X	X	X	X			
									X		
					X				X	X	X
X				X			X		X	X	
	X					X		X			
		X	X	X							
											X
X	X	X									
X	X	X					X				X
X	X	X					X				
									X	X	
NO	YES	YES	YES	NO	YES	YES	YES				
1978	1978	1978	1977	1982	1977	1977	1979	1979	1979	1982	1983
							X	X			
	X		X		X	X	X	X			
X	X	X		X							X
				4x12 or 4x16					36"x 47 1/2"	X(36x47 1/2)	
1.5	1.5	1.5	2	8	2	2	3 3/4	3	1.5	2	1.2
.24	.193	.223	.10	.033	.10	.10	.072	.075	.15	.10	.18
4.16*	5.18*	4.48*	10.00*	30.30*	10.00*	10.00*	13.89*	13.33*	6.66*	10.00*	5.55*
4.24	1.58	2.88					.6	.7	N/A	N/A	1.2
2	2	2	4	6	4	4			1.7	2.4	1.5
.166	.141	.156	.06	.045	.05	.06			.13	.08	.14
6.02*	7.09*	6.41*	16.66*	22.22*	20.00*	16.66*			7.69*	12.50*	7.14*
4.28	1.62	2.92							N/A	N/A	1.2
2.5	2.5	2.5	6		6	6			1.8	2.7	2.0
.125	.11	.12	.04		.04	.04			.12	.07	.10
8.00*	9.09*	8.33*	25.00*		25.00*	25.00*			8.33*	14.28*	10.00*
4.32	1.66	2.96							N/A	N/A	1.5
			8		8	8			2.0	3.1	2.5
			.03		.03	.03			.10	.06	.073
			33.33*		33.33*	33.33*			10.00*	16.66*	13.69*
									N/A	N/A	1.6
									2.3	3.6	3.0
									.08	.05	.06
									12.50*	20.00*	16.66*
									N/A	N/A	1.8
									2.5		3.5
									.07		.05
									14.28*		20.00*
									N/A		1.9
			100	100	100	100		100	N/A	N/A	
			100	100	100	100		95	N/A	N/A	
100	100	100	100	100	100	100		94	N/A	N/A	
									See Appendix	See Appendix	See Appendix

Composite
Roof Board Insulation
Products listed by alphabetic company name.

1. Company	Homasote Company	Insulation Corp. of America	Insulation Corp. of America	Insulation Corp. of America	Insulation Corp. of America	Int'l. Permalite, Inc.	Int'l. Permalite, Inc.	Int'l. Permalite, Inc.	Manville Bldg. Mat'ls Corp.
2. State	NJ	PA	PA	PA	PA	CA	CA	CA	CO
3. Product Trade Name	Thermasote Nail Base	Insolite EPS/Fiberbd	Insolite EPS/Plywood	Insolite EPS/Perlite	Insolite EPS/Gypsmbd	Permalite PK	Permalite Iso-Perl	Permalite PK Plus	Fes-Core
4. Composite Components:									
4.1 Expanded Polystyrene		X	X	X	X				
4.2 Extruded Polystyrene									X
4.3 Polyurethane									
4.4 Polyisocyanurate	X					X	X	X	X
4.5 Perlite				X		X	X	X	X
4.6 Gypsum Board					X				
4.7 Fiber Board	X	X							
4.8 Plywood			X						
4.9 Other						X			
4.10 Other									
5. Surface Treatment:									
5.1 Asphalt Roofing Felt	X								
5.2 Foil Facer			X						
5.3 Kraft Facer			X						
5.4 Other	X						X		X
5.5 Other									
6. Available as Tapered Material		YES	YES	YES	YES				NO
7. Year First Used in Commercial Roofing Systems	1975	1979	1979	1979	1979	1962	1982	1974	1982
8. Common Available Sizes (Contact mfr. for other sizes and special orders)									
8.1 2'x4'		X	X	X	X				
8.2 3'x4'		X	X	X	X				X
8.3 4'x4'		X	X	X	X				
8.4 4'x8'	X	X	X	X	X				
8.5 Other									
8.6 Other									
9. Common Available Thicknesses (Contact mfr. for other thicknesses), (C) Values, (R) Values, Weight/ft²									
9.1 Thickness; in inches	1.2	1 1/2	1	1 3/4	1 5/8	1.5	1.5	2.4	1.9
Thermal Conductance (C) @ 75°F	.18	.19	.26	.14	.19	.15	.15	.10	.12
Thermal Resistance (R) @ 75°F	5.55*	5.26*	3.84*	7.14*	5.26*	6.66*	6.66*	10.00*	8.33*
Weight; lbs/ft²	1.2	1/2	1/12	3/4	2	.88	.88	1.6	1.2
9.2 Thickness; in inches	1.5	2.0	1 1/2	2 1/4	2 1/8	1.7	1.7	2.8	2.1
Thermal Conductance (C) @ 75°F	.14	.15	.17	.13	.17	.13	.13	.08	.10
Thermal Resistance (R) @ 75°F	7.14*	6.66*	5.88*	7.69*	5.88*		7.69*	12.50*	10.00*
Weight; lbs/ft²	1.3	5/8	1/8	1	2 1/8	.90	.90	1.67	1.3
9.3 Thickness; in inches	2.0	2 1/2	2	2 3/4	2 5/8	1.8	1.8	3.0	2.4
Thermal Conductance (C) @ 75°F	.10	.11	.13	.11	.13	.11	.12	.07	.08
Thermal Resistance (R) @ 75°F	10.00*	9.09*	7.69*	9.09*	7.69*	9.09*	8.33*	14.28*	12.50*
Weight; lbs/ft²	1.5	3/4	1/6	1 1/4	2 1/4	.92	.92	1.71	1.3
9.4 Thickness; in inches	2.5					2.0	2.0	3.3	2.7
Thermal Conductance (C) @ 75°F	.073					.10	.10	.06	.07
Thermal Resistance (R) @ 75°F	13.69*					10.00*	10.00*	16.66*	14.28*
Weight; lbs/ft²	1.6					.96	.96	1.78	1.4
9.5 Thickness; in inches	3.0					2.6	2.6	3.7	2.9
Thermal Conductance (C) @ 75°F	.06					.07	.07	.05	.06
Thermal Resistance (R) @ 75°F	16.66*					14.28*	14.28*	20.00*	16.66*
Weight; lbs/ft²	1.8					1.06	1.06	1.90	1.4
9.6 Thickness; in inches	4.0					3.3	3.3		3.2
Thermal Conductance (C) @ 75°F	.042					.05	.05		.05
Thermal Resistance (R) @ 75°F	23.80*					20.00*	20.00*		20.00*
Weight; lbs/ft²	2.1					1.19	1.19		1.4
10. Estimated % of Thermal Value Retention (Assuming a continuous mean temperature differential & constant moisture content) @ 1 year		100	100	100	100	N/A	N/A	N/A	No Data
5 years		100	100	100	100	N/A	N/A	N/A	No Data
10 years		100	100	100	100	N/A	N/A	N/A	No Data
11. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)	ICBO 1016 BOCA 79-76 SBCCI 717.1 SBCCI 717.2	P701-814 P801-815 P803	P701-814 P801-815 P803	P701-814 P801-815 P803	P701-814 P801-815 P803	P 225 P 252 ICBO 3549 BOCA 8336 SBCCI 8392		P 225 P 252 ICBO 3549 BOCA 8336 SBCCI 8392	
12. Limitations and/or Restrictions	See Appendix					See Appendix	See Appendix	See Appendix	

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* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: NA = Not available; N/A = Not applicable.

Composite
Roof Board Insulation
Products listed by alphabetic company name.

Manville Bldg. Matls. Corp. CO	NRG Barriers, Inc. ME	NRG Barriers, Inc. ME	Northwest EPS, Inc OR	Northwest EPS, Inc OR	Northwest EPS, Inc OR	Perma "R" Products, Inc TN	Perma "R" Products, Inc TN	Perma "R" Products, Inc TN	Poly Fab Ind., Inc. MN	Poly Fab Ind., Inc. MN	Poly Fab Ind., Inc. MN
Fesco-Foam	Barrier Board Plus	Nailboard	EPS-Fiberbd Composite	EPS-Perlite Composite	EPS-Gypsum Composite	Perma R Perlite Bd	Perma R Fiberbd	Perma R Gypsum Bd	Lithane Comp X-tra	Lithane Comp X-tra	Lithane Comp
			X	X	X	X	X	X			
X											
	X	X								X	X
X	X			X		X				X	X
					X			X			
			X				X				
		X									
	X	X									
	X	X									
X	X	X								X	X
NO	YES		YES	YES	YES	YES	YES	YES		NO	NO
1970	1980	1980	1981	1981	1981	1977	1982	1982		1982	1981
			X	X	X	X					
X	X	X								X	X
	X	X	X	X	X	X					
		X						X			
1.3	1.5	1.5	1 1/2	1 3/4	1 1/2	1.75	2.0	2.0	3	1.5	1.5
.15	.145	.131	.193	.169	.233	.16	.134	.16	.052	.116	.135
6.66*	6.89*	7.63*	5.18*	5.91*	4.29*	6.25*	7.46*	6.25*	19.23*	8.62*	7.40*
0.8		20.1	.753	.769	1.062	.24	.30	2.0	.96	.68	.92
1.5	1.75	2.0	2	2 1/4	2	2.0	2.5	2.5	3.3	1.8	1.6
.13	.120	.090	.14	.127	.161	.142	.106	.12	.047	.096	.121
7.69*	8.33*	11.11*	7.14*	7.87*	6.21*	7.04*	9.43*	8.33*	21.27*	10.41*	8.26*
0.8			.795	.811	1.104	.30	.311	2.1	1.01	.74	.93
1.8	2.0	2.5	2 1/2	2 3/4	2 1/2	2.5	3.0	3.0	3.5	2	1.8
.10	.096	.070	.11	.102	.123	.11	.088	.098	.043	.082	.107
10.00*	10.41*	14.28*	9.09*	9.80*	8.13*	9.09*	11.63*	10.20*	23.25*	12.19*	9.34*
0.9			.837	.853	1.146	.35	.32	2.2	1.05	.78	.97
2.1	2.25	3.0	3	3 1/4	3	3.0	3.5	3.5	3.8	2.3	2
.08	.082	.57	.091	.085	.099	.09	.073	.082	.040	.071	.09
12.50*	12.19*	17.54*	10.98*	11.76*	10.10*	11.11*	13.70*	12.20*	25.00*	14.08*	11.11*
0.9			.878	.845	1.187	.45	.33	2.3	1.11	.87	1.01
2.6	2.5	3.5	3 1/2	3 3/4	3 1/2	3.5	4.0	4.0	4	2.5	1.3
.06	.072	.048	.077	.073	.083	.083	.065	.07	.038	.063	.078
14.28*	13.88*	20.83*	12.98*	13.69*	12.04*	12.05*	15.38*	14.29*	26.31*	15.87*	12.82*
1.0			.92	.936	1.229	.50	.34	2.4	1.14	.87	1.06
3.0	2.75	4.0	4	4 1/4	4	4.0	4.5	4.5		2.8	2.5
.05	.062	.042	.067	.064	.072	.056	.058	.0625		.057	.068
16.66*	16.12*	26.19*	14.92*	15.62*	13.88*	17.86*	17.24*	16.00*		17.54*	14.70*
1.1			.96	.978	1.271	.60	.35	2.5		.92	1.10
			100 100 100	100 100 100	100 100 100	99 97 95				90	90
ICBO 3292					P 801 P 803 P 814 P 815						
See Appendix										See Appendix	See Appendix

