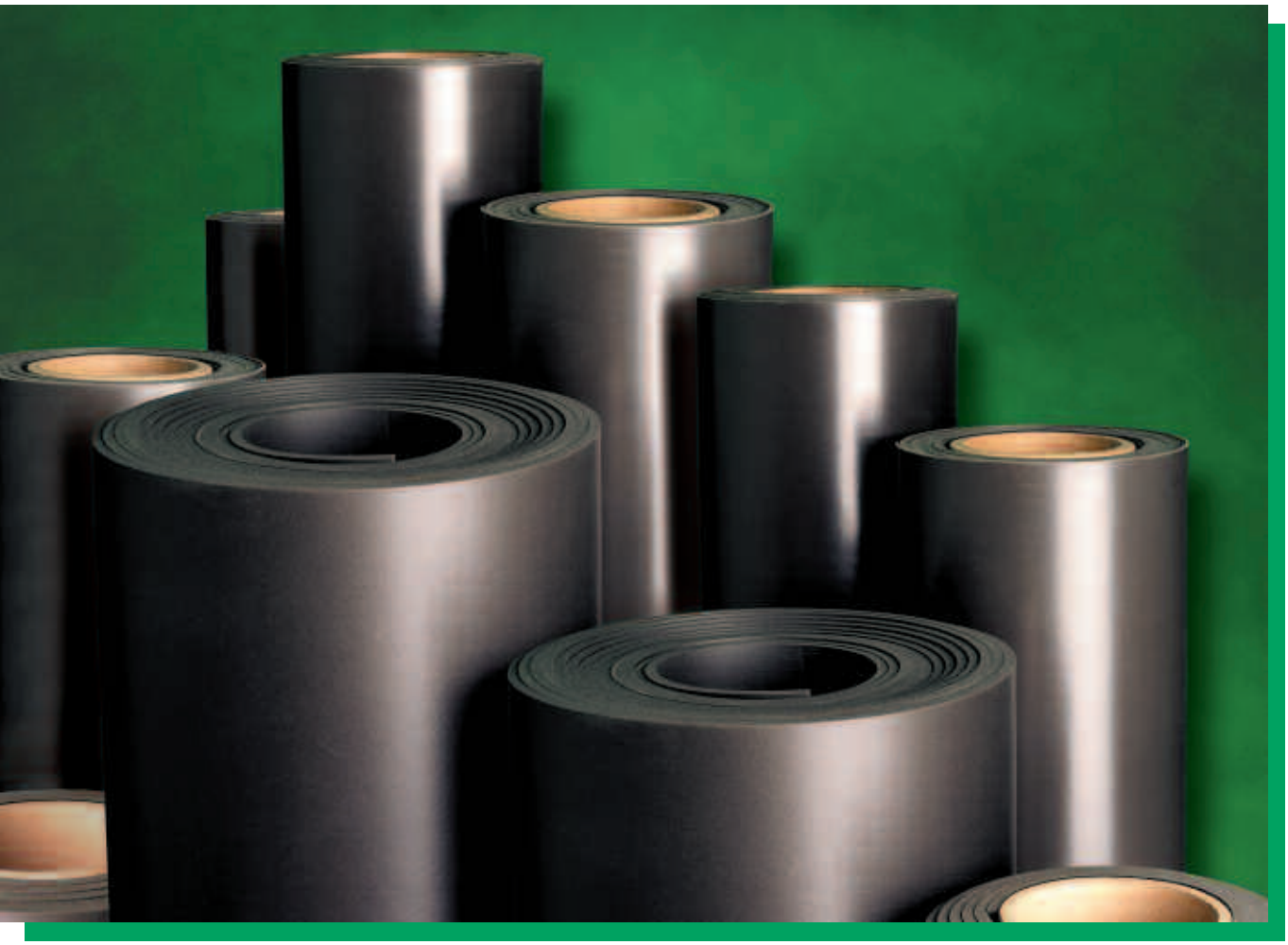


ROGERS CORPORATION

PORON® Urethane Foams

Material Selection Guide

Markets

Communications

Computers

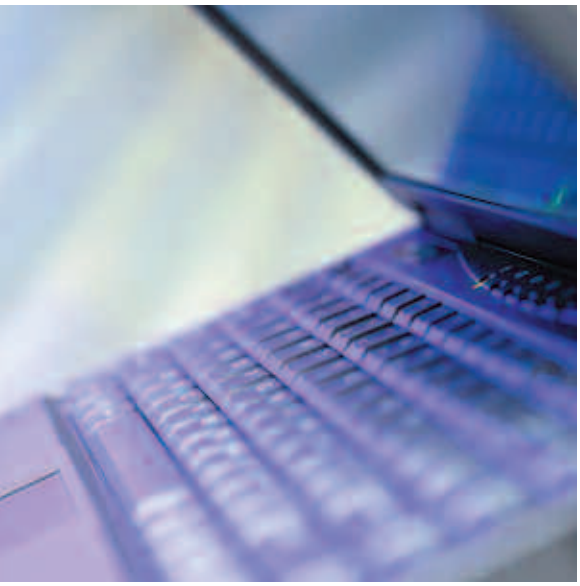
Transportation

Electronics

Appliances

Medical Devices

Industrial



Applications

LCD Gaskets

Battery Pressure Pads

Speaker Gaskets

Environmental Seals

Spacers

Motor Mounts

Vibration Damping Gaskets

Springs

Instrument Cluster Gaskets

Cup Holders

Air Filter Gaskets

Appliance Foot Pads

EMI/RFI Shielding

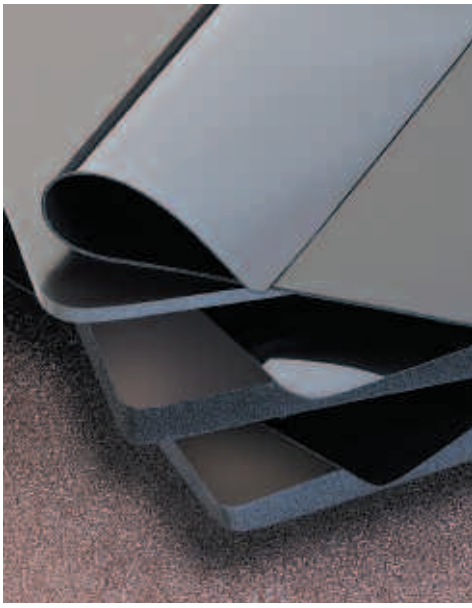
The world runs better with Rogers.®

POR0N® Urethane foams offer a broad range of design solutions for gasketing, sealing and energy absorption. PORON Urethanes are part of the Rogers High Performance Foams family of products, which also include BISCO® Silicones.

Excellent Compression-set Resistance
Durable, long-term performance for gasketing, sealing, and cushioning

Energy Absorption
High resiliency, good vibration isolation and impact attenuation

Low Outgassing
No plasticizers to migrate, non-corrosive to metal, environmentally safe and clean



Broad Temperature Range
Excellent performance from -40°C to 90°C

Inherently Flame Retardant
Many of the materials meet flammability requirements of UL HBF and MVSS 302

Good Chemical Resistance
Exhibits resistance to corrosion, ozone and UV exposure

Easy to Fabricate
Die-cuts cleanly and readily accepts adhesive without surface preparation

Product Consistency
Quality manufacturing, material cast to tight tolerances and precise variations of density and internal strength

Broad Product Offering
Wide range of firmness, density, thickness, and color options available

Quality Service
All products are supported by knowledgeable Rogers Sales Engineers, Technical Service, and Customer Service Representatives

