

# MATERIAL SELECTION GUIDE INDUSTRIAL APPLICATIONS



For product designers and engineers, Rogers Corporation is the elastomeric materials solutions partner of choice when quality, innovation, and collaborative support are critical to design optimization and product functionality.

Rogers' materials are designed into products and applications in segments where high reliability and mission-critical performance are essential: automobiles, aerospace, mass transit, electronics, protective gear, footwear, medical products, and much more.

With unrivaled technical support, we foster successful customer relationships through a dedication to technical know-how, application expertise, and global support.



For further information on Rogers' portfolio of elastomeric material solutions, please contact the Rogers' facility closest to you or visit [rogerscorp.com](http://rogerscorp.com).



**PORON® Polyurethane Materials** are the unrivaled long-lasting solution for product designers and engineers addressing mission-critical sealing, shock, and vibration challenges.



## KEY BENEFITS

- ✓ **Resistance to Stress Relaxation and Compression Set**  
Durable, long-term performance for gasketing, sealing and cushioning.
- ✓ **Energy Absorption**  
High resiliency, good vibration isolation and impact absorption.
- ✓ **Low Outgassing**  
No plasticizers to migrate, non-corrosive to metal, environmentally safe and clean.
- ✓ **Broad Temperature Range**  
Reliable performance from -40°C to 90°C.
- ✓ **Chemical Resistance**  
Information is available on material exposure to acids, bases, organic fluids, automotive fluids, and household fluids.
- ✓ **Flame Retardant**  
Many of the materials meet flammability requirements of UL HBF and MVSS 302.
- ✓ **Easy to Fabricate**  
Die cuts cleanly and readily accepts adhesive without surface preparation.
- ✓ **Product Consistency**  
Quality manufacturing resulting in reliable, consistent material properties.
- ✓ **Broad Product Offering**  
Wide range of firmness, density, thickness, and color options available.
- ✓ **Quality Service**  
All products are supported by knowledgeable Rogers Sales and Applications Engineers, Technical Service and Customer Service Representatives.