Composite
Roof Board Insulation
Products listed by alphabetic company name.

1. Company	Poly Fab Ind., Inc.	Rmax, Inc	Sequoyah Foam, Inc.	Therma Foam, Inc	Therma Foam, Inc	Therma Foam, Inc	Therma Foam, Inc	Thermal Foams, Inc.	Thermal Systems, Inc
2. State	MN	TX	OK	TX	TX	TX	TX	NY	UT
3. Product Trade Name	Lithane Comp	Thermaroof Composite							Composite Roof Insl
4. Composite Components:									
4.1 Expanded Polystyrene			X	X	X	X	X	X	
4.2 Extruded Polystyrene									
4.3 Polyurethane									X
4.4 Polyisocyanurate		X							X
4.5 Perlite		X	X	X			X		
4.6 Gypsum Board					X			X	
4.7 Fiber Board						X			
4.8 Plywood									
4.9 Other									
4.10 Other									
5. Surface Treatment:									
5.1 Asphalt Roofing Felt		X							X
5.2 Foil Facer				X			X		
5.3 Kraft Facer									
5.4 Other									
5.5 Other									
6. Available as Tapered Material		NO		YES	YES	YES	YES	NO	
7. Year First Used in Commercial Roofing Systems			1981	1979	1979	1979	1979	1981	1982
8. Common Available Sizes (Contact mfr. for other sizes and special orders)									
8.1 2′x4′			X					X	
8.2 3′x4′									
8.3 4′x4′		X			X		X	X	X
8.4 4′x8′				X	X	X	X	X	X
8.5 Other									
8.6 Other									
9. Common Available Thicknesses (Contact mfr. for other thicknesses), (C) Values, (R) Values, Weight/ft²									
9.1 Thickness; in inches	2.8	1.50	2 1/2	3 1/8	3 1/2	3	3 3/4	1 1/2	1.5
Thermal Conductance (C) @ 75°F	.060	.147	1.0	.097	.08	.097	.072	.193	.127
Thermal Resistance (R) @ 75°F	16.66*	6.80*		10.30*	12.50*	10.30*	13.88*	5.18*	7.87*
Weight; lbs/ft²	1.15	1.0	.9	2.6	.94	1.5	.6	.91	.95
9.2 Thickness; in inches	3	2.0	4 1/2	4 1/8	4 1/2	4	4 3/4	2	2.0
Thermal Conductance (C) @ 75°F	.054	.101	.06	.070	.06	.070	.056	.141	.086
Thermal Resistance (R) @ 75°F	18.51*	9.90*	16.66*	14.28*	16.66*	14.28*	17.85*	7.09*	11.62*
Weight; lbs/ft²	1.19	1.1	1.1	2.6	.94	1.5	.6	.95	1.03
9.3 Thickness; in inches	3.3	2.25	6 1/2	5 1/8	5 1/2	5	5 3/4	2 1/2	2.5
Thermal Conductance (C) @ 75°F	.050	.087	.04	.055	.05	.055	.046	.11	.064
Thermal Resistance (R) @ 75°F	20.00*	11.49*	25.00*	18.18*	20.00*	18.18*	21.73*	9.09*	15.62*
Weight; lbs/ft²	1.28	1.1	1.3	2.6	.94	1.5	.6	.99	1.11
9.4 Thickness; in inches	3.5	2.50	8 1/2					3	3.0
Thermal Conductance (C) @ 75°F	.045	.077	.03					.091	.052
Thermal Resistance (R) @ 75°F	22.22*	12.98*	33.33*					10.98*	19.23*
Weight; lbs/ft²	1.28	1.2	1.4					1.03*	1.2
9.5 Thickness; in inches	3.8	2.75						3 1/2	3.5
Thermal Conductance (C) @ 75°F	.042	.068						.077	.043
Thermal Resistance (R) @ 75°F	23.80*	14.70*						12.98*	23.25*
Weight; lbs/ft²	1.34	1.2						1.07	1.28
9.6 Thickness; in inches	4	3.0						4	4.0
Thermal Conductance (C) @ 75°F	.039	.062						.067	.037
Thermal Resistance (R) @ 75°F	25.64*	16.12*						14.92*	27.02*
Weight; lbs/ft²	1.37	1.2						1.11	1.36
10. Estimated % of Thermal Value Retention @ 1 year		99	100	100	100	100	100	80	99
(Assuming a continuous mean temperature 5 years		95	100	100	100	100	100	80	87
differential & constant moisture content) 10 years		95	100	100	100	100	100	80	96
11. UL "P" Design Numbers; Building Code Agency Approval Numbers; ICBO, BOCA, SBCCI (Others)			ICBO 3401					ICBO 4169	
12. Limitations and/or Restrictions								See Appendix	See Appendix

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* = A calculated figure. (C) calculated from reported (R) or (R) calculated from reported (C).

Note 1: FM Windstorm and Fire Ratings are often important when considering the selection of a roofing insulation material. To determine the availability of a rating and approved attachment methods for various materials, refer to specific listings published in the FM Approval Guide.

Note 2: NA = Not available; N/A = Not applicable.

Composite
Roof Board Insulation
Products listed by alphabetic company name.

Win Tec Inc.	Win Tec Inc.										
IL	IL										
Ruk Board Plus	Ruk Board Super Plus										
X	X										
X	X										
X	X										
X	X										
1982	1984										
X											
X											
1.5	1.5										
.147	.13										
6.80*	7.69*										
.90	.87										
1.8	1.8										
.12	.10										
8.33*	10.00*										
.92	.92										
2.0	2.1										
.10	.08										
10.00*	12.50*										
.96	.97										
2.4	2.3										
.080	.07										
12.50*	14.28*										
1.03	1.00										
3.3	3.0										
.050	.05										
20.00*	20.00*										
1.19	1.12										
4.0	4.0										
.040	.037										
25.00*	27.02*										
1.32	1.28										
80	80										
80	80										
80	80										
See Appendix	See Appendix										

APPENDIX: Roof Board Insulation

1. APACHE BUILDING PRODUCTS COMPANY
WHITE LINE PYROX AND PYROX-PLUS

Building Codes: NYC Board of Standard and Appeals CAL No 915 66 SM; Metro Dade County, Florida #83, 0415.6; City and County of Denver #M-82-148-A White Line; #M-73-73 Millox, ICBO # 3026.

Limitations and Restrictions: Cold Weather Application - Installation of built-up roofing at ambient temperatures below 40 degrees F requires special precautions to insure proper performance of the insulation and roofing system. REMOVE ALL MOISTURE (INCLUDING ICE AND SNOW) FROM THE DECK PRIOR TO APPLYING INSULATION. Where bitumen is used to attach insulation, do not overheat bitumen to offset rapid cooling and apply insulation and roofing close behind the mop.

New Roofing and Reroofing - APACHE'S White Line insulations are well suited for all new roofing and most reroofing applications. Reroofing with an APACHE insulation over an existing roof requires the removal of any and all surface irregularities. If insulation is attached with asphalt, a sufficient amount should be used to cover the top of any remaining aggregate to INSURE COMPLETE BOARD ADHERENCE.

Graveled and Smooth Surface Roofing - APACHE recommends that our insulations be used under gravel surfaced built-up roofing systems. APACHE must be consulted prior to application of our products in any smooth surfaced built-up roofing systems.

WARNING - These products will decompose and/or burn if exposed to sufficient heat or an ignition source of sufficient intensity. They should not be used in exposed or inadequately protected applications. They should be installed according to APACHE specifications.

Limitations - Characteristics, properties, performance of materials and application specifications herein described are based on data obtained under controlled conditions.

APACHE makes no warranties, expressed or implied, as to the characteristics, properties or performance of its product under any variations from such conditions. APACHE assumes no responsibility for the effects of structural movement and makes no implied warranties whatsoever. No agent, salesman, representative or employee is empowered to change, alter or amend this provision, unless it is done in writing by a duly authorized officer or employee of APACHE.

Moisture Protection - Apache insulation, like all insulations, must be kept dry in order to function properly. All phases of storage, transportation, handling and installation must be governed by this requirement. Apache insulation must be protected from weather and standing water at all times. Apply no more insulation in a day than can be covered by the membrane system. Temporary water cut-off shall be installed to protect applied insulation when suspending application. Remove cut offs before continuing application.