Unsupported Products

Typical Physical Properties										Electrical & Thermal						
Density, lb./ft³ (kg / m³), ASTM D 3574-95 Test A	Compression Force Deflection, Range psi (kPa), **Typical psi (kPa),** 0.2"/min. Strain Rate Force @ 25% Deflection	Hardness, Durometer, Shore "O", **Shore "A"** ASTM D 2240-97	Compression Set, % max. ASTM D 3574-95 Test D @ 73˚F (23˚C)	Compression Set, % max. ASTM D 3574-95 Test D @ 158˚F (70˚C)	Compression Set, % max. ASTM D 3574-95 Test J / Test D after autoclaved 5 hrs. @ 250˚F (121˚C) 22 hrs. @ 176˚F (80˚C) in a forced-air oven	Dimensional Stability, % max. change ASTM D 3574-75 Test E	Tensile Strength, Min. psi (kPa), **Typical psi (kPa)** ASTM D 3574-95 Test E	Tensile Elongation, %, Min., **Typical** ASTM D 3574-95 Test E	Tear Strength, Min. pli (kN/m), **Typical pli (kN/m)** ASTM D 264-91 Die C	Dielectric Constant, K' (TDK), ASTM D 150 measurements @ 72˚F (22˚C) relative humidity 50% for 24 hours.	Dielectric Strength, volts/mil, ASTM D 149-97a	Dissipation Factor, tan D ("DF"), ASTM D 150-98	Volume Resistivity, ohm-cm, ASTM D 257-99	Surface Resistivity, ohm/sq., ASTM D 257-99	Thermal Conductivity, W/m-C (BTU-in/hr-ft²-F) ASTM C 518-98	Coefficient of Thermal Expansion in./in./ºC
12 (192) **± 10**	0.25-2.5 (1.7-17) **1.4 (10)**	-	2	10	5	± 3	12 (83) **30 (207)**	150 **206**	2 (0.4) **5 (0.9)**	-	42	-	-	-	-	2.3-3.1 x 10^{-4}
15 (240) **± 10**	0.3-3.5 (2-24) **2 (14)**	2	2	10	5	± 5	15 (103) **30 (207)**	120 **206**	4 (0.7) **5 (0.9)**	1.48	50	0.04	8 x 10^{11}	10 x 10^{11}	0.083 (0.58)	2.8-3.1 x 10^{-4}
15 (240) **± 10**	1-5 (7-35) **3 (21)**	< 3 **< 3**	2	10	5	± 1	20 (138) **30 (207)**	100 **160**	1 (0.2) **5 (0.9)**	1.75	50	0.05	3 x 10^{11}	6 x 10^{11}	- 0.076 (0.53)	2.3-3.1 x 10^{-4}
20 (320) **± 10**	3-8 (21-55) **5 (35)**	8 **5**					30 (207) **50 (346)**	100 **155**	3 (0.5) **7 (1.2)**							
25 (400) **± 10**	5-12 (35-83) **9 (62)**	16 **12**					35 (242) **70 (484)**	100 **150**	4 (0.7) **10 (1.8)**						-	
15 (240) **± 10**	4-8 (27-55) **6 (41)**	12 **8**	5	10	5	± 1	40 (276) **70 (484)**	100 **160**	3 (0.5) **9 (1.6)**	1.71	50	0.05	1 x 10^{12}	2 x 10^{12}	-	2.3-3.1 x 10^{-4}
20 (320) **± 10**	7-13 (48-90) **11 (76)**	17 **12**					75 (518) **95 (657)**	100 **155**	5 (0.9) **12 (2.1)**						0.086 (0.60)	
30* (480) **± 10**	15-40 (104-276) **25 (173)**	34 **25**					120 (829) **170 (1175)**	100 **145**	12 (2.1) **17 (3.0)**						-	
15 (240) **± 10**	8-14 (55-97) **10 (69)**	18 **13**	5	10	5	± 1	80 (553) **95 (657)**	100 **140**	6 (1.1) **12 (2.1)**	1.63	50	0.05	2 x 10^{12}	7 x 10^{12}	-	2.3-3.1 x 10^{-4}
20 (320) **± 10**	13-23 (90-159) **17 (117)**	24 **18**					120 (829) **145 (1003)**	100 **135**	10 (1.8) **16 (2.8)**						0.090 (0.63)	
30 (480) **± 10**	30-60 (207-415) **39 (269)**	55 **42**					200 (1382) **250 (1729)**	90 **130**	13 (2.3) **24 (4.2)**						-	
15 (240) **± 10**	18-50 (124-345) **36 (249)**	42 **30**	5	10	10	± 5	135 (931) **170 (1175)**	50 **75**	12 (2.1) **19 (3.3)**	1.60	50	0.05	7 x 10^{12}	3 x 10^{12}	-	2.3-3.1 x 10^{-4}
20 (320) **± 10**	35-85 (241-586) **62 (428)**	55 **42**					200 (1382) **275 (1901)**	45 **75**	17 (3.0) **25 (4.4)**						0.088 (0.61)	
25 (400) **± 10**	50-130 (345-896) **93 (643)**	63 **53**					250 (1724) **380 (2627)**	50 **75**	19 (3.3) **30 (5.3)**						-	

Testing Methods Appear in Green

Notes: All metric conversions are approximate. Additional technical services are available.
- Indicates data not available.

