

July 6, 2010

Mr. Lucas Turner, PE
Staff Engineer, NFRC Simulator in Responsible Charge
Hurricane Test laboratory
162 Rocky Creek Lane
Hillsboro, TN 37342

RE: YKK 35H Door System Gaskets; ASTM Specifications

Dear Mr. Turner:

Confirming our telephone conversation of July 2;

Tremco produces the following extrusion from our 60±5 Durometer Dense EPDM rubber compound. This material has been tested in accordance with ASTM C 864, Option II specification. The manufacturing profile drawing, material product data sheet and laboratory test report are attached for your reference.

<u>YKK p/n</u>	<u>Tremco p/n</u>
E2-0083	TR-6096E

Tremco produces the following extrusions from our 70±5 Durometer Dense SCR-900® rubber compound. This material has been tested in accordance with ASTM C 864, Option II specification. The manufacturing profile drawing, material product data sheet and laboratory test report are attached for your reference.

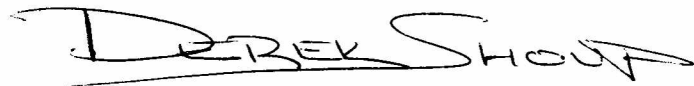
<u>YKK p/n</u>	<u>Tremco p/n</u>
E2-0084	TR-6269W
E2-0085	TR-6270W

Tremco produces the following extrusion from our Closed Cell EPDM rubber compound. This material has been tested in accordance with ASTM C 509, Option II specification. The manufacturing profile drawing, material product data sheet and laboratory test report are attached for your reference.

<u>YKK p/n</u>	<u>Tremco p/n</u>
E2-0088	TR-6151E

If there is anything else I can do for you, please feel free to contact me via phone, fax, or e-mail.