## MATERIAL SAMPLES PORON® POLYURETHANE FOAMS

### Core Standard Products



**4701-15**  
Soft Seal



**4790-92**  
Extra Soft  
Slow Rebound



**4790-79**  
Shock Seal®



**4701-30**  
Very Soft



**4701-37**  
AquaPro®  
Very Soft



**4701-40**  
Soft



**4701-41**  
AquaPro®  
Soft, Enhanced Sealability



**4701-50**  
Firm



**4701-60**  
Very Firm

### Value-Added Capabilities



Dura-Shape®  
materials



PET  
Supported



ThinStik®  
materials

PRODUCT DATA	Core Standard Products																	Energy Management Products										Water Sealing Products					Product																																
	4701-30 Unsupported			4701-30 Supported		4701-40 Unsupported			4701-40 Supported	4701-50 Unsupported			4701-50 Supported	4701-60 Unsupported			4701-15 Soft Seal Supported			4790-79 ShockSeal® Unsupported			4790-79 ShockSeal® Supported		4790-92 Unsupported			4790-92 Supported				AquaPro® 4701-37		AquaPro® 4701-41																															
Physical Properties																																	Physical Properties																																
Density, kg/m <sup>3</sup> (lb./ft. <sup>3</sup> ) ASTM D 3574-95, Test A	240 (15)	320 (20)	400 (25)	320 (20)	400 (25)	240 (15)	320 (20)	480 (30)	320 (20)	240 (15)	320 (20)	480 (30)	480 (30)	240 (15)	320 (20)	400 (25)	104 (6.5)			192 (12)	240 (15)	320 (20)	144 (9)	192 (12)	192 (12)	240 (15)	144 (9)	192 (12)	240 (15)	320 (20)	400 (25)	480 (30)	224 (14)	304 (19)	240 (15)	320 (20)	480 (30)	Density, kg/m <sup>3</sup> (lb./ft. <sup>3</sup> ) ASTM D 3574-95, Test A																											
Tolerance, %	± 10			± 10		± 10			± 10	± 10			± 10	± 10			16 (±1)			± 10			±10		± 10			± 10				2 (±32)		± 10			Tolerance, %																												
Thickness, mm (in)	4.78 - 12.70 (0.188 - 0.500)	1.57 - 3.18 (0.062 - 0.125)	0.79 - 1.14 (0.031 - 0.045)	0.79 - 2.36 (0.031 - 0.095)	0.53 - 1.19 (0.021 - 0.047)	3.18 - 12.70 (0.125 - 0.500)	1.57 - 3.18 (0.062 - 0.125)	0.79 - 1.14 (0.031 - 0.045)	3.18	4.78 - 12.70 (0.188 - 0.500)	1.57 - 3.18 (0.062 - 0.125)	0.79 - 1.14 (0.031 - 0.045)	3.18 (0.125)	4.78 - 12.70 (0.188 - 0.500)	1.57 - 3.18 (0.062 - 0.125)	0.79 - 1.14 (0.031 - 0.045)	0.53 (0.021)	0.75 (0.030)	1.00 (0.039)	2.03 - 9.53 (0.080 - 0.375)	3.18 - 12.70 (0.125 - 0.500)	1.57 - 4.78 (0.062 - 0.188)	0.53 - 1.0 (0.021 - 0.039)	0.53 - 1.0 (0.021 - 0.039)	3.18 - 10.80 (0.125 - 0.425)	3.18 - 12.70 (0.125 - 0.500)	0.50 - 1.00 (0.020 - 0.039)	0.50 - 1.00 (0.020 - 0.059)	3.05 (0.120)	2.06 (0.081)	0.53 - 1.04 (0.021 - 0.041)	0.30 (0.012)	1.5 - 12.7 (0.059 - 0.500)	0.50 - 1.0 (0.020 - 0.039)	4.78 - 12.70 (0.188 - 0.500)	1.57 - 3.18 (0.062 - 0.125)	0.79 - 1.14 (0.031 - 0.045)	Thickness, mm (in)																											