Temperature Resistance				Flammability & Outgassing					Environmental						Avail.		
Temperature Resistance, Recommended Constant Use, max., SAE J-2236	Temperature Resistance, Recommended Intermittent Use, max.	Temperature Resistance, Embrittlement ASTM D 746-98	Temperature Resistance, Cold Flexibility MIL-P-12420 D 1991 @ -40˚F (-40˚C)	Flame Resistance, UL HBF (File E20305) (Pass, ≥), **MVSS 302 (Pass, ≥), CSA Component Acceptance HBF (File 188149) (Pass≥)**	Fogging, SAE J-1756 3 hrs @ 212˚F (100˚C)	Outgassing, Total Mass Loss, (TML), % ASTM E 595-93 24 hrs. @ 257˚F (125˚C) @ < 7x10^{-3} Pa	Outgassing, Collected Volatile Condensable Materials (CVCM), % ASTM E 595 24 hrs @ 257˚F (125˚C) @ <7x10^{-3} Pa	Outgassing, Water Vapor Regain (WVR), % ASTM E 595 24 hrs. @ 257˚F (125˚C) @ <7x10^{-3} Pa	Gasketing and Sealing UL-JMS72 (Consisting of UL-50 and UL508), **CAN/CSA–C22.2 No. 94-M91**	Water Absorption, High Humidity Exposure, % weight gain, typical, AMS 3568-95	Water Absorption, Immersion Testing, % weight gain, typical, ASTM D 570-95	UV Resistance, ASTM G 53-96	Ozone Resistance, GM 4486P-95	Corrosion Resistance, AMS 3568-91	Thickness, inches (mm), **Tolerance, %**	Standard Color (Code)	
194˚F (90˚C)	250˚F (121˚C)	-4˚F (-20˚C)	-	0.155 **0.155**	Pass	0.76	0.04	0.6	-	2	38	-	-	-	0.155-0.425 (3.94 - 10.8) **± 10%**	Black (04)	4790-92 Extra Soft–Slow Rebound
194˚F (90˚C)	250˚F (121˚C)	-4˚F (-20˚C)	-	0.118 **0.118**	Pass	1.73	0.14	0.71	File MH15464	2	34	-	-	-	0.125 - 0.500 (3.18 - 12.70) **± 10%**	Black (04)	
				0.188" **0.188"** **0.188"**		0.8	0.1	0.2			12		Pass		0.188 - 0.500 (4.78 - 12.70) **± 10%**		
194˚F (90˚C)	250˚F (121˚C)	-60˚F (-51˚C)	Pass	0.093" **0.062"** **0.093"**	Pass	1	0.1	0.3	File MH15464 **File 188149***	2	9	Good	Pass	Pass	0.062 - 0.125 (1.57 - 3.18) **± 10%**	Black (04)	4701-30 Very Soft
				- **0.062"** -		1.3	0.2	0.6			14		-		0.031 - 0.045 (0.79 - 1.14) **± 15%**		
194˚F (90˚C)	250˚F (121˚C)	-40˚F (-40˚C)	Pass	0.188" **0.188"** **0.188"**	Pass	0.7	0.04	0.3		2	19	Good	Pass	Pass	0.188 - 0.500 (4.78 - 12.70) **± 10%**		
				0.062" **0.062"** **0.062"**	Pass	0.8	0.04	0.3	File MH15464 **File 188149**	2	11	Good	Pass	Pass	0.062 - 0.125 (1.57 - 3.18) **± 10%**	Black (04)	4701-40 Soft
				- - -	-	1.0	0.05	0.62	-	-	9	-	-	-	0.031 - 0.045 (0.79 - 1.14) **± 20%**		
194˚F (90˚C)	250˚F (121˚C)	-40˚F (-40˚C)	Pass	0.188" **0.188"** **0.188"**		0.6	0.04	0.1			13				0.188 - 0.500 (4.78 - 12.70) **± 10%**		
				0.062" **0.062"** **0.062"**	Pass	0.8	0.05	0.3	File MH15464 **File 188149****	2	8	Good	Pass	Pass	0.062 - 0.125 (1.57 - 3.18) **± 10%**	Black (04)	4701-50 Firm
				- **0.045"** -		0.9	0.06	0.4			5				0.031 - 0.045 (0.79 - 1.14) **± 20%**		
158˚F (70˚C)	250˚F (121˚C)	3˚F (-16˚C)	Pass	0.125" **0.125"** **0.125"**		0.6	0.05	0.5			19				0.125 - 0.250 (3.18 - 6.35) **± 10%**		
				0.062" **0.062"** **0.062"**	Pass	0.7	0.02	0.5	File MH15464 **File 188149**	2	20	Good	Pass	-	0.031 - 0.188 (0.79 - 4.78) **± 10%**	Black (04)	4701-60 Very Firm
				0.062" **0.062"** **0.062"**		0.7	0.03	0.6			6				0.031 - 0.093 (0.79 - 2.36) **± 15%**		