Sincerely,

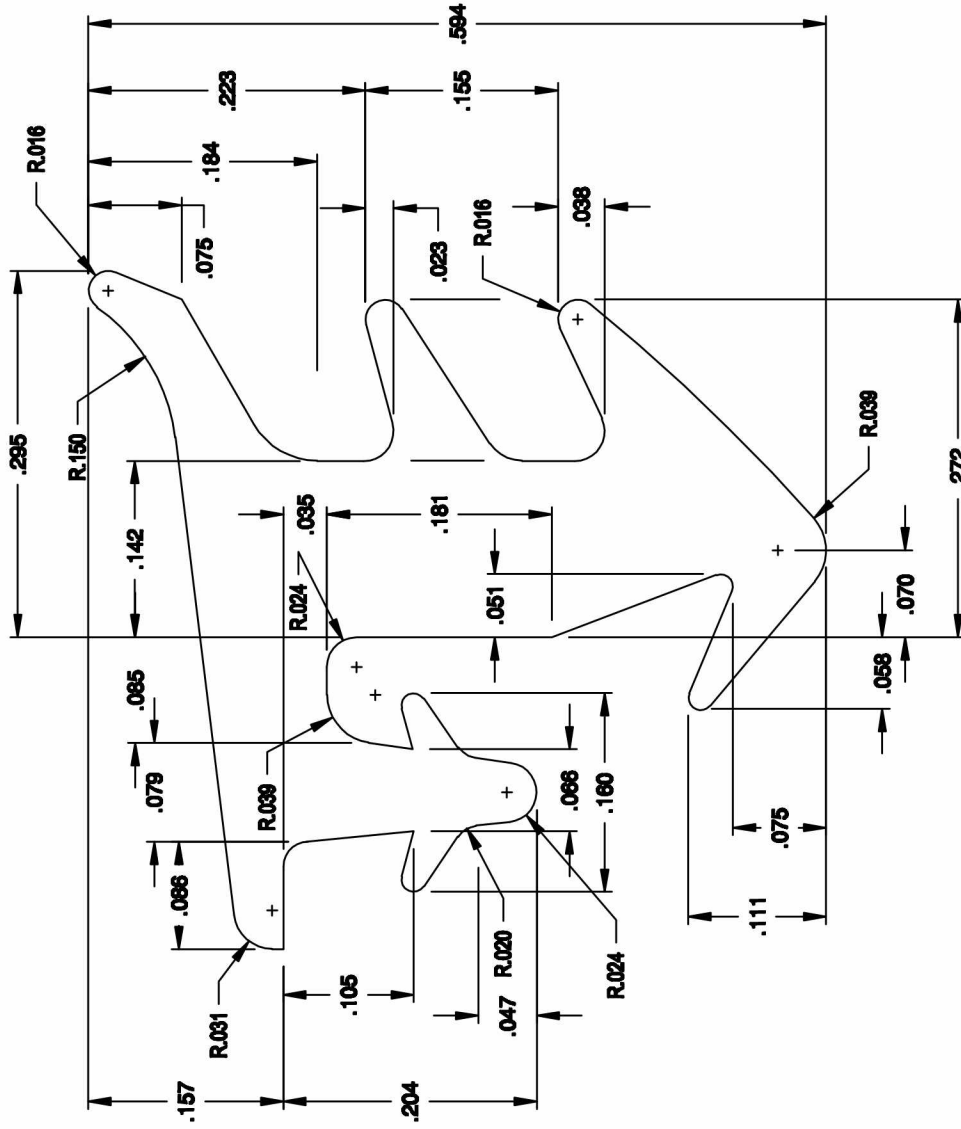


Derek Shoup
Group Leader, Engineered Rubber Products
Direct Line: 419-207-2030
Fax: 419-289-6645
Email: dshoup@tremcoinc.com

Cc: Mr. Jim Stewart; Sales Representative
Mr. Chris Moody; YKK Design Engineer



FULL SCALE



EXTRUSION CUT LENGTH TOLERANCES	
0 - 1.5"	±.000"
1.5" - 2.5"	±.000"
2.5" - 4.0"	±.100"
4.0" - 6.3"	±.130"
6.3" - 10.0"	±.160"
10.0" - 16.0"	±.200"
16.0" - 25.0"	±.250"
25.0" - 40.0"	±.400"
40.0" - 63.0"	±.500"
63.0" - 100.0"	±.630"
100.0" - 160.0"	±.800"
+160.0"	±.50%

No.	Date	Description	By
Tremco. 1451 Jacobson Ave • Ashland, Ohio 44805 U.S.A.			
Customer: YKK AP AMERICA			
Customer Part No. E2-0083			
Project: YHS-50 SYSTEM			
Drawn by: D.TRIGG	Scale: 10X	Date: 5-8-00	
Compound: EPDM	Designed F.G. eee	Drawing No.	
Diameter: 60 ±5	Area: .127		
TR-6096E			

The design of the gasket shown herein is the product of Tremco Incorporated. No reproduction or use of this design is authorized without the consent of Tremco Incorporated.

EPDM

Dense Rubber Extrusions

Product Description

Tremco EPDM Dense Rubber Extrusions are fabricated into gaskets and accessories (such as setting blocks, spacers and shims) for use in sealing and glazing applications in building construction.

Metal Requirements

Tremco EPDM Dense Rubber Extrusions are manufactured to meet existing metal designs or developed with custom metal systems at the design development stage. Many profiles are available depending upon existing metal requirements.

Packaging

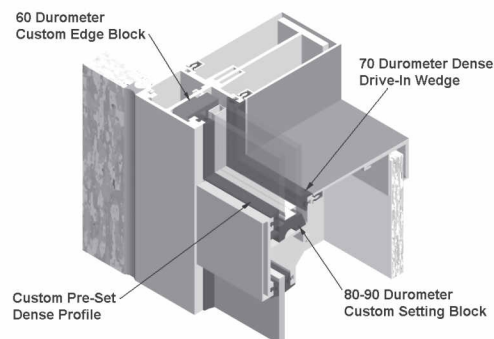
Tremco EPDM Dense Rubber Extrusions are packaged based on customer requirements, profile size, configuration and the need for molded picture frame gaskets.

Availability/Cost

Tremco EPDM Dense Rubber Extrusions are generally custom manufactured but many standard designs are available. Their availability and cost may be obtained from your local Tremco Representative, or by contacting our Customer Service Department in Ashland, Ohio, at 800-321-6357 or in Canada at 800-363-3213.