Tolerance, %	± 10	± 10	± 15	± 10	± 15	± 10	± 10	± 20	±10	± 10	± 10	± 20	0.08 (±0.003)	± 10	± 10	± 20	0.10 (±0.004)			± 10			0.10 (±0.004)		± 10			0.10 (±0.0039)	± 10	± 10	± 10	± 10	± 15	± 10	± 0.10 (0.0039)	± 10			Tolerance, %																										
Standard Color (Code)	Black (04)			Black (04)		Black (04)			Black (04)	Black (04)			Black (04)	Black (04)			Gray (90)			Black (04)			Black (04)		Black (04)			Black (04)				Black (04)		Black (04)			Standard Color (Code)																												
Compression Force Deflection, kPa (psi) 0.51 cm/min (0.2"/min) Strain Rate Force Measured @ 25% Deflection	7-35 (1-5)	21-55 (3-8)	35-83 (5-12)	21 - 55 (3 - 8)	35 - 83 (5 - 12)	27-76 (4-11)	48-90 (7-13)	104-276 (15-40)	48 - 90 (7 - 13)	55-97 (8-14)	90-159 (13-23)	207-415 (30-60)	103 - 310 (15 - 45)	124-345 (18-50)	172-586 (25-85)	345-896 (50-130)	1.38-5.86 (0.20-0.85)			7 - 35 (1 - 5)	14 - 69 (2 - 10)	28 - 110 (4 - 16)	3.4 - 24 (0.5 - 3.5)	7 - 35 (1 - 5)	1.7 - 17 (0.25 - 2.5)	2 - 24 (0.3 - 3.5)	1.7 - 9.3 (0.25 - 1.35)	2 - 17 (0.25 - 2.5)	2 - 24 (0.3 - 3.5)	7 - 35 (1 - 5)	8 - 58 (1.25 - 8.5)	16 - 94 (2.4 - 13.6)	24 - 59 (3.5 - 8.5)	41 - 110 (6 - 16)	41 - 83 (6 - 12)	76 - 138 (11 - 20)	138 - 317 (20 - 46)	Compression Force Deflection, kPa (psi) 0.51 cm/min (0.2"/min) Strain Rate Force Measured @ 25% Deflection																											
Typical kPa, (psi)	21 (3)	35 (5)	62 (9)	34 (5.0)	58 (8.4)	41 (5)	76 (11)	173 (25)	76 (11)	69 (10)	117 (17)	269 (39)	221 (32)	249 (36)	428 (62)	643 (93)	NA	NA	NA	NA	NA	NA	13.7 (2)	20.7 (3)	NA	NA	NA	NA	12 (1.7)	22 (3.2)	37 (5.3)	NA	NA	NA	64 (9.3)	103 (15)	193 (28)	Typical kPa, (psi)																											
Compression Force Deflection, kPa (psi) ISO 6916-1, 30mm/min Strain Rate Force Measured @ 25% Deflection	24 (4)	50 (7)	69 (10)	41 (6)	NA	42 (6)	85 (12)	225 (33)	85 (12)	66 (10)	128 (19)	273 (40)	273 (40)	231 (34)	538 (78)	783 (114)	NA	NA	NA	NA	NA	NA	NA	NA	NA	14 (2)	NA	NA	16 (2)	22 (3)	NA	NA	38 (5)	NA	57 (8)	97 (14)	247 (36)	Compression Force Deflection, kPa (psi) ISO 6916-1, 30mm/min Strain Rate Force Measured @ 25% Deflection																											
