ROGERS CORPORATION

PORON® Urethane Foams

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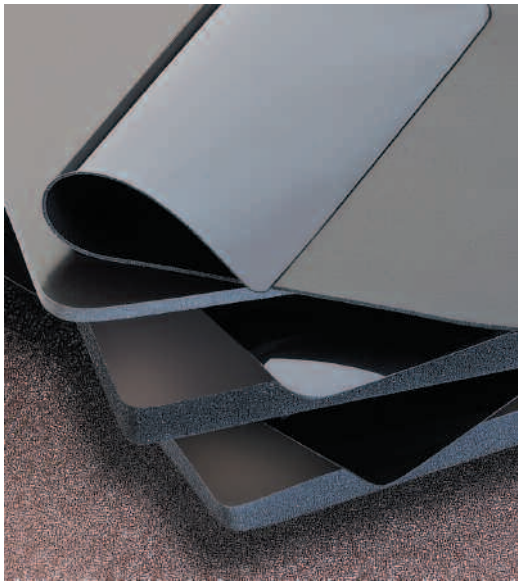
EMI/RFI Shielding

The world runs better with Rogers.®

PORON® Microcellular Urethane foams offer a broad range of design solutions for gasketing, sealing and energy absorption. PORON materials 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

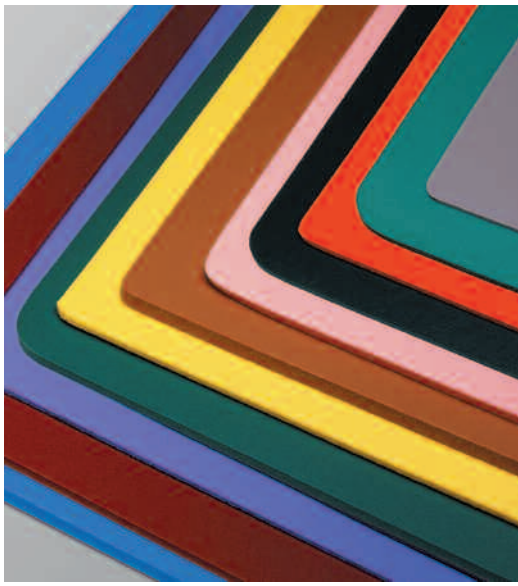


Low Outgassing
No plasticizers to migrate, non-corrosive to metal, environmentally safe and clean

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

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

Good Chemical Resistance
Information is available on material exposure to acids, bases, organic fluids and automotive & household fluids



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

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

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 @ 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)	Dimensional Stability, % max. change 22 hrs. @176°F (80°C) in a forced-air oven	Tensile Strength, Min. psi (kPa), **Typical psi (kPa)**	Tensile Elongation, %, Min., **Typical** ASTM D 3574-95 Test E	Tear Strength, Min. pli (kN/m), **Typical pli (kN/m)** ASTM D 642-91 Die C
12 (192) **± 10**	0.25-2.5 (1.7-17) **1.4 (10)**	-	2	10	5	± 3	12 (83)	150	2 (0.4)
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)**
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)**
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**	2	10	5	± 1	40 (276) **70 (484)**	100 **160**	3 (0.5) **9 (1.6)**
20 (320) **± 10**	7-13 (48-90) **11 (76)**	17 **12**					75 (518) **95 (657)**	100 **155**	5 (0.9) **12 (2.1)**
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**	2	10	5	± 1	80 (553) **95 (657)**	100 **140**	6 (1.1) **12 (2.1)**
20 (320) **± 10**	13-23 (90-159) **17 (117)**	24 **18**					120 (829) **145 (1003)**	100 **135**	10 (1.8) **16 (2.8)**
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**	2	10	10	± 5	135 (931) **170 (1175)**	50 **75**	12 (2.1) **19 (3.3)**
20 (320) **± 10**	35-85 (241-586) **62 (428)**	55 **42**					200 (1382) **275 (1901)**	45 **75**	17 (3.0) **25 (4.4)**
25 (400) **± 10**	50-130 (345-896) **93 (643)**	63 **53**					250 (1724) **380 (2627)**	50 **75**	19 (3.3) **30 (5.3)**

Electrical & Thermal

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
-	42	-	-	-	-	2.3-3.1 x 10^{-4}
1.48	50	0.04	8 x 10^{11}	10 x 10^{11}	0.083 (0.58)	2.8-3.1 x 10^{-4}
1.75	50	0.05	3 x 10^{11}	6 x 10^{11}	0.076 (0.53)	2.3-3.1 x 10^{-4}
1.71	50	0.05	1 x 10^{12}	2 x 10^{12}	0.086 (0.60)	2.3-3.1 x 10^{-4}
1.63	50	0.05	2 x 10^{12}	7 x 10^{12}	0.090 (0.63)	2.3-3.1 x 10^{-4}
1.60	50	0.05	7 x 10^{12}	3 x 10^{12}	0.088 (0.61)	2.3-3.1 x 10^{-4}

Temperature Resistance

Temperature Resistance, Recommended Constant Use, max., SAE J-2236	Temperature Resistance, Recommended Intermittent Use, max.	Temperature Resistance, Embrittlement ASTM D 746-98	
194°F (90°C)	250°F (121°C)	-4°F (-20°C)	-
194°F (90°C)	250°F (121°C)	-4°F (-20°C)	-
194°F (90°C)	250°F (121°C)	-60°F (-51°C)	Pass
194°F (90°C)	250°F (121°C)	-40°F (-40°C)	Pass
194°F (90°C)	250°F (121°C)	-40°F (-40°C)	Pass
158°F (70°C)	250°F (121°C)	3°F (-16°C)	Pass