Insulation Stops and Nailers - Wood insulation stops shall be 6" wide by thickness of insulation, treated with preservative and securely fastened to the deck at all edges and eaves. On all decks with slopes over 1" per foot wood nailers shall be used. Nailers shall be preservative treated and equivalent in thickness to the insulation. They shall be securely fastened to the deck parallel to the low point of the roof. With slopes under 3" per foot, nailers shall be spaced 20 feet maximum. With slopes over 3" per foot, nailers shall be spaced 4 feet maximum.

Mechanical Fasteners - APACHE strongly recommends the use of FM approved fasteners in securing insulation boards to the deck. Fasteners are to be installed in accordance with the fastener manufacturer's instructions and FM approved nailing patterns under built up roofing and single ply membrane systems. Factory Mutual typically requires one fastener for every three square feet of Apache insulation in built up roofing and one fastener for every two square feet of Apache insulation under fully adhered single ply membranes. Mechanically attached single ply systems may require one fastener every four square feet.

These products should not be used in torch applied systems directly beneath the membranes. Apply a base sheet on top of the insulation and torch apply the membrane to the base sheet.

2. ASSOCIATED FOAM MANUFACTURERS
CONTOUR TAPER TILE X

FOAMULAR INSULATION is practical for building roofs having normal roof temperature conditions but should not be used in contact with chimneys, heater vents, steam pipes, or other surfaces where temperatures exceed 150 degrees F. It is not recommended for unballasted applications where sustained roof temperatures exceed 165 degrees F. and intermittent temperatures exceed 180 degrees F.

FOAMULAR INSULATION is recommended essentially for flat roofs. Slope limitations are dependent upon details of the system to be used. Consult the system supplier/installer.

FOAMULAR INSULATION is not recommended directly over steel roof decks.

Plastic or oil-base roof cements, asphalt or coal tar pitch are not recommended with FOAMULAR INSULATION.

3. ASSOCIATED FOAM MANUFACTURERS
CONTOUR TAPER TILE X

FOAMULAR INSULATION is practical for building roofs having normal roof temperature conditions but should not be used in contact with chimneys, heater vents, steam pipes, or other surfaces where temperatures exceed 150 degrees F. It is not recommended for unballasted applications where sustained roof temperatures exceed 165 degrees F. and intermittent temperatures exceed 180 degrees F.

FOAMULAR INSULATION is recommended essentially for flat roofs. Slope limitations are dependent upon details of the system to be used. Consult the system supplier/installer.

FOAMULAR INSULATION is not recommended directly over steel roof decks.

Plastic or oil-base roof cements, asphalt or coal tar pitch are not recommended with FOAMULAR INSULATION.

4. ASSOCIATED FOAM MANUFACTURERS, INC.
CONTOUR TAPER TILE SYSTEM

Please follow recommended installation guidelines contained in AFM CONTOUR TAPER TILE Spec-Data Form.

5. CARLISLE SYNTEC SYSTEMS
SURE-SEAL EPS INSULATION

SURE-SEAL EPS Foam must be protected from:
a. Temperatures > 160 degrees F.
b. Oil, solvents, and other aliphatic or hydrocarbon substances which could degrade the Foam.
When used over coal tar roof membranes, the following procedures apply:
A. The coal tar membrane to be covered must have been exposed in field surface environment for at least five years.
B. A minimum one-half inch butt-joined wood fiberboard separation barrier (joints taped securely) is installed prior to laying of the EPS.

C. The system design temperature does not exceed 130 degrees F. at the coal tar membrane/wood fiberboard interface.

Protect from sunlight during storage.

Review the Carlisle EPS Material Safety Data Sheet for complete safety information prior to use.

The Carlisle EPS Insulation is not to be installed in hot asphalt.

6. CELOTEX CORPORATION, THE
THERMAX HY-TEC ROOF INSULATION

Building Codes: ICBO 1712; BOCA 1317.0; SBCCI 717; CGSB provisional standard 51-GP-26M.

Limitations and/or Restrictions; This product should only be used in strict accordance with Celotex recommended uses and application instructions.

7. CELOTEX CORPORATION, THE
CELO-THERM PERLITE ROOF INSULATION

This product should only be used in strict accordance with Celotex recommended uses and application instructions.

8. CELOTEX CORPORATION, THE
FIBERBOARD ROOF INSULATION

This product should only be used in strict accordance with Celotex recommended uses and application instructions.

9. CORNELL CORPORATION
THERMACAL

THERMACAL is a nail base roof insulation consisting of urethane and waferboard. It is not designed as a roof deck and should be installed over a proper structural deck. It is often used over wood roof decks and forms a nailable surface for the attachment of shingles, shakes, and other fastener applied roofs. See manufacturer's literature for additional information.

10. DOW CHEMICAL, USA
STYROFOAM PD BRAND INSULATION

UL Design Numbers: P708, P225, P226, P229, P235, P248, P404, P505, P507, P701, P801, P803, P805, P811, P813, P902, P904, P908, P909, P912, P915

Building Codes: ICBO 2257, SBCCI 8183

Limitations and/or Restrictions: STRYOFOAM PD BRAND INSULATION is intended for use above waterproofing membranes in plaza and parking deck construction and in other areas where high compressive strength insulation is required.

STYROFOAM BRAND INSULATION has poor resistance to aromatic hydrocarbons, chlorinated hydrocarbons, olefins, napthas, ketones, gasolines, fuel oil and oil-based paint.

MAXIMUM SERVICE TEMPERATURE: 165 degrees F.

WARNING
STYROFOAM BRAND INSULATION is combustible and may constitute a fire hazard if improperly used or installed. It should be adequately protected. Use only as directed by the specific instructions for this product. It contains a flame retardant additive to inhibit accidental ignition from small fire sources. During shipping, storage, installation and use, this material should not be exposed to flame or other ignition sources.

SPECIAL INSTRUCTIONS
All roof deck systems incorporating STYROFOAM BRAND INSULATION should provide an adequate fire barrier. For proper protection of stored insulation, consult the National Fire Protection Association (NFPA) standards or the authority having jurisdiction.

LIGHT STABILITY: STYROFOAM BRAND INSULATION should be shielded from sunlight when stored outdoors for extended periods. Cover with a light-colored, opaque tarp for protection from solar radiation.

11. DOW CHEMICAL, USA
STYROFOAM SM BRAND INSULATION

Building Codes: ICBO 2257, BOCA 80-72, SBCCI 8183

Limitations and/or Restrictions: STYROFOAM SM is intended for use beneath loose-laid ballasted or mechanically attached sheet membranes.

MAXIMUM SERVICE TEMPERATURE: 165 degrees F.

STYROFOAM SM has poor resistance to aromatic hydrocarbons, chlorinated hydrocarbons, olefins, napthas, ketones, gasolines, fuel oil, oil based paint, and plasticizers found in some sheet membranes.

WARNING
STYROFOAM BRAND INSULATION is combustible and may constitute a fire hazard if improperly used or installed. It should be adequately protected. Use only as directed by the specific instructions for this product. It contains a flame retardant additive to inhibit accidental ignition from small fire sources. During shipping, storage, installation and use, this material should not be exposed to flame or other ignition sources.

SPECIAL INSTRUCTIONS
All roof deck systems incorporating STYROFOAM BRAND INSULATION should provide an adequate fire barrier for XFS-43393.00. For proper protection of stored insulation, consult the National Fire Protection Association (NFPA) standards or the authority having jurisdiction.

LIGHT STABILITY: STYROFOAM BRAND INSULATION should be shielded from sunlight when stored outdoors for extended periods. Cover with a light-colored, opaque tarp for protection from solar radiation.

12. DOW CHEMICAL, USE
STYROFOAM TG BRAND INSULATION

Building Codes: ICBO 2257, BOCA 80-72, SBCCI 8183

Limitations and/or Restrictions: STYROFOAM TG is intended for use beneath loose-laid ballasted or mechanically attached sheet membranes.

MAXIMUM SERVICE TEMPERATURE: 165 degrees F.

STYROFOAM TG has poor resistance to aromatic hydrocarbons, chlorinated hydrocarbons, olefins, napthas, ketones, gasolines, fuel oil, oil-based paint and plasticizers found in some sheet membranes.

WARNING
STYROFOAM BRAND INSULATION is combustible and may constitute a fire hazard if improperly used or installed. It should be adequately protected. Use only as directed by the specific instructions for this product. It contains a flame retardant additive to inhibit accidental ignition from small fire sources. During shipping, storage, installation and use, this material should not be exposed to flame or other ignition sources.

SPECIAL INSTRUCTIONS
All roof deck systems incorporating STYROFOAM BRAND INSULATION should provide an adequate fire barrier. For proper protection of stored insulation, consult the National Fire Protection Association (NFPA) standards or the authority having jurisdiction.

LIGHT STABILITY: STYROFOAM BRAND INSULATION should be shielded from sunlight when stored outdoors for extended periods. Cover with a light-colored, opaque tarp for protection from solar radiation.

13. DOW CHEMICAL, USA
STYROFOAM LIGHTGUARD BRAND INSULATION

UL Desing Number: P708, P225, P226, P229, P235, P248, P404, P505, P507, P701, P801, P803, P805, P811, P813, P902, P904, P908, P909, P912, P915

Limitations and/or Restrictions: STYROFOAM LIGHTGUARD BRAND INSULATION is intended for use above waterproofing membranes in Insulated Roof Membrane Assemblies (IRMA).

STYROFOAM BRAND INSULATION has poor resistance to aromatic hydrocarbons, chlorinated hydrocarbons, olefins, napthas, ketones, gasolines, fuel oil, and oil-based paint.

Maximum service temperature: 165 degrees F.

WARNING

STYROFOAM BRAND INSULATION is combustible and may constitute a fire hazard if improperly used or installed. It should be adequately protected. Use only as directed by the specific instruction for this product. It contains flame retardant additive to inhibit accidental ignition from small fire sources. During shipping, storage, installation and use, this material should not be exposed to flame or other ignition sources.

SPECIAL INSTRUCTIONS
All roof deck systems incorporating STYROFOAM BRAND INSULATION should provide an adequate fire barrier. For proper protection of stored insulation, consult the National Fire Protection Association (NFPA) standards or the authority having jurisdiction.