Compression Set, % max. ASTM D 3574-95 Test D @ 23°C (73°F) ASTM D 3574-95 Test D @ 70°C (158°F) ASTM D 3574-95 Test J/Test D autoclave 5 hrs @ 121°C (250°F) ISO 1856 Test A @ 70°C (158°F)	2 10 5		4 10 NA		5 10 5			5 10 NA	5 10 5	5 10 10	5 10 10	5 10 10	5 10 5	5 10 10	5 10 10	5 10 10	5 10 5	5 10 10	2 10 NA	2 10 5	2 10 5	5 10 NA	2 10 NA	2 10 5	5 10 NA	2 10 NA	2 10 NA	2 10 NA	0.4 0.8 NA	0.8 NA NA	NA NA NA	NA NA NA	1.5 NA 1.7	NA NA 1.5	5 10 5	2.5	Compression Set, % max. ASTM D 3574-95 Test D @ 23°C (73°F) ASTM D 3574-95 Test D @ 70°C (158°F) ASTM D 3574-95 Test J/Test D autoclave 5 hrs @ 121°C (250°F) ISO 1856 Test A @ 70°C (158°F)																												
Dimensional Stability, % max. change 22hrs @ 80°C (176°F) in a forced-air oven	± 1			NA		± 1			NA	± 1			NA	± 5			NA			NA	NA	NA	NA		± 3	± 5	NA				NA	NA	± 2			Dimensional Stability, % max. change 22hrs @ 80°C (176°F) in a forced-air oven																													
Tensile Strength, min kPa (psi) ASTM D 3574-75 Test E	138 (20)	207 (30)	242 (35)	NA		276 (40)	518 (75)	829 (120)	NA	482 (70)	829 (120)	1382 (200)	NA	931 (135)	1382 (200)	1724 (250)	NA			207 (30)	414 (60)	689 (100)	NA		83 (12)	103 (15)	NA				248 (36)	NA	276 (40)	517 (75)	827 (120)	Tensile Strength, min kPa (psi) ASTM D 3574-75 Test E																													
Tensile Elongation, % min., ASTM D 3574-75 Test E	100			NA		100			NA	100			90	NA	50	45	50	NA			145			NA		150	120	NA				150	NA	100			Tensile Elongation, % min., ASTM D 3574-75 Test E																												
Tear Strength, kN/m (pli), min. ASTM D 264-91 Die C Typical kN/m (pli)	0.2 (1) 0.9 (5)	0.5 (3) 1.2 (7)	0.7 (4) 1.8 (10)	NA		0.5 (3) 1.6 (9)	0.9 (5) 2.1 (12)	2.1 (12) 3.0 (17)	NA	1.1 (6) 2.1 (12)	1.8 (10) 2.8 (16)	2.3 (13) 4.2 (24)	NA	2.1 (12) 3.3 (19)	3.0 (17) 4.4 (25)	3.3 (19) 5.3 (30)	NA			0.9 (5) NA	1.1 (6) NA	1.8 (10) NA	NA		0.4 (2) NA	0.53 (3) NA	NA				NA	NA	1.1 (6) 1.8 (10)	1.4 (8) 2.3 (13)	2.6 (15) 3.2 (18)	Tear Strength, kN/m (pli), min. ASTM D 264-91 Die C Typical kN/m (pli)																													
Temperature Resistance																																	Temperature Resistance																																
Recommended Constant Use, max. SAE J-2236	90°C (194°F)			90°C (194°F)		90°C (194°F)			90°C (194°F)	90°C (194°F)			90°C (194°F)	90°C (194°F)			90°C (194°F)			90°C (194°F)			90°C (194°F)		90°C (194°F)			90°C (194°F)				90°C (194°F)		90°C (194°F)			Recommended Constant Use, max. SAE J-2236																												