Warranty

Tremco warrants their products to be free of defects. Under this warranty, Tremco will provide, at no charge, products in containers to replace any product proven to be defective when applied, tested and cured (if applicable), in accordance with Tremco's written instructions, standards and applications recommended by Tremco as suitable for this product. User shall determine suitability of the product for their intended use and assume all risk and liability therewith. Seller shall not be liable for any injury, loss or damage, direct or consequential, arising out of the use of the product. All claims concerning product defects must be made within 12 months of shipment. Absence of such claims in writing, during this period, will constitute a waiver of all claims with respect to such product. This warranty is the user's sole remedy and is IN LIEU OF any and all other warranties expressed or implied, including but not limited to, any implied warranty of MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.



TYPICAL PHYSICAL PROPERTIES

Property	ASTM Test Method	Wedge Gaskets	Accessory Gaskets	Setting Blocks
Shore "A" Hardness	D-2240	68-71	58-62	82-85
Compression Set, 22h @ 100°C	D-395	22-28%	18-29%	26-30%
Ozone Resistance, 100 mPa				
100h @ 40°C, 20% Elongation	D-1149	No Cracks	No Cracks	No Cracks
Tensile Strength	D-412	1810-1925 psi (12.5-13.3 MPa)	1675-1750 psi (11.5-12.1 MPa)	1800-1900 psi (12.4-13.1 MPa)
Elongation @ Rupture	D-412	350-530%	375-550%	175-280%
Tear Strength	D-624	143-209 lb/in (25.0-36.6 kN/m)	160-182 lb/in (28.0-31.9 kN/m)	125-158 lb/in (21.9-27.7 kN/m)
Brittleness Temperature @ -40°C	D-746	Pass	Pass	Pass
Flame Propagation, Option II	C-1166	No Limit	No Limit	No Limit



Tremco Commercial Sealants & Waterproofing

3735 Green Road, Beachwood, OH 44122 // Phone: 216.292.5000 // 800.321.7906
 220 Wicksteed Avenue, Toronto, ON M4H 1G7 // Phone: 416.421.3300 // 800.363.3213
 1451 Jacobson Avenue, Ashland OH 44805 // Phone: 419.289.2050 // 800.321.6357

"Progress Through Innovation, Technology
and Customer Satisfaction"



August 26, 2002

AKRON RUBBER DEVELOPMENT LABORATORY, INC.
2887 Gilchrist Road • Akron, Ohio 44305
1-800-830-ARDL • (330) 794-6600 • FAX (330) 794-6610
Website: www.ardl.com • E-mail: info@ardl.com

TREMCO PART # 3162

- TEST REPORT -

PN# 49424A

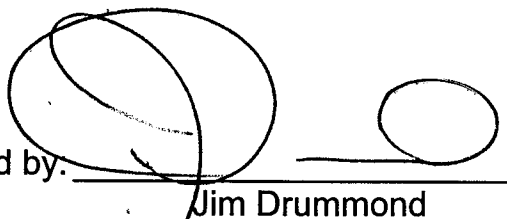
Prepared for:

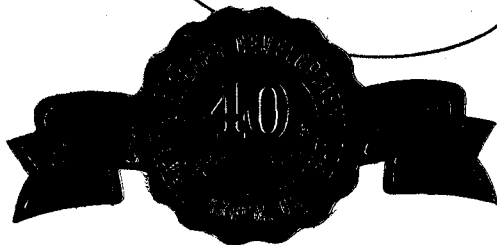
Mr. John Wegman
Tremco, Inc.
1451 Jacobson Avenue
Ashland, Ohio 44805

Prepared by:


Judy Kiefl

Approved by:


Jim Drummond



AN A2LA ACCREDITED LABORATORY
MEMBER OF ACIL: THE ASSOCIATION OF INDEPENDENT SCIENTIFIC,
ENGINEERING AND TESTING FIRMS

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Page 1 of 2- PN# 49424A

August 26, 2002

Mr. John Wegman
Tremco, Inc.
1451 Jacobson Avenue
Ashland, Ohio 44805

AKRON RUBBER DEVELOPMENT LABORATORY, INC.
2887 Gilchrist Road • Akron, Ohio 44305
1-800-830-ARDL • (330) 794-6600 • FAX (330) 794-6610
Website: www.ardl.com • E-mail: info@ardl.com

SUBJECT: Physical testing on material submitted by the above company.