LIGHT STABILITY: STYROFOAM BRAND INSULATION should be shielded from sunlight when stored outdoors for extended periods. Cover with a light-colored opaque tarp for protection from solar radiation.

Dow specifications require the roofing assembly be designed to prevent air penetration under the membrane. Any bellowing of the membrane voids the Dow warranty.

STYROFOAM LIGHTGUARD is designed as a roof insulation, not as a plaza deck. Although the concrete surface is suitable for most foot traffic (excluding hard wheeled carts) it is not a satisfactory surface for general pedestrian traffic or plaza use.

14. EPS MOLDING, INC.
CONTOUR PROTECTED BOARD

FOAMULAR 404 INSULATION is practical for building roofs having typical roof temperatures, but should not be used in contact with chimneys, heater vents, steam pipes, or other surfaces where temperatures exceed 150 degrees F.

To ensure adequate drainage, sufficient to drain roof completely within 48 hours after a rain, 1/4:12 minimum slope of roof membrane is recommended.

Roof decks over which FOAMULAR 404 INSULATION is installed should provide an adequate fire barrier as required by the building codes.

WARNING: Combustible FOAMULAR 404 POLYSTYRENE INSULATION will ignite if exposed to fire of sufficient heat and intensity, although it does contain a flame-retardant additive to inhibit ignition from small fire sources. This

product should be installed only above a thermal barrier system acceptable to the building codes. For example, 5/8" thick gypsum board or 1" thick perlite concrete beneath the insulation (on the roof-deck side), is often acceptable. During shipping and storage, installation and use, this product should not be exposed to open flames or ignition sources.

15. E.P.S. MOLDING, INC.
CONTOUR TAPER TILE X

FOAMULAR INSULATION is practical for building roofs having normal roof temperature conditions but should not be used in contact with chimneys, heater vents, steam pipes, or other surfaces where temperatures exceed 150 degrees F. It is not recommended for unballasted applications where sustained roof temperatures exceed 165 degrees F. and intermittent temperatures exceed 180 degrees F.

FOAMULAR INSULATION is recommended essentially for flat roofs. Slope limitations are dependent upon details of the system to be used. Consult the system supplier/installer.

FOAMULAR INSULATION is not recommended directly over steel roof decks.

Plastic or oil-base roof cements, asphalt or coal tar pitch are not recommended with FOAMULAR INSULATION.

16. E.P.S. MOLDING, INC.
CONTOUR TAPER TILE X

FOAMULAR INSULATION is practical for building roofs having normal roof temperature conditions but should not be used in contact with chimneys, heater vents, steam pipes, or other surfaces where temperatures exceed 150 degrees F. It is not recommended for unballasted applications where sustained roof temperatures exceed 165 degrees F. and intermittent temperatures exceed 180 degrees F.

FOAMULAR INSULATION is recommended essentially for flat roofs. Slope limitations are dependent upon details of the system to be used. Consult the system supplier/installer.

FOAMULAR INSULATION is not recommended directly over steel roof decks.

Plastic or oil-base roof cements, asphalt or coal tar pitch are not recommended with FOAMULAR INSULATION.

17. EPS MOLDING, INC.
LT. DECK BOARD

Light wt. concrete deck applicator should specify size and number of key/vent holes.

18. GAF CORPORATION
GAFTEMP ISOTHERM

GAFTEMP Isotherm roof insulation is a non-structural, non-loadbearing material. It is not designed for direct traffic usage unless adequately protected.

GAFTEMP Isotherm roof insulation should be stored dry and protected from the elements. No more insulation should be installed than can be completely covered with roofing on the same day. As unprotected urethane will burn, fire safety precautions should be observed wherever any urethane products are used.

GAFTEMP Isotherm is a non-composite insulation board made up of asphalt impregnated glass mat facers bonded to a core of isocyanurate foam.

19. GAF CORPORATION
GAFTEMP PERLITE

UL Design Numbers: P001, P004, P206, P210, P211, P221, P225, P230, P232, P233, P237, P238, P243, P502, P508, P510, P701, P708, P801, P803, P805, P810, P814, P904, P909, P912, P915

Limitations and/or Restrictions: GAFTEMP Perlite roof insulation should nt be left exposed to the weather. No more insulation should be applied than can be completely covered with the finished roofing on the same day.

20. GAF CORPORATION
GAFTEMP Urethane/Perlite

GAFTEMP Urethane/Perlite roof insulation is composite insulation board combining perlite board and urethane foam. An asphalt impregnated facer is used for the top surface. This product is specifically designed for application with urethane foam side up.

21. GAF CORPORATION
GAFTEMP URETHANE

GAFTEMP Urethane roof insulation is a non-structural, non-loadingbearing board. It is not designed for direct traffic usage unless adequately protected.

GAFTEMP Urethane roof insulation should be stored dry and protected from the elements. Nor more insulation should be installed than can be completely covered with finished Roofing on the same day. As an unprotected urethane will burn, fire safety precautions must be observed wherever it is used. Urethane products should not be used in contact with chimneys, heater vents, steam pipes or in other areas that could be subject to high service temperature. Urethane board stock should be stored and used in locations free from any ignition hazard.

22. GAF CORPORATION
GAFTEMP ISOTHERM/PERLITE

GAFTEMP ISOTHERN/PERLITE roof insulation is a composite insulation board combining perlite board and isocyanurate foam. Asphalt impregnated facer is used for the bottom surface. This product is specifically designed for applications where fire resistance is needed and the product can be installed with the perlite side up for applications requiring this configuration.

GAFTEMP ISOTHERM/PERLITE roof insulation is a non-structural, non-loadbearing material. It is not designed for direct traffic usage unless adequately protected.

GAFTEMP ISOTHERM/PERLITE roof insulation should be stored dry and protected from the elements. No more insulation should be installed than can be completely covered with roofing on the same day. As unprotected urethane will burn, fire safety precautions should be observed wherever urethane/perlite board or other urethane products are used.

23. HOMASOTE COMPANY
ULTRA/C-1 & ULTRA/M-II ISOLGLAS

Not to be used with torch system (modified bitumens) unless a separator sheet is mechanically applied over the ULTRA/C-1 & ULTRA/M-II ISOLGLAS before the modified bitumens are applied.

24. HOMASOTE COMPANY
ULTRA/M

Not compatible with hot bitumens, modified bitumens (torch systems).

25. HOMASOTE
N.C.F.R. THERMASOTE

Must be mechanically attached to roof deck.

26. HUEBERT FIBERBOARD, INC.
HFB INSULATION BOARD

Contact Huebert Fiberboard, Inc. for any information on limitations or restrictions.

27. INTERNATIONAL PERMALITE, INC.
PERMALITE ISO-LITE

PERMALITE ISO-LITE is not structural in nature. It should be stored dry and not exposed to the elements. No more insulation should be installed than can be "dried in" the same day. Good fire safety precautions must be observed wherever ISO-LITE is used. ISO-LITE should be stored and used in a location free from any ignition hazard. The top surface of Permalite ISO-LITE should not be subjected to the application of hot bitumen in excess of 450 degrees F.

28. INTERNATIONAL PERMALITE, INC.
PERMALITE ISO-THANE

PERMALITE ISO-THANE is not structural in nature. It should not be left exposed to the elements. No more insulation should be installed than can be completely protected in the same day. Good fire safety precautions must be observed wherever ISO-THANE is used. ISO-THANE should be stored and used in a location free from ignition hazard. ISO-THANE should not be subjected to applications of hot bitumens in excess of 450 degrees F.

29. INTERNATIONAL PERMALITE, INC.
PERMALITE SEALSKIN

UL Design Numbers: P001, P004, P201, P202, P203, P204, P206, P210, P211, P221, P224, P225, P230, P232, P233, P237, P238, P243, P252, P404, P502, P508, P510, P701, P703, P708, P710, P801, P803, P805, P810, P814, P815, P904, P909, P912, P915, 5701, 5702.

Building Codes: ICBO 3549, BOCA 83-36, SBCCI 8392

Limitations and/or Restrictions: PERMALITE SEALSKIN is not structural in nature. It should not be left exposed to the elements. No more insulation should be applied than can be completely protected in the same day. SEALSKIN should be protected from rooftop traffic. SEALSKIN is not acceptable for applications where it shall be exposed to direct interface with continuous soaking temperatures in excess of 250 degrees F.

30. KOPPERS COMPANY, INC.
EXELTHERM XTRA

UL Design Numbers: P120, P123

Building Codes: ICBO 4086, BOCA 82-95, SBCCI 8370, NYC MEA #(S) 35-78M thru 40-78M, VOL. II & 126 & 127-81-M WOL. II; State of Ohio; City of Los Angeles, California State Fire Marshall; City of San Francisco; Dade County; Florida; City of Cleveland; State of Wisconsin.

Limitations and/or Restrictions: See manufacturer application instructions on Fact Sheet #OM-556 April 1984.

31. LUCAS SALES COMPANY, INC.
LUCAS LITE TAPERED EXTRUDED POLYSTYRENE

LUCAS LITE is practical for building roofs having normal roof temperature conditions, but should not be used in contact with chimneys, heat vents, steam pipes, or other surfaces where temperatures exceed 150 degrees F. It is not recommended for unballasted applications where sustained roof temperatures exceed 165 degrees F. intermittent

temperatures exceeding 180 degrees F.

LUCAS LITE is recommended for flat roofs ONLY (less than 2:12 slope)

LUCAS LITE is not to be applied with plastic, oil, or solvent based roof cements.

LUCAS LITE will provide slope on flat roof decks. Deflected areas or low spots should be filled to provide a relatively level deck for the new tapered system.

32. LUCAS SALES COMPANY
THE LUCAS TAPERED SYSTEM

UL Design Numbers: P001, P004, P201, P202, P203, P204, P205, P206, P210, P211, P221, P224, P225, P230, P232, P233, P237, P238, P243, P252, P404

Building Codes: ICBO 3549, BOCA 8336, SBCCI 80108

Limitations and/or Restrictions: LUCAS TAPERED SYSTEM is not structural in nature; while highly moisture resistant, it should not be left exposed to the elements. Therefore, no more insulation should be applied than can be completely protected the same day.