Recommended Intermittent Use, max	121°C (250°F)			121°C (250°F)		121°C (250°F)			121°C (250°F)	121°C (250°F)			121°C (250°F)	121°C (250°F)			121°C (250°F)			121°C (250°F)			121°C (250°F)		121°C (250°F)			121°C (250°F)				121°C (250°F)		121°C (250°F)			Recommended Intermittent Use, max																												
Embrittlement ASTM D 746-98	-51°C (-60°F)			-51°C (-60°F)		-40°C (-40°F)			-40°C (-40°F)	-40°C (-40°F)			-40°C (-40°F)	-40°C (-40°F)			-40°C (-40°F)	-16°C (-3°F)			NA			NA	NA	NA	-47°C (-53°F)	-37°C (-35°F)	-20°C (-4°F)		NA	NA	-20°C (-4°F)	-18°C (-0°F)	-12°C (10°F)	NA	-42°C (-44°F)	NA	NA			Embrittlement ASTM D 746-98																							
Cold Flexibility MIL-P 12420D 1991 @ -40°C (-40°F)	PASS			PASS		PASS			PASS	PASS			PASS	PASS			PASS			PASS			PASS		PASS			PASS				PASS		PASS			Cold Flexibility MIL-P 12420D 1991 @ -40°C (-40°F)																												
Flammability																																	Flammability																																
Flammability, mm (in) UL 94HBF (File E20305) (Pass ≥) MVSS 302 (Pass ≥) CSA Comp HBF (File 188149) (Pass ≥)	4.8 (0.188) 4.8 (0.188) 4.8 (0.188)	2.4 (0.093) 1.6 (0.062) 2.4 (0.093)	NA 1.6 (0.062) NA	1.5 (0.059) NA NA	NA NA NA	4.8 (0.188) 4.8 (0.188) 4.8 (0.188)	1.6 (0.062) 1.6 (0.062) 1.6 (0.062)	NA NA NA	NA NA NA	4.8 (0.188) 4.8 (0.188) 4.8 (0.188)	1.6 (0.062) 1.6 (0.062) 1.6 (0.062)	NA 1.1 (0.045) NA	NA NA NA	3.18 (0.125) 3.18 (0.125) 3.18 (0.125)	1.6 (0.062) 1.6 (0.062) 1.6 (0.062)	NA 1.6 (0.062) NA	NA 1.6 (0.062) NA	NA 1.6 (0.062) NA	NA NA NA	4.78 (0.188) 6.35 (0.250) NA	2.03 (0.080) 3.18 (0.125) NA	1.57 (0.062) 1.57 (0.062) NA	NA NA NA	NA NA NA	NA NA NA	3.94 (0.155) 3.94 (0.155) 3.94 (0.155)	3.00 (0.118) 3.00 (0.118) 3.00 (0.118)	NA NA NA	NA NA NA	3.05 (1.20) NA NA	2.0 (0.081) 2.0 (0.081) NA	NA NA NA	NA NA NA	3.00 (0.118) 3.00 (0.118) 3.00 (0.118)	NA NA NA	NA NA NA	4.8 (0.188) NA NA	Flammability, mm (in) UL 94HBF (File E20305) (Pass ≥) MVSS 302 (Pass ≥) CSA Comp HBF (File 188149) (Pass ≥)																											
Environmental																																	Environmental																																
Gasketing and Sealing UL JMST2 (Consisting of UL50 & UL508) CAN/CSA-C22.2 No. 94-M91	File MH15464 File 188149			File MH15464 NA		File MH15464 File 188149			NA NA	File MH15464 NA	File MH15464 File 188149			File MH15464 NA	File MH15464 File 188149			File MH15464 NA			File MH15464 NA			NA NA	File MH15464 NA	File MH15464 NA	File MH15464 NA	File MH15464 NA				NA	File MH15464 NA	NA NA	File MH15464 File 188149			Gasketing and Sealing UL JMST2 (Consisting of UL50 & UL508) CAN/CSA-C22.2 No. 94-M91																											