RECEIVED: Five (5) slabs and six (6) compression buttons identified as WJT 7523.

ORIGINAL PHYSICAL PROPERTIES, ASTM D 412-98a, D 2240-02
Die C dumbbells tested at 20 in/min.

	<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
Shore A Durometer, points	63	60 ± 5	Pass
Tensile Strength, psi	1800	1600 min.	Pass
Ultimate Elongation, %	560	250 min.	Pass

HEAT-AGED PROPERTIES, ASTM D 573-99
Specimens aged 70 hrs. @ 100°C in a forced air oven.

	<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
Durometer, point change	+5	+10 max.	Pass
Tensile Strength, % change	-6.9	-15 max.	Pass
Elongation, % change	-31.2	-40 max.	Pass

COMPRESSION SET, ASTM D 395-98, METHOD B
Specimens aged 22 hrs. @ 100°C, 25% deflection, ½ hr. recovery.

	<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
Compression Set, %	18.1	30 max.	Pass

August 26, 2002

Mr. John Wegman
Tremco, Inc.

OZONE RESISTANCE, ASTM D 1149-99

Test specimens per ASTM D 518-99, Method A

Specimens exposed 100 hrs. @ 100 pphm @ 40°C, 20% elongation.

Observations made at 7x magnification.

<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
No cracks	No cracks	Pass

LOW TEMPERATURE BRITTLINESS, ASTM D 2137-94(00), METHOD A

Five modified T-50 specimens conditioned 3 min. @ -40°C in methanol, then tested per Para. 9.3.2.

<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
No cracks	No specimen shall crack	Pass

TEAR RESISTANCE, ASTM D 624-00, DIE C

Specimens tested at 20 in/min.

	<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
Tear Strength, ppi	165	150 min.	Pass

STAINING OF SURFACE, ASTM D 925-88(00), METHOD B

Procedure: ½" x 1" specimens exposed 48 hrs. ten inches below a 275 W, type RS UV bulb

Test Surface: White Automotive Grade Enamel

<u>RESULTS</u>	<u>REQUIREMENTS</u>	<u>PASS/FAIL</u>
No migration stain	No migration stain	Pass

Judy Kiefl

Project Technician

AKRON RUBBER DEVELOPMENT LABORATORY, INC.