LUCAS TAPERED SYSTEM is not designed for direct traffic unless appropriately protected.

LUCAS TAPERED SYSTEM is not acceptable for applications where it shall be exposed to direct interface with continuous soaking temperatures of 250 degrees F.

LUCAS TAPERED SYSTEM will provide slope on flat roof decks. Deflected areas or low spots should be filled to provide a relatively level deck for new tapered roof insulation system.

When applying directly over metal decks, 3/4" thickness at low points is recommended as a minimum. Check flute span requirements for specific minimum thickness requirements.

33. MANVILLE BUILDING MATERIALS CORP.
ULTRA GARD SP

Not for use in applications with continuous operating

34. MANVILLE BUILDING MATERIALS CORP.
ULTRA GARD

Not for use in applications with continuous operating temperatures greater than 200 degrees F. Product is designed for BUR usage.

35. MANVILLE BLDG MAT'LS CORP
1/2" RETRO-FIT BOARD

Not for use in applications with continuous temperatures greater than 200 degrees F.

36. MANVILLE BLDG MAT'LS CORP
ULTRA THANE SP

Not for use where continuous operating temperatures are greater than 200 degrees F.

Facers may not be compatible with hot asphalt.

37. MANVILLE BLDG MAT'LS CORP
ULTRA THANE

Not for use in applications with continuous operating temperatures greater than 200 degrees F.

Facer may not be compatible with some single ply bonding cements and single ply materials.

38. NRG BARRIERS, INC.
ENRGY - 1

NRG Insulations must be kept dry before, during, and after application. Proper protection from the elements is required at all times. Do not expose to open flame at any time. Do not use in exposed applications. Do not hot mop fiberglass facers over 425 degrees F. Do not hot mop foil facers at all. Consult current NRG Barriers, Inc. literature for specifications and application instructions.

39. OWENS-CORNING FIBERGLAS
OCFOAM ROOF INSULATION

Owens-Corning supports the NRCA/TIMA recommendation to reduce potential blisters over urethane foam, either by an additional layer of Fiberglas roof insulation, or a venting base sheet be applied prior to applying the membrane.

Mopping asphalt should be 425 at point of application.

Gravel surface treatments, when used, should be within 30 days of installation.

40. OWENS-CORNING FIBERGLAS CORP.
OWENS-CORNING WOOD FIBER ROOF INSULATION

All wood fiber insulation may warp or buckle when exposed to moisture and sun. It must not be installed over a wet existing roof. Boards larger than 2' x 4' should be installed with a 1/16" - 1/8" gap at all joints.

A vapor retarder should be used between any roof insulation and deck where indoor temperature and humidity can create a condensation problem.

41. OWENS-CORNING FIBERGLAS
FIBERGLAS ROOF INSULATION

UL Design Numbers: P213, P214, P224, P225, P228, P233, P240, P242, P245, P247, P409, P501, P504, P506, P508, P510, P512, P708, P711, P810, P816, P904, P909, P912, P915

Fiberglas roof insulation is not intended for use as a structural roof deck, for use under traffic deck surfaces 250 degrees F. or over.

Per accepted good roofing practices, a vapor retarder should be used between any roof insulation and deck where indoor temperature and humidity can create a condensation problem.

The manufacturers of single ply and fluid roofing systems should be consulted for appropriate recommendations for use of their materials over FIBERGLAS ROOF INSULATION.

42. PERMA "R" PRODUCTS, INC.
PERMA "R"

Do not mop hot asphalt directly to EPS.

43. POLY FAB INDUSTRIES, INC.
LITHANE X

Applicable Standards: HHI1972/2 & 1, HHI530 A-B, ASTM D1621, C209, C355, C518, E-84.

Limitations and Restrictions: Mechanical fasteners are to be used in numbers and patterns approved by Factory Mutual for I-90 wind uplift.

44. POLY FAB INDUSTRIES, INC.
LITHANE M

Applicable Standards: HHI 1972/1, HHI530 A-B, ASTM D1621, C209, C355, C518, E-84

Limitations and Restrictions: LITHANE M is not to be attached to the underlayment or deck using hot asphalt securement. Mechanical fasteners are to be used in numbers and patterns approved by Factory Mutual for I-90 wind uplift. Single layers below 1.4" have not been tested for I-60 or I-90 wind uplift.

45. POLY FAB INDUSTRIES, INC.
LITHANE BUR

Applicable Standards: HHI 1972/2, HHI530 A-B, ASTM D1621, C209, C355, C518, E-84

Limitations and Restrictions: Mechanical fasteners are to be used in numbers and patterns approved by Factory Mutual for I-90 wind uplift.

46. RMAX, INC.
PLY-1

Not for use with hot bitumens. Attachment to roof deck with only FM approved mechancial fasteners. See FM Approval Guide for limitations.

47. RMAX, INC.
THERMAROOF PLUS

Limited to use under ballasted single-ply (loose-laid) and mechanically attached single-ply membranes. Not for fully-adhered single-ply systems. Not for use with hot bitumens. Bahen - attached type single-ply systems require four (4) mechanical fasteners per 4' x 8' board prior to installing membrane.

48. RMAX, INC.
THERMAROOF STANDARD

Limited to use over non-combustible roof decks only without base layer of gypsum board or perlite.

49. TEMPLE-EASTEX, INC.
TEMPRO BASIC

Compatible for BUR and most types of single ply membranes, without the use of a slipsheet.

Can be attached to the deck by full hot mop; loose laid, ballasted; fully adhered; or mechanically attached systems. Consult the membrane manufacturer for the recommended adhesive or fastener type, and application rate.

Compatible with most deck types.

Storage: This product must be kept dry at all times, while in storage and during application of the roof.

Install only as much roof insulation in one day as can be covered by the completed membrane in the same day.

WARNING:
TEMPRO BASIC is an organic insulation, and will burn if exposed to an ignition source of sufficient heat and intensity. This product should not be installed in exposed applications.

Note: R-Values are determined by using the ASTM C-518 test method conducted at 75 degrees F. mean temperature on material that has been aged for at least 6 months. The thermal value of this product was determined in accordance with the TIMA conditioning procedure as outlined in RIC/TIMA Technical Bulletin 281-1.

50. TEMPLE-EASTEX, INC.
TEMPRO STANDARD

FM approved over steel and concrete decks for certain single ply and BUR applications, as detailed in the FM Approval Guide and the FM reports.

Underwriters Laboratories, Inc. Class A Roof Component.

Compatible for BUR and most types of single ply membranes without the use of a slipsheet.

Can be attached to the deck by full hot mop; loose laid ballasted; fully adhered; or mechanically attached systems. Consult the membrane manufacturer for the recommended adhesive or fastener type and application rate. Consult the FM report for Factory Mutual requirements and applications.

Compatible with most deck types.

Storage: This product must be kept dry at all times, while in storage and during application of the roof.

Install only as much roof insulation in one day as can be covered by the completed membrane in the same day.

Warning: TEMPRO STANDARD is an organic insulation and will burn if exposed to an ignition source of sufficient heat and intensity. This product should not be installed in exposed applications.
Consult the Temple Eastex Application Instructions for other details.

Note: R-Values are determined by using the ASTM C-518 test method conducted at 75 degrees F. mean temperature on material that has been aged for a least 6 months. The thermal value of this product was determined in accordance with the TIMA conditioning procedure as outlined in RIC/TIMA Technical Bulletin 281-1.

51. TEMPLE-EASTEX, INC.
TEMPRO S.P.

FM approved over steel deck for certain single-ply applications; as detailed in the FM approval guide and the FM report.

Underwriters Laboratories, Inc. Class A Roof Consultant.

Compatible for use with most types of single ply membranes without the use of a slipsheet. For BUR applications, use TEMPRO or TEMPRO STANDARD roof insulation.

Can be attached to the deck in loose laid ballasted, fully adhered, or mechanically attached systems. Consult the membrane manufacturer for the recommended adhesive or fastener type, and application rate. Consult the FM report for Factory Mutal requirements and applications.

Compatible with most deck types.

Storage: This product must be kept dry at all times, while in storage and during application of the roof.

Install only as much roof insulation in one day as can be covered by the completed membrane in the same day.

Warning: TEMPRO S.P. is an organic insulation, and will burn if exposed to an ignition source of sufficient heat and intensity. This product should not be installed in exposed applications.
Consult the Temple-Eastex Applications Instructions for further details.

Note: R-Values are determined by using the ASTM C-518 test method conducted at 75 mean temperature on material that has been aged for at least 6 months. The thermal value of this product was determined in accordance with the TIMA conditioning procedure as outlined in RIC/TIMA Technical Bulletin 281-1.

52. THERMAL SYSTEMS, INC.
STANDARD ROOF INSULATION

Thermal Systems' roof insulation products are non-structural, non-load bearing materials. They are not designed for direct traffic usage unless adequately protected. All roof insulation should be kept dry and protected from the elements. Asphalt mopping temperature must not exceed 450 degrees F. No more insulation should be installed than can be covered in the same day. Isocyanurate foam will burn if exposed to a flame of sufficient heat and intensity.

Contact Thermal Systems for advice on the use of these products if there is any doubt concerning the proper product for the job, the proper installation procedure or the proper code approvals.

53. THERMAL SYSTEMS, INC.
THERMALGLAS

Thermal Systems roof insulation products are non-structural, non-load bearing materials. They are not designed for direct traffic usage unless adequately protected. All roof insulation should be kept dry and protected from the elements. Asphalt mopping temperature must not exceed 450 . No more insulation should be installed than can be covered in the same day. Isocyanurate foam will burn if exposed to a flame of sufficient heat and intensity.

Contact Thermal Systems for advice on the use of these
products if there is any doubt concerning the proper product for the job, the proper installation procedure or the proper code approvals.

54. THERMAL SYSTEMS, INC.
CONOISITE ROOF INSULATION

Thermal System's roof insulation products are non-structural, non-load bearing materials. They are not designed for direct traffic usage unless adequately protected. All roof insulation should be kept dry and protected from the elements. Asphalt mopping temperature must not exceed 450 degrees F. No more insulation should be installed than can be covered in the same day. Isocyanurate foam will burn if exposed to a flame of sufficient heat and intensity.