Supporting Material - Clear Polyester Film (PET)							
Property	Coefficient of Friction A/B, (Kinetic)	Density, kg / m <sup>3</sup> (lb. / ft <sup>3</sup> )	Modules, MD, kPa (psi)	Shrinkage, MD, %, (TD)	Tensile Strength, MD, kPa (psi)	Ultimate Elongation	Yield Strength (FS), kPa (psi)
Test Method	ASTM D 1894	ASTM D 1505	ASTM D 882	39 min. at 150°C	ASTM D 882	ASTM D 882	ASTM D 882
Value	0.4	1.395 (87.1)	3.5x10 <sup>8</sup> (500,000)	1.2 (0.0)	2.1x10 <sup>8</sup> (30,000)	150	1.0x10 <sup>8</sup> (15,000)

## DESIGN TOOLS

### Product Properties Guide

The Product Properties Guide filters PORON® product information by various criteria, providing several material options based on your application requirements.

#### Filters

// Groups: Basic Physical Properties  
 // Sort by Specific Property (Primary): Compression Force Deflection Typical Value  
 // Sort by Specific Property (Secondary): Product Name  
 // 20 to 75 Range

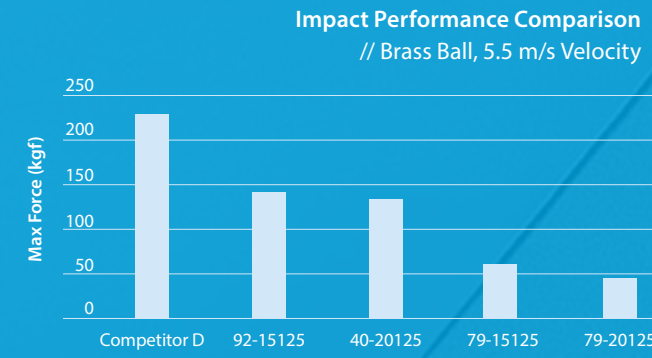
Product	Results						
	4701-30-15	4790-79-12	Condux Plus™ Foam - 0.53 mm	4790-92-20	4701-70-11	4701-70-13	4701-30-20
<b>Physical Properties</b>							
Thickness (Min) (mm)	4.78	2.03	0.53	2.06	12.50	12.50	1.57
Thickness (Max) (mm)	12.70	9.53	N/A	N/A	25.00	25.00	3.18
Thickness Tolerance (%)	+/-10 %	+/-10 %	+/-15 %	+/-10 %	+/-10 %	+/-10 %	+/-10 %
Density ASTM D 3574 Test A (kg/m³)	240	192	N/A	320	168	208	320
Color	Black	Black	Metallic / Black	Black	Pink	Blue	Black
Compression Force Deflection Typical Value @ 25 % (kPa)	21.0	21.0	21.0	22.0	28.0	34.0	35.0
Compression Set (70°C) Max. Value ASTM D 3574 Test D (%)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Tensile Elongation % Typical Value ASTM D 3574 (%)	161	> 145	N/A	N/A	295	360	154



<http://tools.rogerscorp.com/ems/products/poron-properties/index.aspx>

### Impact Prediction Tool

This tool was developed to help you choose the best PORON® Polyurethane or BISCO® Silicone material for energy absorbing applications.

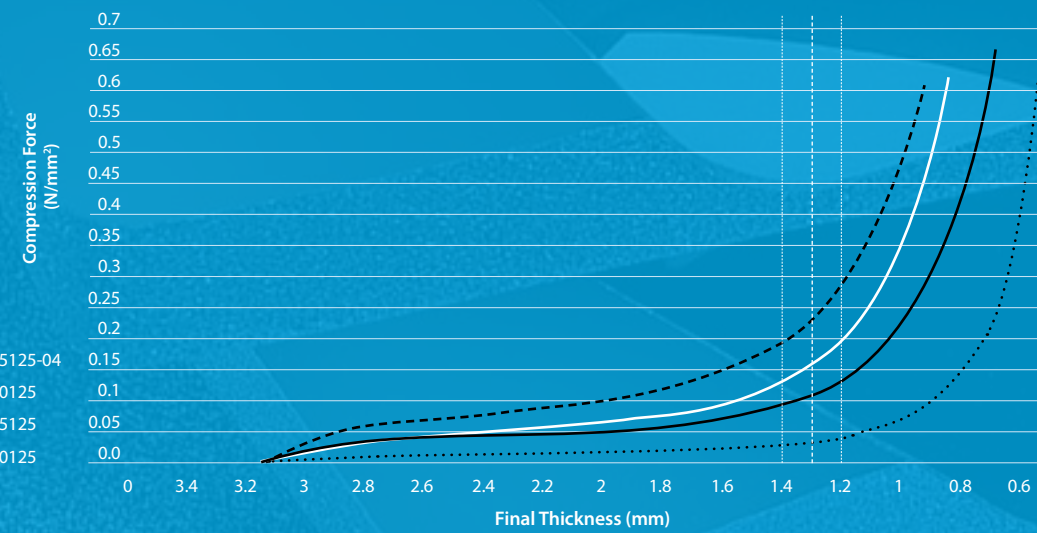


<https://www.rogerscorp.com/ems/tools/impactprediction/index.aspx>

### Gap Filling Tool

The Gap Filling Tool will assist you in choosing the proper PORON® material to meet gap thickness requirements.