Jim Drummond

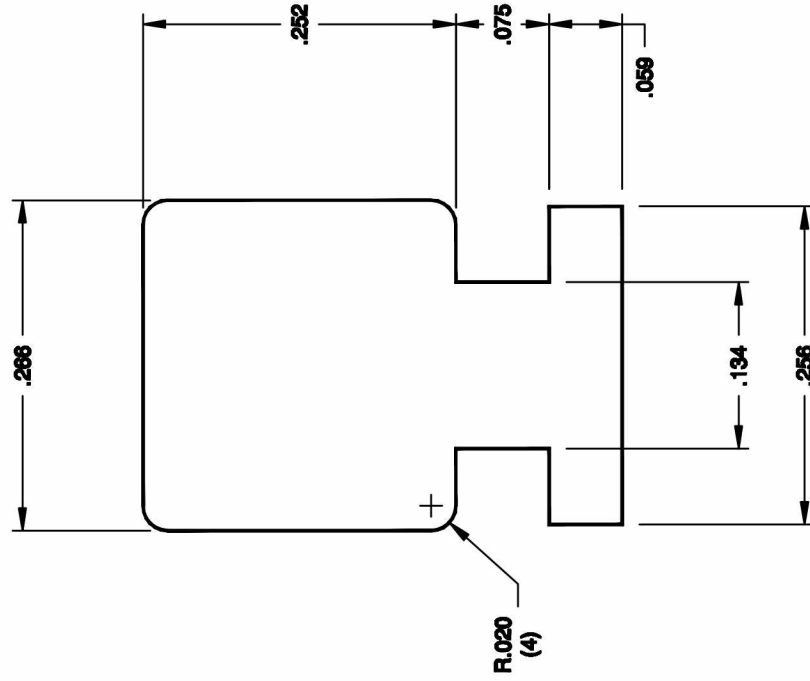
Physical Testing Manager

V# 49424A

JJD/sc

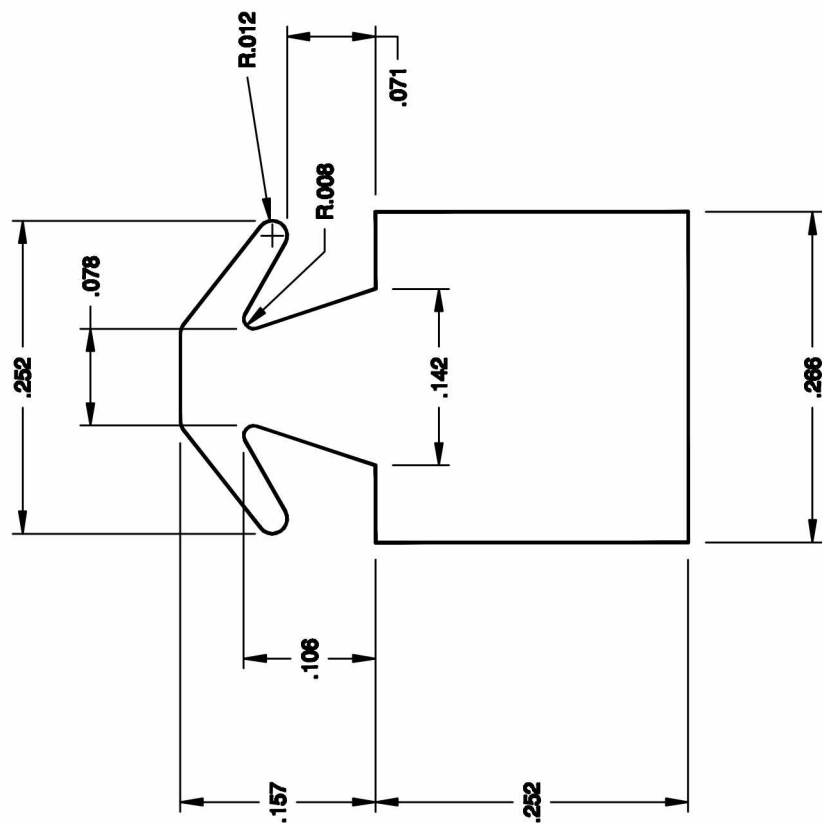


FULL SCALE



No.	Date	Description	By
Tremco.			
1461 Jacobson Ave • Ashland, Ohio 44805 U.S.A.			
Customer:		Customer Part No.	
YKK AP AMERICA		E2-0084	
Project:			
YHS-50 SYSTEM			
Drawn by:	E. TANGO	Scale:	10X
Compound:	SCR-600	Designated F.G.	• .252
Diameter:	70 ±.5	Area:	.092
Drawing No.			TR-6269W

The design of the gasket shown herein is the product of Tremco Incorporated. No reproduction or use of this design is authorized without the consent of Tremco Incorporated.

[illegible]

The design of the gasket shown herein is the product of Tremco Incorporated. No reproduction or use of this design is authorized without the consent of Tremco Incorporated.

SCR-900

Silicone Compatible Rubber

Product Description

SCR-900 Silicone Compatible Rubber Extrusions are fabricated into gaskets and accessories (such as wedges, pre-set spacers, weatherstripping, setting blocks and shims) for use in glazing applications and other building joint applications.

Metal Requirements

SCR-900 Rubber Extrusions are manufactured to meet existing metal designs or developed with custom metal systems at the design development stage. Many profiles are available depending upon existing metal requirements.

Packaging

SCR-900 Rubber Extrusions are packaged based on customer requirements, profile size, configuration and the need for molded picture frame gaskets.