Contact Thermal Systems for advice on the use of these products if there is any doubt concerning the proper product for the job, the proper installation procedure or the proper code approvals.

55. U.C. INDUSTRIES
FOAMULAR 250 UL Const. 200, Class A

Product should not be used in contact with chimneys, heater vents, steam pipes, or other surfaces where temperatures exceed 150 degrees F.

Product should be installed under a membrane applied to a substrate having an adequate fire barrier as required by building codes, if over metal or combustible deck.

Separator sheet should be used where insulation may come in contact with PVC membrane or newer coal tar pitch membranes.

Any material containing volatile or extractable solvents should not be used in contact with polystyrene insulations.

56. U.C. INDUSTRIES
FOAMULAR 404

UL Design Numbers P225, P226, P229, P235, P248, P404, P505, P507, P701, P801, P803, P805, P811, P813, P902, P908, P909, P912, P915.

Product should not be used in contact with chimneys, heater vents, steam pipes, or other surfaces where temperatures exceed 150 degrees F.

Product should be installed over a membrane applied to a substrate having an adequate fire barrier as required by building codes, if over metal or combustible deck.

Separator sheet should be used where insulation may come in contact with PVC membrane or newer coal tar pitch roofing membranes.

Any material containing volatile or extractable solvents should not be used in contact with polystyrene insulations.

57. U.C. INDUSTRIES
FOAMULAR 150

Product should not be used in contact with chimneys, heater vents, steam pipes, or other surfaces where temperatures exceed 150 degrees F.

Product should be installed under a membrane applied to a substrate having an adequate fire barrier as required by building codes, if over metal or combustible deck.

Separator sheet should be used where insulation may come in contact with PVC membrane or coal tar pitch roofing membranes.

Any material containing volatile or extractable solvents should not be used in contact with polystyrene insulations.

58. WIN-TEC, INC.
R-U-K BOARD GL-100

Roof insulation should be completely protected at all times while being delivered, stored, handled and installed to keep it dry and free from physical damage.

Installed insulation is not to be left exposed to the weather but covered and waterproofed as work progresses. Open ends of each day's work must be protected with temporary water cut-offs which shall be removed when work is resumed. Applied insulation must be protected against damage by roof traffic.

It is essential that insulation being applied is thoroughly dry. Do not apply this material if the deck is wet or the possibility of precipitation exists prior to covering of insulation.

Use thickness(es) of R-U-K BOARD GL-100 ROOF INSULATION indicated on drawings and conforming with flute spanability of deck being used. R-U-K BOARD GL-100 ROOF INSULATION shall be laid with the long joint continuous and at right angles to the direction of the ribs in the deck. All end joints shall be broken and shall occur over the flat deck between ribs. Bring boards into snug contact.

Install and secure the membrane to the roof deck in accordance with the approved procedures specified for the particular membrane in R-U-K BOARD MEMBRANE APPLICATION BULLETIN.

*Rigid Urethane must not be left exposed! Foam in interior applications must be protected with an approved thermal barrier or otherwise protected in accordance with local building code regulations.

59. WIN-TEC, INC.
R-U-K BOARD KFL/ISO

For use in loose-laid, ballasted single ply membrane systems over a steel roof deck.

Roof insulation should be completely protected at all times while being delivered, stored, handled and installed to keep it dry and free from physical damage. When stored outdoors, it should be stacked on pallets or dunnage at least four (4) inches above the ground level and covered with a suitable waterproof covering.

Installed insulation is not to be left exposed to the weather but covered and waterproofed as work progresses. Open ends of each day's work must be protected with temporary water cut-offs which shall be removed when work is resumed. Applied insulation must be protected against damage by roof traffic.

It is essential that insulation being applied is thoroughly dry. Do not apply this material when the deck is wet or the possibility of precipitation exists prior to covering of insulation.

Use thickness(es) of R-U-K BOARD KFL/ISO ROOF INSULATION indicated on drawings and conforming with flute spanability of deck being used. R-U-K BOARD KFL/ISO ROOF INSULATION shall be laid with the long joint continuous and at right angles to the direction of the ribs in the deck. All end joints shall be broken and shall occur over the flat deck between ribs. Bring boards into snug contact.

Install and secure the membrane to the roof deck in accordance with the approved procedures specified for the particular membrane in R-U-K BOARD MEMBRANE APPLICATION BULLETIN.

*Rigid Urethane must not be left exposed! Foam in interior applications must be protected with an approved thermal barrier or otherwise protected in accordance with local building code regulations.

60. WIN-TEC, INC.
R-U-K BOARD GF-100

Roof insulation should be completely protected at all times while being delivered, stored, handled and installed to keep it dry and free from physical damage.

Installed insulation is not to be left exposed to the weather but covered and waterproofed as work progresses. Open ends of each days work must be protected with temporary water cut-offs which shall be removed when work is resumed. Applied insulation must be protected against damage by roof traffic.

It is essential that insulation being applied is thoroughly dry. Do not apply this material if the deck is wet or the possibility of precipitation exists prior to covering of insulation. Do not apply this material when mopping asphalts exceed 450 degrees F.

Use thickness(es) of R-U-K BOARD GF-100 ROOF INSULATION indicated on drawings and conforming with flute spanability of deck being used. R-U-K BOARD GF-100 ROOF INSULATION shall be laid with the long joint continuous and at right angles to the direction of the ribs in the deck. All end joints shall be broken and shall occur over the flat deck between ribs. Bring boards into snug contact.

Mechanically secure insulation to deck with fasteners equal to fasteners as specified by FM. Clips should be driven through metal. Six clips should be driven into each 3´ x 4´ board.

If two layers of R-U-K BOARD GF-100 ROOFING INSULATION are required, the second layer should be laid parallel to the first with all joints between the first and second layer staggered. Both layers are then fastened mechanically in one operation.

Built-up Roofing should then be installed in accordance with the built-up roofing manufacturer´s specification.

*Rigid Urethane must not be left exposed! Foam in interior applications must be protected with an approved thermal barrier or otherwise protected in accordance with local building code regulations.

INFORMATION ABOUT ROOF BOARD INSULATION

I. Roof Board Insulation

Rigid roof board insulation materials are manufactured from a variety of base materials or chemical compounds and are typically categorized as being of either "homogeneous" or "composite" construction.

For purposes of the listings contained in the Guide the following definitions and generic classes are used:

A. Homogeneous Insulating Boards

Any prefabricated roof board insulation product which has one insulation layer component manufactured from any one of several base materials. Top and/or bottom surfaces may or may not be coated or impregnated with asphalt or other binders and/or covered with facer materials such as foils, organic felts, glass fibers, kraft paper, etc.

Generic Classes

A. Expanded polystyrene
B. Extruded Polystyrene
C. Glass Fiber/Mineral Fiber
D. Cellular Glass
E. Phenolic
F. Fiberboard
G. Perlite
H. Polyurethane
I. Polyisocyanurate
J. Other Homogeneous Materials

B. Composite Insulating Boards

Any prefabricated roof board insulation product which consists of multiple (more than one) layers of insulation(s) and/or a variety of other board materials (typically perlite, fiberboard, plywood, gypsum board, etc.) to form a unified bonded multilayer component. Top and/or bottom surfaces may or may not be coated or impregnated with asphalt or other binders and/or covered with facer materials such as foils, organic felts, glass fibers, kraft paper, etc.

II. Selection Criteria

The selection of the appropriate roof insulation materials for a specific building application should consider the use of the insulation component within the specific roofing system. Some considerations are: compatibility with other roofing system components, substrate, desired thermal barrier objectives, durability, resistance to climatic conditions, stability, installed weight, method of attachment, fire and wind resistance, life cycle cost, need for additional slope (drainage), warranties and cost. In materials whose properties are best suited to the specific project.

III. Thermal Values

Roof board insulation materials are often rated and described in manufacturers' literature to show heat transfer or resistance to heat flow. These properties are stated in terms of Thermal Conductance(k), Thermal Conductivity (C), Thermal Resistance (R) or Overall Coefficient of Thermal Transmission (U) for a complete ceiling - substrate - roofing membrane construction. An explanation and use of these terms can be found in The NRCA Roofing and Waterproofing Manual and The NRCA Energy Manual. Both publications may be purchased from the National Roofing Contractors Association.

IV. Material Standards

Several material standards have been developed for insulation board materials. These standards define a variety of physical properties which are not included in the Guide product listings. For current information on these standards, or other technical data, write the manufacturer, American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, PA 19103 or the Superintendent of Documents, U.S. Government Printing Office, Washington, DC, 20402.

V. Material (Product) Descriptions

A. Expanded Polystyrene (EPS)

Expanded (molded) EPS board is formed from a plastic (polystyrene) polymer supplied by several companies to many regional converters. The process includes molding into blocks, processing into sheets and applying (optional) facer materials.

The converted materials generally conforms to material specifications published by the Society of Plastic Industries (SPI). Some of these specifications with other calculated data, are shown in the following EPS Material Data Sheet, and may be used in conjunction with the individual product listings shown in the EPS section.

The following "Usage Notes" for expanded EPS material is reprinted from the Society of the Plastics Industry (SPI) "Roofing Design Ideas" brochure:

"Flammability.
Like many construction materials, EPS is combustible. It should not be exposed to flame or other ignition sources. Current model building code requirements should be met for adequate protection or separation from occupied areas.

"Solvent attack.
EPS is subject to attack by petroleum-based solvents and coal tar products. Care should be taken to prevent contact between EPS, these materials and their vapors.

"Ultraviolet degradation.
Prolonged exposure to sunlight will cause a slight discoloration and surface dusting of EPS insulation. Though the insulating properties will not be significantly affected unless exposure is so excessive that thickness is lost. EPS should be covered to prevent ultraviolet degradation if it is to be stored in the open for extended periods.

"Installation exposure
Following each day of application, all exposed roof insulation should be covered and temporarily sealed from moisture in accordance with good roofing practices. Insulation exposed to moisture should be replaced or thoroughly dried prior to application of roofing.