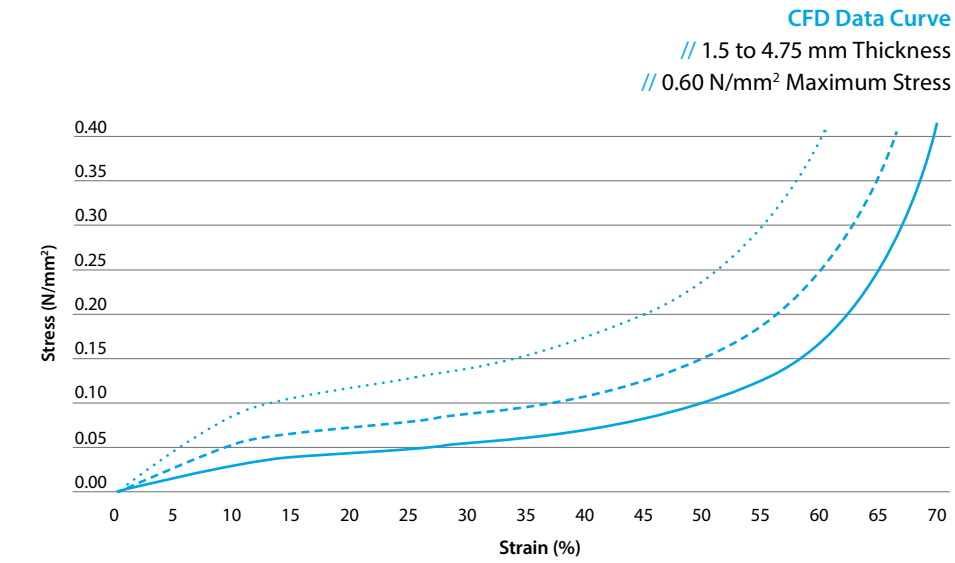
**PORON® CFD Graph**  
 // 1.30 mm Final Gap Thickness  
 // 20 mm² Gasket Surface Area  
 // 0.1 mm Gap Tolerance



<http://tools.rogerscorp.com/ems/gapfilling/index.aspx>

### Compression Force Deflection (CFD) Tool

Using stress-strain data, the CFD Curve Tool helps in the identification of the PORON® material(s) that meet your engineering requirements.



<http://tools.rogerscorp.com/ems/cfdcurve/index.aspx>

### Elastomeric Material Solutions Application Design Tool

The Elastomeric Material Solutions Application Design Tool assists in the identification of PORON® Polyurethane and BISCO® Silicone materials that best meet your design requirements and provides material options based upon your application requirements.

**PORON® Polyurethanes**  
 // PORON® 4701-40  
 // PORON® AquaPro™ 4701-41  
 // PORON® Dura-Shape™ Foams  
 // PORON® ShockSeal™ Materials  
 // PORON® V-0 Foam

**BISCO® Silicones**  
 // BISCO® HT-800  
 // BISCO® L3XX-20  
 // BISCO® RS-720  
 // BISCO® RS-750  
 // BISCO® 7330  
 // BISCO® HT-350