Notes: All products exhibit good Mildew/Bacteria Resistance, ASTM G 21-96
All products exhibit no Skin Contact Irritation, Primary Skin Irritation Test (FHSA)
All products exhibit no Staining, ASTM D 925
*Material tested in Azure **Material tested in Gray

Typical Physical Properties											Electrical & Thermal						
Density, lb./ft³ (kg / m³), **Tolerance, %** ASTM D 3574-95 Test A	Compression Force Deflection, Range psi (kPa), **Typical Psi (kPa)**, 0.2"/min. Strain Rate Force Measured @ 25% Deflection	Hardness, Durometer, Shore "O", ASTM D 2240-97	Compression Set, % max. ASTM D 3574-95 Test D @ 73°F (23°C)	Compression Set, % max. ASTM D 3574-95 Test D @ 158°F (70°C)	Compression Set, % max., ASTM D 3574-95 Test J / Test D after autoclaved 5 hrs. @ 250°F (121°C)	Dimensional Stability, % max. change 22 hrs. @ 176°F (80°C) in a forced-air oven	Tensile Strength, Min. psi (kPa), **Typical psi (kPa)** ASTM D 3574-75 Test E	Tensile Elongation, %, Min., **Typical** ASTM D 3574-95 Test E	Tear Strength, Min. pli (kN/m), **Typical pli (kN/m)** ASTM D 264-91 Die C	Dielectric Constant, K' ("DK"), ASTM D 150 measurements @ 72°F (22°C) relative humidity 50% for 24 hours	Dielectric Strength, volts/mil, ASTM D 149-97a	Dissipation Factor, tan D ("DF"), ASTM D 150-98	Volume Resistivity, ohm-cm, ASTM D 257-99	Surface Resistivity, ohm/sq., ASTM D 257-99	Thermal Conductivity, W/m-C (BTU-in/hr-ft²-F) ASTM C 518-98	Coefficient of Thermal Expansion in./in./°C
15 (240) **± 10**	0.3-3.5 (2-24) **1.7 (12)**	2													0.083 (0.58)	
20 (320) **± 10**	1-5 (7-35) **3.2 (22)**	-	2	10	-	-	-	-	-	1.48	50	0.04	8×10^{11}	10×10^{11}	-	2.3-3.1 x 10^{-4}
25 (400) **± 10**	1.25-8.5 (8-58) **5.3 (37)**	-													-	
20 (320) **± 10**	3-8 (21-55) **5.0 (34)**	8													0.076 (0.53)	
25 (400) **± 10**	5-12 (35-83) **8.4 (58)**	16	4	10	-	-	-	-	-	1.75	50	0.05	3.1×10^{11}	5.9×10^{11}	-	2.3-3.1 x 10^{-4}
30 (480) **± 10**	15-45 (103-310) **32 (221)**	55	5	10	-	-	-	-	-	1.63	50	0.05	2×10^{12}	7×10^{12}	0.090 (0.63)	2.3-3.1 x 10^{-4}
15 (240) **± 10**	5-11 (35-76) **9.3 (64)**	11					40 (276) **67 (462)**	100 **149**	6 (1.1) **10 (1.8)**							
20 (320) **± 10**	10-17 (69-117) **15 (103)**	19	5[1]	10[1]	5[1]	± 2	90 (620) **94 (648)**	100 **140**	8 (1.4) **13 (2.3)**	1.71	50	0.05	1×10^{12}	2×10^{12}	-	2.3-3.1 x 10^{-4}
30 (480) **± 10**	15-40 (103-276) **28 (193)**	31					120 (827) **149 (1027)**	100 **136**	15 (2.6) **18 (3.2)**							
30 (480) **± 10**	15-45 (103-310) **32 (221)**	55	5	10	5	± 1	160 (1106) **238 (1641)**	90 **118**	9 (1.6) **25 (4.4)**	1.63	50	0.05	2×10^{12}	7×10^{12}	0.090 (0.63)	2.3-3.1 x 10^{-4}