"Application temperatures.
In roof construction requiring hot asphalt, temperatures should not exceed 250 degrees F. at the time of direct application to insulation. Avoid contact between EPS and high temperature equipment, such as asphalt kettles and flame sealers.

"Vapor retarders.
Each roofing application should be studied to determine the need for a vapor retarder to control internal condensation. Some of the factors to be considered are geographic location, occupancy, humidity conditions, type of deck and ceiling, venting, and environmental control systems."

B. Extruded Polystyrene

Extruded polystyrene board is formed from a plastic (polystyrene) polymer. Closed cells are integrally formed within the insulation materials during the expansion process. The continuous extrusion process produces a tight and complete skin (free of open cells) to form on each side of the insulation board. Boards are expanded to a specific thickness during the manufacturing process.

C. Glass Fiber

Glass fiber roof board insulation is a rigid insulating material composed of fine glass fibers, which provide the insulating properties of the product. The glass fiber reinforced asphalt and kraft paper top surface of the insulation boards provides a tough, impact-resistant, mopping surface upon which the built-up roof system may be applied.

Glass fiber roof insulation will vent moisture vapor through the insulation boards. In the event of damage to the built-up roof, moisture vapor can be vented and free water can be pumped out of the roof system, thereby eliminating the need to remove the insulation should it become wet. Once the roof insulation has dried, its original thermal value is restored.

D. Cellular Glass

Cellular glass roof insulation is a rigid insulating material composed of heat-fused, closed glass cells. It is available in standard insulation board or block form and in special tapered blocks that provide drainage slope for roof decks.

E. Phenolic

Phenolic foam insulation board is a closed cell, rigid, thermo setting phenolic foam core material manufactured in various thicknesses. The current most popular product is a phenolic foam core of approximately 3.0 lbs/cubic ft density and is laminated to a corrrugated kraft foil laminate on the top surface and a felt bottom surface.

F. Fiberboard

Fiberboard insulation is a preformed, rigid, fibrous-felted homogeneous panel, composed principally of wood or cane fibers integrally treated with waterproofing binders.

G. Perlite

Perlitic roof board insulation is a rigid insulating material manufactured from expanded volcanic minerals combined with organic fibers and waterproofing binders. The top surface of perlitic roof insulation is generally treated to minimize bitumen absorption and to provide an intimate bond with built-up roofing materials.

H. Polyurethane

Polyurethane foam board insulation is produced from a urethane chemical base. It is manufactured in the form of rigid boards or cut bun stock. The polyurethane material is often sandwiched between asphalt saturated organic or inorganic felt facer sheets.

I. Polyisocyanurate

Polyisocyanurate foam board insulation is produced from a polyisocyanurate based chemical. The polyisocyanurate material is usually sandwiched .pa between asphalt saturated organic or inorganic felt facers sheets. Glass fiber reinforcement used in some foam cores provides additional fire resistance and greater dimensional stability.

The trade name roof board insulations listed in the Guide typically show (C), (R) thermal values and weight per square foot for various thicknesses and densities.

A summary of (C), (R) thermal values and weight per sqaure foot information is shown below. This data was calculated by averaging the values shown for the individual materials.

For expanded polystyrene, for which technical data is not shown for individual trade name products, information is shown in the following table. Much of this information was provided by the Society of the Plastics Industry as published in "Expanded Polystyrene Insulation - Roofing Design Ideas" copyrighted 1981.

Material Data Sheet
Expanded Polystyrene (EPS) Homogeneous Roof Board Insulation

		TYPICAL THICKNESSES[c]																							
		¾″			1″			2″			3″			4″			5″			6″					
		Thermal Values			Thermal Values			Thermal Values			Thermal Values			Thermal Values			Thermal Values			Thermal Values					
Density		C	R	lbs/ft²	C	R	lbs/ft²	C	R	lbs/ft²	C	R	lbs/ft²	C	R	lbs/ft²	C	R	lbs/ft²	C	R	lbs/ft²			
1.0 lbs/ft³	@40°F	.32	3.13	.063	.24[b]	4.17[b]	.083	.12[b]	8.3[b]	.166	.08[b]	12.50[b]	.249	.06[b]	16.6[b]	.332	.05[b]	20.8[b]	.415	.04[b]	25.00[b]	.498			
	@75°F	.346	2.89		.26[b]	3.85		.13	7.69		.087	11.49		.065	15.38		.052	19.23		.043	23.26				
1.25 lbs/ft³	@40°F	.313	3.19	.078	.235[b]	4.26	.104	.118	8.47	.208	.078	12.82	.312	.059	16.95	.416	.047	21.28	.52	.039	25.64	.624			
	@75°F	.34	2.94		.255[b]	3.92		.128	7.81		.085	11.76		.064	15.63		.051	19.61		.043	23.26				
1.50 lbs/ft³	@40°F	.293	3.41	.094	.22[b]	4.55	.125	.11	9.09	.25	.073	13.70	.375	.055	18.18	.50	.044	22.73	.625	.037	27.03	.75			
	@75°F	.32	3.13		.24[b]	4.17		.12	8.33		.08	12.50		.06	16.67		.048	20.83		.04	25.00				
2.0 lbs/ft³	@40°F	.30	3.33	.125	.21[b]	4.76	.167	.105	9.52	.334	.07	14.29	.501	.053	18.87	.668	.042	23.81	.835	.035	28.57	1.00			
	@75°F	.307	3.26		.23[b]	4.35		.115	8.70		.077	12.99		.058	17.24		.046	21.74		.038	26.32				

Density (per ASTM C303) lbs/cubic ft	1.0	1.25	1.50	2.0
Applicable Standard Specifications: ASTM C578-83 (Types I, II, III); Fed. Spec. HHI-524C	X	X	X	X
Compressive Strength (per ASTM D1621) psi @ 10% Deformation	10-14 psi	13-18 psi	15-21 psi	25-33 psi
Water Absorption (per ASTM C272) % by volume (does not include facer)	<2.5%	<2.5%	<2.0%	<1.0%
Flexural Strength (per ASTM C203) psi	25-30 psi	32-38 psi	40-50 psi	55-75 psi

Note: Above data from SPI

Note a: Available Sizes: Sized material is typically fabricated to order and is available in commonly used dimensions of 2′ x 4′, 3′ x 4′, 4′ x 4′, 4′ x 8′ and custom sizes available in any dimension from 20″ thickness, 48″ wide and 16′ long.

Note b: Thermal Conductance "C" values shown here with a 'b' were supplied by SPI; all others are approximate and were calculated.

Note c: Above Thicknesses were selected to show relative 'C' values and weight per square foot. Typically, EPS can be fabricated to any required thickness up to 24″.

Additional data on plywood and gypsum board is extracted from "ASHRAE Handbook, 1981 Fundamentals."

	Density lbs/ Cu ft	Thickness in inches	Thermal Values C @40	C @75	R @40	R @75	Wts lbs/ sq ft
Extruded Polystyrene	1.4	1	.18	.20	5.55	5.0	.15
		1.5	.14	.145	7.29	6.99	.225
		2	.105	.11	9.72	9.25	.30
		3	.074	.071	14.01	14.05	.45
Extruded Polystyrene	1.8 -	1	.182	.20	5.46	5.0	.148
		1.5	.129	.140	7.79	7.20	.223
		2.0	.097	.105	10.35	9.55	.298
		3	.067	.069	15.09	14.39	.373
Extruded Polystyrene	2.4	1.5	.146	.132	8.17	7.55	.287
		2	.092	.100	10.85	10.00	.383
		3	.061	.066	16.21	15.0	.575
Glass Fiber/ Mineral Fiber		3/4		.36		2.78	.98
		1 1/16		.24		4.17	1.06
		1 5/8		.15		6.67	1.45
		2 7/16		.10		10.00	1.95
		3.0		.08		12.50	2.31
Cellular	8.5	1.5	.216	.233	4.63	4.29	1.1
		2.0	.162	.175	6.17	5.71	1.4
		2.5	.130	.140	7.69	7.14	1.75
		3.0	.108	.117	9.26	8.55	2.1
		4.0	.081	.088	12.35	11.36	2.8
Phenolic	2.5	1.2		.10		10.00	NR
		1.5		.080		12.50	NR
		2.0		.060		16.67	NR
		3.0		.040		25.00	NR
Fiberboard		1/2		.72		1.39	.63
		3/4		.48		2.08	1.01
		1		.36		2.78	1.32
		1.5		.24		4.17	2.12
		2		.19		5.26	NR
Perlite		3/4	.43	.48	2.33	2.08	NR
		1.0	.32	.36	3.13	2.78	.90
		1.5	.22	.24	4.55	4.17	1.35
		2.0	.16	.18	6.25	5.56	1.80
		3.0	.11	.12	9.09	8.33	2.55
Polyurethane	2.0	1.0		.142		7.03	.223
		1.5		.095		10.50	.300
		2.0		.069		14.39	.380
		3.0		.047		21.60	.560
Polyisocyanurate	2.0	1	.14	.147	7.14	6.86	.216
		1.5		.093		10.62	.310
		2.0	.07	.072	14.29	13.89	.403
		2.5	.05	.057	20.0	17.39	.484
		3.0	.043	.047	22.22	20.92	.577
Gypsum or Plaster Board	50	.375		3.10		.32	
		.5		2.22		.45	
		.625		1.78		.56	
Plywood	34	.25		3.20		.31	
		.375		2.13		.47	
		.5		1.60		.62	
		.625		1.29		.77	

NR=Not Reported

INFORMATION ABOUT THE GUIDE

GENERAL

The Commercial, Industrial and Institutional Roofing Materials Guide is published as a service to the roofing industry. The Guide is a comprehensive report containing technical data and other pertinent information on roofing and waterproofing products and information on the manufacturers and suppliers of these products.

An objective of the Guide is to provide information on those product features which will prove helpful to the user in determining generic products which will meet his needs and the listing of other data which will assist the user in choosing specific products. This information is of particular value to those associated with the design, specification, application and use of commercial roofing systems.