Availability/Cost

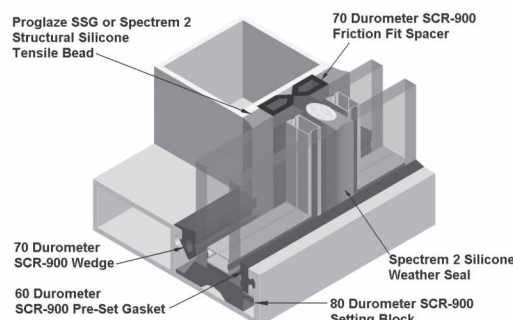
SCR-900 Rubber Extrusions are generally custom manufactured but many standard designs are available. Their availability and cost may be obtained from your local Tremco Field Representative, or by contacting our Customer Service Department in Ashland, Ohio, at 800-321-6357 or in Canada at 800-363-3213.

Warranty

Tremco warrants their products to be free of defects. Under

this warranty, Tremco will provide, at no charge, products in containers to replace any product proven to be defective when applied, tested and cured (if applicable), in accordance with Tremco's written instructions, standards and applications recommended by Tremco as suitable for this product.

User shall determine suitability of the product for their intended use and assume all risk and liability therewith. Seller shall not be liable for any injury, loss or damage, direct or consequential, arising out of the use of the product. All claims concerning product defects must be made within 12 months of shipment. Absence of such claims in writing, during this period, will constitute a waiver of all claims with respect to such product. This warranty is the user's sole remedy and is IN LIEU OF any and all other warranties expressed or implied, including but not limited to, any implied warranty of MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.



TYPICAL PHYSICAL PROPERTIES

Per ASTM C 864 Requirements

PROPERTY	Test Method	60±5 Durometer	70±5 Durometer	80±5 Durometer
Shore "A" Hardness	D-2240	64	71	80
Compression Set, 22 h @ 100°C	D-395	14.6%	11.9%	10.0%
Ozone Resistance, 100 mPa, 100 h @ 40°C, 20% Elongation	D-1149	No Cracks	No Cracks	No Cracks
Tensile Strength	D-412	1850 psi (12.7 MPa)	2004 psi (13.8 MPa)	2240 psi (15.4MPa)
Elongation @ Rupture	D-412	260%	263%	250%
Heat aging, 70 h, 100°C	D 573			
Hardness increase, max points		+2	+2	+2
Change in tensile strength, max %		+7.7	+3.4	-1
Change in elongation, max, %		-6.2	-9.6	-4
Tear Strength	D-624	165 lb/in (28.9 kN/m)	143 lb/in (25.0 kN/m)	150 lb/in (26.2 kN/m)
Brittleness Temperature @ -40°C	D-746	PASS	PASS PASS	
Nonstaining	D 925	No Migratory Stain	No Migratory Stain	No Migratory Stain
Flame Propagation, Option II	C-1166	No Limit	No Limit	No Limit



Tremco Commercial Sealants & Waterproofing

3735 Green Road, Beachwood, OH 44122 // Phone: 216.292.5000 // 800.321.7906
 220 Wicksteed Avenue, Toronto, ON M4H 1G7 // Phone: 416.421.3300 // 800.363.3213
 1451 Jacobson Avenue, Ashland OH 44805 // Phone: 419.289.2050 // 800.321.6357