Testing Methods Appear in Green

Notes: 1. Compression Set, % maximum, after 24 hour recovery
2. PORON Cellular Urethane material is supported by being directly cast onto 2 mil polyester film
All metric conversions are approximate. Additional technical services are available.
- Indicates data not available.

Temperature Resistance					Flammability & Outgassing					Environmental						Avail.	PET Film							
Temperature Resistance, Constant Use, max., SAE J-2236	Temperature Resistance, Intermittent Use, max.	Temperature Resistance, Recommended	Temperature Resistance, Embrittlement, ASTM D 746-98 MIL-P-12420D 1991 @ -40°F (-40°C)	Flame Resistance, UL HBF (File E20305) (Pass, ≥), **MVSS 302 (Pass, ≥)**	Fogging, SAE J-1756 3 hrs @ 212°F (100°C) 12/94	Outgassing, Total Mass Loss (TML), % ASTM E 595 24 hrs. @ 257°F (125°C) @ < 7×10^{-3} Pa	Outgassing, Collected Volatile Condensable Materials (CVCM) % ASTM E 595 24 hrs. @ 257°F (125°C) @ <7×10^{-3} Pa	Outgassing, Water Vapor Regain (WVR), % ASTM E 595 24 hrs. @ 257°F (125°C) @ <7×10^{-3} Pa	Gasketing and Sealing, UL JMST2 (Consisting of UL50 and UL508)	Water Absorption, High Humidity Exposure, % weight gain, typical, AMS 3568-95	Water Absorption, Immersion Testing, % weight gain, typical, ASTM D 570-95	UV Resistance, ASTM G 53-96	Ozone Resistance, GM 4486P-95	Corrosion Resistance, AMS 3568-91	Thickness, inches (mm), **Tolerance, %**	Standard Color (Code)	Density, g/cm³, ASTM D 1505	Tensile Strength MD, psi (kg/cm²), ASTM D 882	Ultimate Elongation, ASTM D 882	Shrinkage MD, % (TD), 39 min. @ 150°C	Yield Strength (F5), psi (kg/cm²), ASTM D 882	Coefficient of Friction A/B, (Kinetic), ASTM D 1894	
		-4°F (-20°C)		0.120		1.73	0.14	0.71			25				0.120 (3.05) **± 10%**								4790-92 Extra Soft–Slow Rebound
194°F (90°C)	250°F (121°C)	0°F (-18°C)	-	0.081	Pass	1.63	0.29	0.49	-	2	23	-	-	-	0.081 (2.06) **± 10%**	Black (04)	1,395	30,000 (2,110)	150	1.2 (0.0)	15,000 (1,050)	0.40	
		-10°F (-12°C)		0.041		1.44	0.27	0.44			14				0.021 - 0.041 (0.53 - 1.04) **± 15%**								
158°F (70°C)	250°F (121°C)	-60°F (-51°C)	Pass	-	Pass	1	0.1	0.3	File MH15464	2	9	Good	Pass	Pass	0.064 - 0.095 (1.63 - 2.36) **± 10%**	Black (04)	1,395	30,000 (2,110)	150	1.2 (0.0)	15,000 (1,050)	0.40	4701-30 Very Soft
194°F (90°C)						1.3	0.2	0.6			14				0.021 - 0.047 (0.53 - 1.19) **± 15%**								
158°F (70°C)	250°F (121°C)	-40°F (-40°C)	Pass	-	Pass	0.9	0.06	0.43	File MH15464	2	5	Good	Pass	Pass	0.012 (0.30) **± 0.003in**	Black (04)	1,395	30,000 (2,110)	150	1.2 (0.0)	15,000 (1,050)	0.40	4701-50 Firm
				0.197"		0.84	0.05	0.4			19				0.188 - 0.500 (4.78 - 12.7) **± 10%**								**Additional Offerings**
194°F (90°C)	250°F (121°C)	-	Pass	-	-	0.97	0.04	0.46	File MH15464	3	9	-	-	-	0.062 - 0.125 (1.57 - 3.18) **± 10%**	Black (04)	-	-	-	-	-	-	4701-41 Soft – Enhanced Sealability
				-		1.0	0.06	0.65			7				0.031 - 0.045 (0.79 - 1.14) **± 20%**								
194°F (90°C)	250° F (121°C)	-40°F (-40°C)	Pass	**0.045"**	Pass	0.9	0.06	0.43	File MH15464	2	5	Good	Pass	Pass	0.017 - 0.020 (0.43 - 0.50) **± 0.003in**	Black (04)	-	-	-	-	-	-	4701-50 Firm–Thin as Cast