Flammability & Outgassing

Temperature Resistance, Cold Flexibility MIL-P-12420 D 1981 @ -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), % ASTME 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
0.155 **0.155**	Pass	0.76	0.04	0.6	-
0.118 **0.118**	Pass	1.73	0.14	0.71	File MH15464
0.188" **0.188"** 0.188"		0.8	0.1	0.2	
0.093" **0.062"** 0.093"	Pass	1	0.1	0.3	File MH15464 **File 188149***
- **0.062"** -		1.3	0.2	0.6	
0.188" **0.188"** 0.188"	Pass	0.7	0.04	0.3	File MH15464 **File 188149**
0.062" **0.062"** 0.062"	Pass	0.8	0.04	0.3	
- - -	-	1.0	0.05	0.62	-
0.188" **0.188"** 0.188"	Pass	0.6	0.04	0.1	File MH15464 **File 188149****
0.062" **0.062"** 0.062"		0.8	0.05	0.3	
- **0.045"** -		0.9	0.06	0.4	
0.125" **0.125"** 0.125"	Pass	0.6	0.05	0.5	File MH15464 **File 188149**
0.062" **0.062"** 0.062"		0.7	0.02	0.5	
0.062" **0.062"** 0.062"		0.7	0.03	0.6	

Environmental

Gasketing and Sealing UL JMS72 (Consisting of UL50 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
-	2	38	-	-	-
File MH15464	2	34	-	-	-
		12		Pass	
File MH15464 **File 188149***	2	9	Good	Pass	Pass
		14		-	
File MH15464 **File 188149**	2	19	Good	Pass	Pass
	2	11	Good	Pass	Pass
-	-	9	-	-	-
File MH15464 **File 188149****	2	13	Good	Pass	Pass
		8			
		5			
File MH15464 **File 188149**	2	19	Good	Pass	-
		20			
		6			

Avail.

Thickness, inches (mm), **Tolerance, %**	Standard Color (Code)	
0.155-0.425 (3.94 - 10.8) **± 10%**	Black (04)	4790-92 Extra Soft–Slow Rebound
0.125 - 0.500 (3.18 - 12.70) **± 10%**	Black (04)	
0.188 - 0.500 (4.78 - 12.70) **± 10%**		4701-30 Very Soft
0.062 - 0.125 (1.57 - 3.18) **± 10%**	Black (04)	
0.031 - 0.045 (0.79 - 1.14) **± 15%**		
0.188 - 0.500 (4.78 - 12.70) **± 10%**		4701-40 Soft
0.062 - 0.125 (1.57 - 3.18) **± 10%**	Black (04)	
0.031 - 0.045 (0.79 - 1.14) **± 20%**		
0.188 - 0.500 (4.78 - 12.70) **± 10%**		4701-50 Firm
0.062 - 0.125 (1.57 - 3.18) **± 10%**	Black (04)	
0.031 - 0.045 (0.79 - 1.14) **± 20%**		
0.125 - 0.250 (3.18 - 6.35) **± 10%**		4701-60 Very Firm
0.031 - 0.188 (0.79 - 4.78) **± 10%**	Black (04)	
0.031 - 0.093 (0.79 - 2.36) **± 15%**		

Testing Methods Appear in Green

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

Notes: Products exhibit good Mildew/Bacteria Resistance, ASTM G 21-96
Products exhibit no Skin Contact Irritation, Primary Skin Irritation Test (FHSA)
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 642-91 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}	-	$2.3\text{-}3.1 \times 10^{-4}$
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}	-	$2.3\text{-}3.1 \times 10^{-4}$
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)	$2.3\text{-}3.1 \times 10^{-4}$
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}	-	$2.3\text{-}3.1 \times 10^{-4}$
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)	$2.3\text{-}3.1 \times 10^{-4}$

Testing Methods Appear in Green

Notes: 1. Compression Set, % maximum, after 24 hour recovery
2. PORON Microcellular 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							Supported Products[2]
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-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), % ASTME 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 3658-95	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), 30 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%**								
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	4790-92 Extra Soft–Slow Rebound
		-10°F (-12°C)		**0.041**		1.44	0.27	0.44			14				0.021 - 0.041 (0.53 - 1.04) **± 15%**								
						1	0.1	0.3			9				0.064 - 0.095 (1.63 - 2.36) **± 10%**								
158°F (70°C)	250°F (121°C)	-60°F (-51°C)	Pass	-	Pass				File MH15464	2		Good	Pass	Pass		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: Products exhibit good Mildew/Bacteria Resistance, ASTM G 21-96
Products exhibit no Skin Contact Irritation, Primary Skin Irritation Test (FHSA)
Products exhibit no Staining, ASTM D 925

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
Is Registered to ISO 9001:2000
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.rogerscorp.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: +82.31.291.3660
Fax: +82.31.291.3610

Rogers BVBA
Gent, Belgium
Tel: +32.9.2353611
Fax: +32.9.2353658

Rogers Shanghai Office
Shanghai, PRC
Tel: +86.21.62175599
Fax: +86.21.62677913

Rogers Beijing Office
Beijing, PRC
Tel: +86.10.5820.7667
Fax: +86.10.5820.7997

Rogers Shenzhen Office
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

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