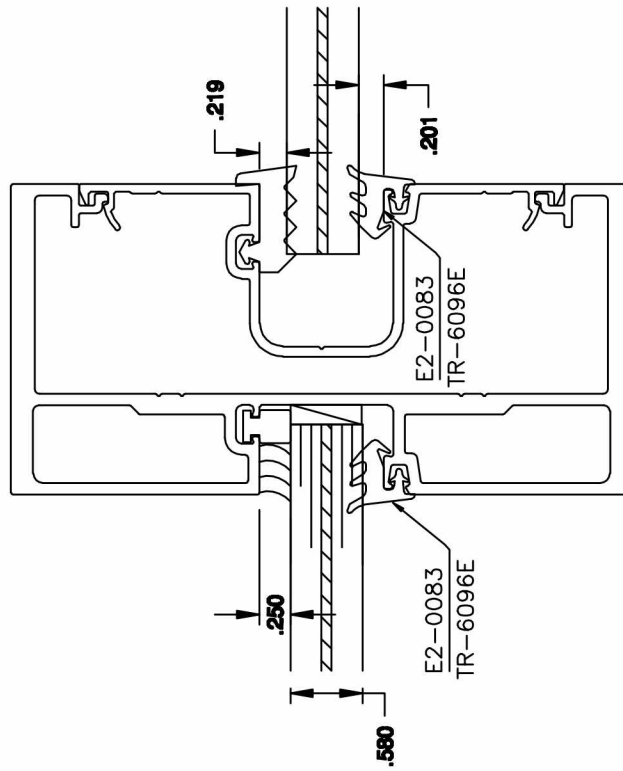


Project #: 59153
Customer: TREMCO, INC. - ASHLAND, OH
Compound: 535 / 70 DURO
Chemist: SinchalM
Order #: 59153-1
Specs: C864 SPEC

Excel Polymers LLC
Development Laboratory
14330 Kinsman Road
Burton, OH 44021-0366

Cure Slab 10 Min. @ 350 °F
Cure Button 30 Min. @ 350 °F

Original Physicals	SPEC	RESULT
D412-06a Tensile.....	1800 PSI MIN	2048 PSI
Elongation.....	200% MIN	217%
D2240-05 Durometer Shore A.....	70 +/-5 PT	72 PT
D624-00 Tear Die C.....		
TStrength.....	100 LBF/IN MIN	162 LBF/IN
D395-03 Compression Set 22 Hrs. @ 100 °C	SPEC	RESULT
Thickness Change (C/S).....		
Thickness % Change.....	30% MAX	6.7%
D573-04 Heat Aging in Air 70 Hrs. @ 100 °C	SPEC	RESULT
Tensile.....		
Tensile % Change.....	15% MAX	4%
Elongation % Change.....	40% MAX	8%
Durometer Shore A.....		
Durometer Change.....	10 PT MAX	1 PT
D925-88-B Migration Stain.....		PASS
D1149-07 Ozone Method B-Procedure B1..... 100 Hrs. @ 40 °C ; 100 mPA OF OZONE Conditioned for 24 Hrs before exposure SAMPLES STRAINED 20%	NO CRACKS	PASS
D2137-05 Brittleness Point Method A	SPEC	RESULT
Brittleness 3 Min. @ -40 °C.....		PASS



FULL SCALE

1		8-3-00	REVISED CLEARANCE INTERIOR PRE-SET	DAT
No.	Date	Description	By	
Tremco. 1451 Jacobson Ave • Ashland, Ohio 44806 U.S.A.				
Customer:		Customer Part No.		
YKK		E2-0088		
Project:		YHS 50 System		
Drawn by:		Scale:	10X	Date: 7-21-00
Compound:		EPDM		Drawing No.
Diameter:		SPONGE		TR-6151E
		Ame:		.245
				±.50%

The design of the gasket shown herein is the product of Tremco Incorporated. No reproduction or use of this design is authorized without the consent of Tremco Incorporated.

Cellular Rubber Extrusions

Product Description

Tremco Cellular Rubber Extrusions are fabricated into gaskets and accessories for use in sealing and glazing applications in building construction.

Metal Requirements

Tremco Cellular Rubber Extrusions are manufactured to meet existing metal designs or developed with custom metal systems at the design development stage. Many profiles are available depending upon existing metal requirements.

Packaging

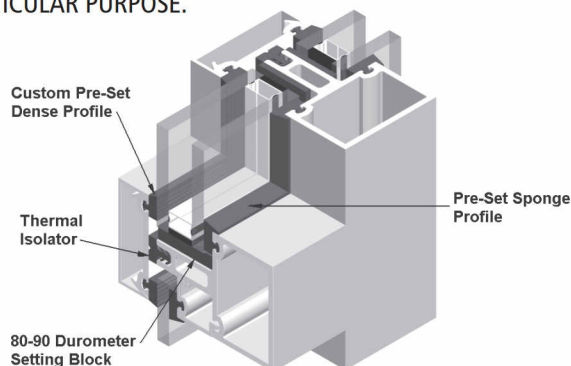
Tremco Cellular Rubber Extrusions are packaged based on customer requirements, profile size, configuration and the need for molded picture frame gaskets.