**Configuration**  
 // Application: Sealing & Gasketing  
 // 5.1 - 15.0 mm Thickness  
 // Medium Compressibility

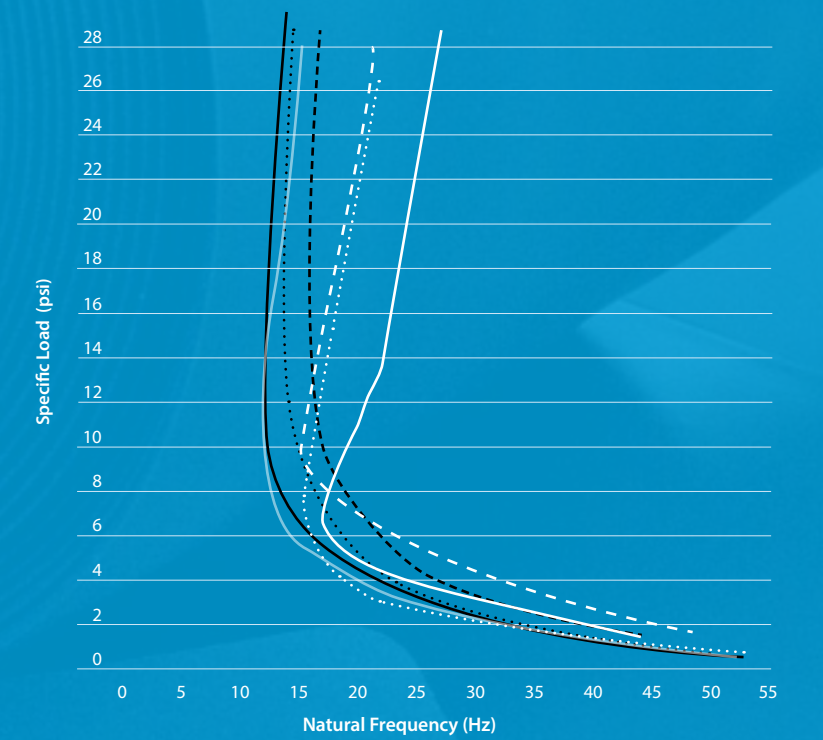


<http://tools.rogerscorp.com/ems/products/msg/index.aspx>

### Vibration Isolation Tool

The Vibration Isolation Tool recommends the proper PORON® polyurethane and BISCO® silicone materials for your vibration mitigation applications. This tool uses your system specifications to calculate the isolation efficiency of Rogers' materials, and provides the most effective material option.

**Natural Frequency Curves**  
 // 0.50 in Pad Thickness, 10 psi Load,  
 // 100 Hz Forcing Frequency



<http://tools.rogerscorp.com/ems/vibration/index.aspx>

Product	BISCO® Silicones			PORON® Polyurethanes			
	HT-800	L3-XX40	L3-XX40	40-15500	41-15500	50-15500	37-14500
Thickness (in)	0.500	0.472	0.630	0.500	0.500	0.500	0.500
Isolation Efficiency (%)	> 97.00	> 94.00	> 94.00	> 97.00	> 96.00	> 95.00	> 94.00
Natural Frequency (Hz)	12	17	15	19	12	16	16

## APPLICATIONS

Environmental Seals

Protective Cases

Water Sealing

Spacers

Motor Mounts

Cushioning

Vibration Isolation

Springs

Gaskets

EMI / RFI Shielding

Sound Damping

Gap Filling

Light Blocking

[and more ...](#)



**Car Lights**  
Water Sealing,  
Light Blocking



**Appliance Foot Pads**  
Spacing, Cushioning



**Smartphone Protective Case**  
Gasketing

For more information  
please visit us at  
[www.rogerscorp.com/ems/poron/index.aspx](http://www.rogerscorp.com/ems/poron/index.aspx)



For more information visit [rogerscorp.com/ems](http://rogerscorp.com/ems)

### World Class Performance

Rogers Corporation (NYSE:ROG) is a global leader in engineered materials to power, protect, and connect our world. With more than 180 years of materials science experience, Rogers delivers high-performance solutions that enable clean energy, internet connectivity, and safety and protection applications, as well as other technologies where reliability is critical. Rogers delivers Power Electronics Solutions for energy-efficient motor drives, vehicle electrification and alternative energy; Elastomeric Material Solutions for sealing, vibration management and impact protection in mobile devices, transportation interiors, industrial equipment and performance apparel; and Advanced Connectivity Solutions for wireless infrastructure, automotive safety and radar systems.

Headquartered in Arizona (USA), Rogers operates manufacturing facilities in the United States, China, Germany, Belgium, Hungary, and South Korea, with joint ventures and sales offices worldwide.

[www.rogerscorp.com](http://www.rogerscorp.com)

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Fax: 86-755-8236-6123

Rogers Korea, Inc.  
Gyonggido, Korea  
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Fax: 82-31-360-3623

Rogers Technologies, Co.  
Beijing, China  
Tel: 86-10-8559-7599  
Fax: 86-10-8559-7585



Rogers is committed to producing quality products in a safe environment manufactured with robust management systems certified to industry standards.