Notes: All products exhibit good Mildew/Bacteria Resistance, ASTM G 21-96
All products exhibit no Skin Contact Irritation, Primary Skin Irritation Test (FHSA)
All products exhibit no Staining, ASTM D 925

Supported Products[2]

ROGERS CORPORATION

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World Class Performance

Rogers Corporation (NYSE:ROG), headquartered in Rogers, CT, is a global technology leader in the development and manufacture of high performance, specialty-material-based products for a variety of applications in diverse markets including: portable communications, communications infrastructure, computer and office equipment, consumer products, ground transportation, aerospace and defense. In an ever-changing world, where product design and manufacturing often take place on different sides of the planet, Rogers has the global reach to meet customer needs. Rogers provides the convenience of a worldwide presence and a true understanding of global markets. The world runs better with Rogers.®

High Performance Foams Division
PORON® Urethane Foams
Woodstock, CT, USA
Tel: 860.928.3622
Fax: 860.928.7843
Toll Free: 800.755.6766

The Woodstock, CT Facility
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Certificate No. A-3843

High Performance Foams Division
BISCO® Silicones
Carol Stream, IL, USA
Tel: 630.784.6200
Fax: 630.784.6201
Toll Free: 800.237.2068

www.rogerscorporation.com

Sales

Rogers Corporation
Rogers, CT, USA
Tel: 860.774.9605
Fax: 860.779.5509

Rogers INOAC Corporation
Nagoya, Japan
Tel: +81.52.682.5851
Fax: +81.52.682.1720

Rogers Korea Inc.
Kyungki-Do, Korea
Tel: +82.31.716.6112
Fax: +82.31.716.6208

Rogers N.V.
Gent, Belgium
Tel: +32 9 2353611
Fax: +32 9 2353658

Rogers Shanghai International Trading Co., Ltd.
Shanghai, PRC
Tel: +86.21.6391.6088
Fax: +86.21.6391.5060

Rogers Shanghai International Trading Co., Ltd. Beijing Branch
Beijing, PRC
Tel: +86.10.5900.0828
Fax: +86.10.5900.0826

Rogers Shanghai International Trading Co., Ltd Shenzhen Branch
Shenzhen, PRC
Tel: +86.755.8236.6060
Fax: +86.755.8236.6123

Rogers Taiwan Inc.
Taipei, Taiwan
Tel: +886.2.8660.9056
Fax: +886.2.8660.9057

Rogers Technologies (Singapore) Inc.
Singapore
Tel: +65.6747.3521
Fax: +65.6747.7425

Rogers Technologies (Suzhou) Co., Ltd.
Suzhou, PRC
Tel: +86.512.6258.2700
Fax: +86.512.6258.2858

The information contained in this Material Selection Guide is intended to assist you in designing with Rogers PORON Urethane. It is not intended to and does not create any warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose or that the results shown in this Material Selection Guide will be achieved by a user for a particular purpose. The user should determine the suitability of Rogers PORON Urethane for each application.

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