The range of information included in the Guide is extensive and includes facts relating to product usage, warranties, company background, etc. plus technical data relating to material properties.

The Commercial, Industrial and Institutional Roofing Materials Guide program is a voluntary program and all manufacturers and suppliers of membrane and insulation board materials may participate by submitting information on their company and on their products in accordance with the procedures developed for this purpose. For full details write: National Roofing Contractors Association, 8600 Bryn Mawr Avenue, Chicago IL 60631.

The information contained in the Guide is a recording of data presented by manufacturers and suppliers through report forms provided by NRCA for this purpose. Only information submitted in accordance with these forms has been included in the Guide.

NRCA has exercised due care in accurately recording the data as supplied by manufacturers and suppliers, but has not audited the test procedures used to secure the reported data and is not responsible for the accuracy or completeness of information as submitted.

NOTE: The listing (or non-listing) of a product (or manufacturer or supplier) in the Guide does not imply that NRCA approves the products nor recommends the use or non-use of any specific materials.

The fact that a material listed herein does or does not meet all of the values of the referenced standards, specifications, recommendations or criteria does not necessarily imply that it will or will not produce an acceptable roofing membrane.

NRCA does not develop standards but works toward and supports the improvement of existing standards and development of new standards by other consensus standards development organizations. As these new standards become available, the Commercial, Industrial and Institutional Roofing Materials Guide will be updated to keep abreast of these state-of-the-art roofing standards activities by including the new standards and, where appropriate, replacing old ones.

For listing purposes it is not mandatory that "test results" be provided for each of the test methods specified in a referenced standard, however, manufacturers and suppliers are encouraged to supply complete "test results" so that the users of theGuide may have access to this information. Succeeding issues of the Guide will permit the inclusion of additional test results as they are reported.

RESTRICTED REGIONS

When a "Restricted Region" is indicated, refer to manufacturer's printed literature to determine geographic region boundaries.

WARRANTY

The manufacturer's printed literature should be referenced to determine the exact terms, limitations, conditions, exclusions and remedies offered under the material/installation warranty.

UL & FM

UL fire resistance and FM wind resistance ratings are awarded on the basis of tests conducted on complete roofing assemblies, of which, the membrane is one component. UL Ratings and FM Approvals for specific membrane products, which have been tested in prescribed assemblies, may be determined by referencing the "UL Fire Resistance Directory" and the "FM Approval Guide."

Building codes often specify UL/FM performance ratings to which the roofing and waterproofing assembly must conform. Compliance of proposed assemblies to these specified ratings may be determined by referencing the documents referred to above.

Because of the limited space available in this publication it is impossible to list the specific roofing assembly components and attachment methods which have been utilized to secure UL or FM ratings. Therefore, all references as to whether a listed BUR specification or single-ply membrane has been awarded a UL or FM rating have been excluded from the Guide. This exclusion is to avoid the erroneous implication to the reader that such ratings are applicable for a material without regard to other components of the roofing assembly or the method of attachment. Refer to the "UL Fire Resistance Directory" and the "FM Approval Guide" to determine ratings which have been awarded for materials listed in the Guide.

MEMBRANES

For multi-ply bituminous membrane products, the referenced document is the National Bureau of Standards, Building Science Series #55 Preliminary Performance Criteria for Bituminous Membrane Roofing - and includes performance parameters for tensile strength, thermal movement and thermal shock.

The basis for "test results" relating to single-ply membrane products are material specification related documents which are the only consensus standards available in North America which cover a majority of single-ply materials now being marketed in the United States. These documents are:

1. Canadian General Standards Board, 37-GP-56M for Modified Bituminous Membranes, July 1980.

2. The RMA Roofing Council, Minimum Requirements for Non-Reinforced Black EPDM Rubber Sheets for Use in Roofing Applications, IPR-1, 1984.

3. The RMA Roofing Council, Minimum Requirements for Fabric-Reinforced Black EPDM Rubber Sheets for Use in Roofing Applications, IPR-2, 1984.

4. The RMA Roofing Council, Minimum Requirements for Fabric-Reinforced Black Polychloroprene Rubber Sheets for Use in Roofing Applications, IPR-3, 1984.

To provide a basis for listing sheet applied single-ply products which are not described in the above documents, a list of 18 optional tests are offered as a basis for listing these types of materials.

ROOF BOARD INSULATION
Listings of roof board insulation manufacturers and converters and the brand name products they supply are organized as follows:

1. Homogeneous Insulating Boards

Any prefabricated roof insulation board product which has one insulation layer component manufactured from any one of several base materials. Top and/or bottom surfaces may or may not be coated or impregnated with asphalt or other binders and/or covered with facer materials such as foils, organic felts, glass fibers, kraft paper, etc.

Generic Classes
A. Expanded Polystyrene
B. Extruded Polystyrene
C. Glass Fiber
D. Cellular Glass
E. Phenolic
F. Fiberboard
G. Perlite
H. Polyurethane
I. Polyisocyanurate
J. Other Homogeneous Materials

2. Composite Insulating Boards

Any prefabricated roof board insulation product which consists of multiple (more than one) layers of insulation(s) and/or a variety of other board materials (typically perlite, fiberboard, plywood, gypsum board, etc) to form a unified bonded multilayer component. Top and/or bottom surfaces may or may not be coated or impregnated with asphalt or other binders and/or covered with facer materials such as foils, organic felts, glass fibers, kraft paper, etc.

PUBLICATION SCHEDULE
The Guide publication schedule is as follows:

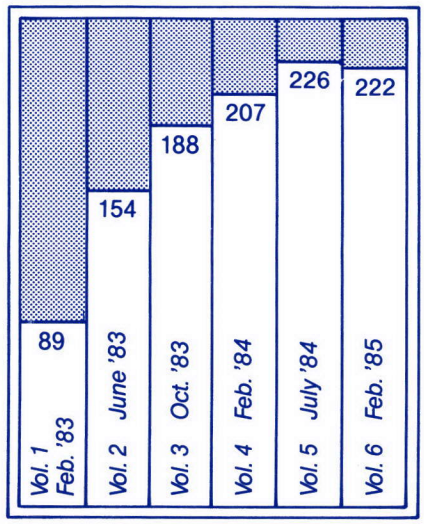
Publication Month	Closing Date
August 1985	June 14, 1985
February 1986	December 10, 1985

SUBSCRIPTION INFORMATION
The Guide is sold on an annual subscription basis (2 issues) at the following rates: NRCA Members, $55.00 per year; Non-Members, $85.00 per year. Multiple subscription rates are available on request.

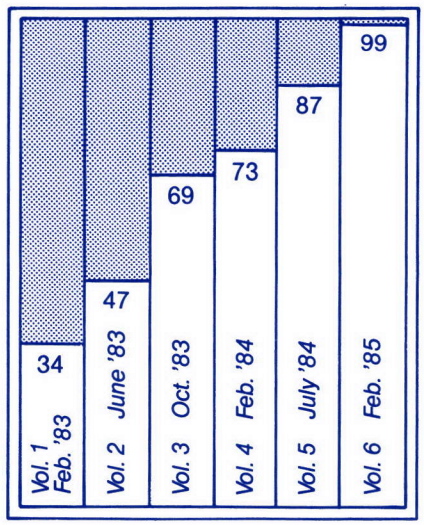
Mail all subscriptions and inquiries to National Roofing Contractors Association, 8600 Bryn Mawr Avenue, Chicago, Illinois 60631.

ROOFING SPECIFICATIONS AND MATERIALS MARKETED IN THE UNITED STATES

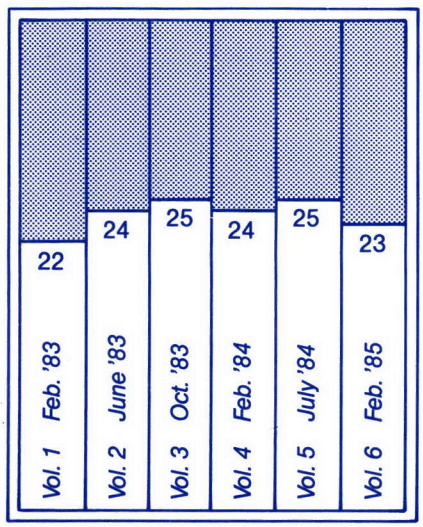
as reported in the Commercial, Industrial and Institutional Roofing Materials GUIDE



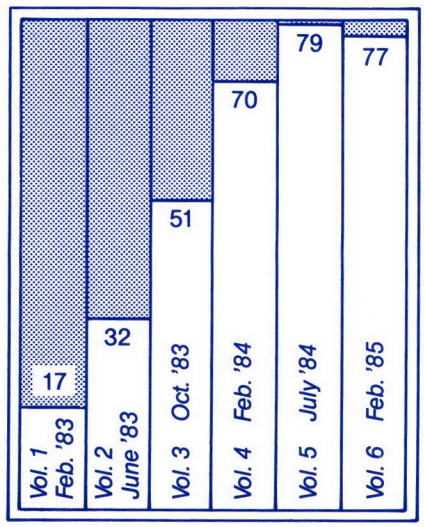
BUILT-UP ROOFING SPECIFICATIONS



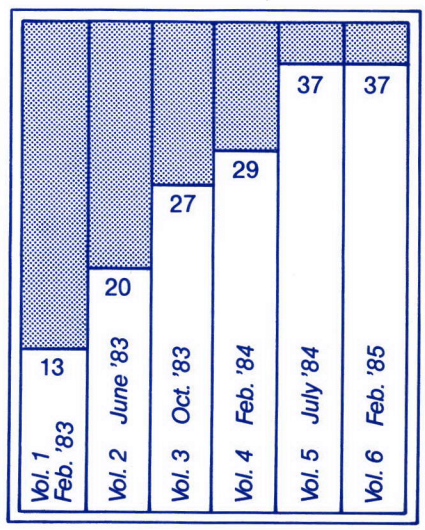
MODIFIED BITUMEN SINGLE-PLY



PVC SINGLE-PLY



EPDM SINGLE-PLY



OTHER SINGLE-PLY