Availability/Cost

Tremco Cellular Rubber Extrusions are generally custom manufactured but many standard designs are available. Their availability and cost may be obtained from your local Tremco representative, or by contacting our Customer Service Department in Ashland, Ohio, at 800-321-6357 or in Canada at 800-323-3213.

Warranty

We warrant our products to be free of defects. Under this warranty, we will provide, at no charge, product in containers to replace any product proven to be defective when applied, tested and cured (if applicable), in accordance with our written instructions, standards and in applications recommended by Tremco as suitable for this product. User shall determine suitability of the product for this intended use and assume all risk and liability therewith. Seller shall not be liable for any injury, loss or damage, direct or consequential, arising out of the use of this product. All claims concerning product defects must be made within twelve (12) months of shipment. Absence of such claims in writing, during this period, will constitute a waiver of all claims with respect to such product. This warranty is the user's sole remedy and in IN LIEU OF any and all other warranties, expressed or implied, including but not limited to, any implied warranty of MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.



TYPICAL PHYSICAL PROPERTIES

Per ASTM C 509 Requirements

Property	Test Method	Flame Neoprene	Standard EPDM
Compression-Deflection 25% Deflection Limits	D-1056	18-24 psi (124-165 kPa)	19-24 psi (131-165 kPa)
Compression Set 22h @ 70°C	D-395	22-28%	26-30%
Ozone Resistance, 100h @ 40°C 40% Elongation, Type II 300 mPa	D-1149	No Cracks	No Cracks
Water Absorption, % weight	C-1083	2.0-3.0%	2.0-3.5%
Low-Temperature Brittleness @ -40°C	D-746	Pass	Pass
Flame Propagation, Option I	C-1166	Pass	----
Flame Propagation, Option II	C-1166	No Limit	No Limit
Nonstaining	D-925	-----no migratory stain-----	



Tremco Commercial Sealants & Waterproofing

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 220 Wicksteed Avenue, Toronto, ON M4H 1G7 // Phone: 416.421.3300 // 800.363.3213
 1451 Jacobson Avenue, Ashland OH 44805 // Phone: 419.289.2050 // 800.321.6357



..... **Development Lab Test Report**

Project Number:**Originator:** BILL TOTH**Customer:** TREMCO**Compound:** WJT-5559 #4 *SAP 3163***Date:** 3/15/02**BDC Number:** 11420**Attn:** JOHN WEGMAN**Specification:** C-509

PolyOne Elastomers Development Laboratory

14330 Kinsman Road PO Box 366

Burton, OH 44021-0366

*EPDM SPONGE**ARCHITECTURAL GRADE*

	SPECIFICATION	RESULT
D1056:Compressive Modulus: Cured Stk 25% Compression Molulus	13 - 24 PSI	18
D395-98, Method B; (2-PLY) 22 HRS. @ 70°C	30% MAX	28.7%
D865-99 Test Tube Aging 70 HRS @ 100°C 25% Compression Molulus % LENGTH CHANGE	0/+10 PSI	3 -0.7%
D471-98 Fluid Immersion in H2O 24 HRS @ 23°C % WEIGHT CHANGE	5%	3.3%
Low Temperature Brittleness Flex FLEX IN JIG PER ASTM C-509	NO CRACKS	PASS
Ozone D1149-99; Conditioned for 24 HRS before exposure SAMPLES STRAINED 40% TESTED 100 HRS @ 40°C & 100mPA OF OZONE	NO CRACKS	PASS
Stain: D925-88-B; No migratory stain allowed		PASS



..... Development Lab Test Report

Project Number:
Originator: BILL TOTH
Customer: TREMCO
Compound: WJT-5559 #4
Date: 3/15/02

PolyOne Elastomers Development Laboratory
14330 Kinsman Road PO Box 366
Burton, OH 44021-0366

Technician: _____

But Hurst

DATE: 3/23/02

Chemist: _____

Bill Toth

DATE: 3/25/02