

**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.

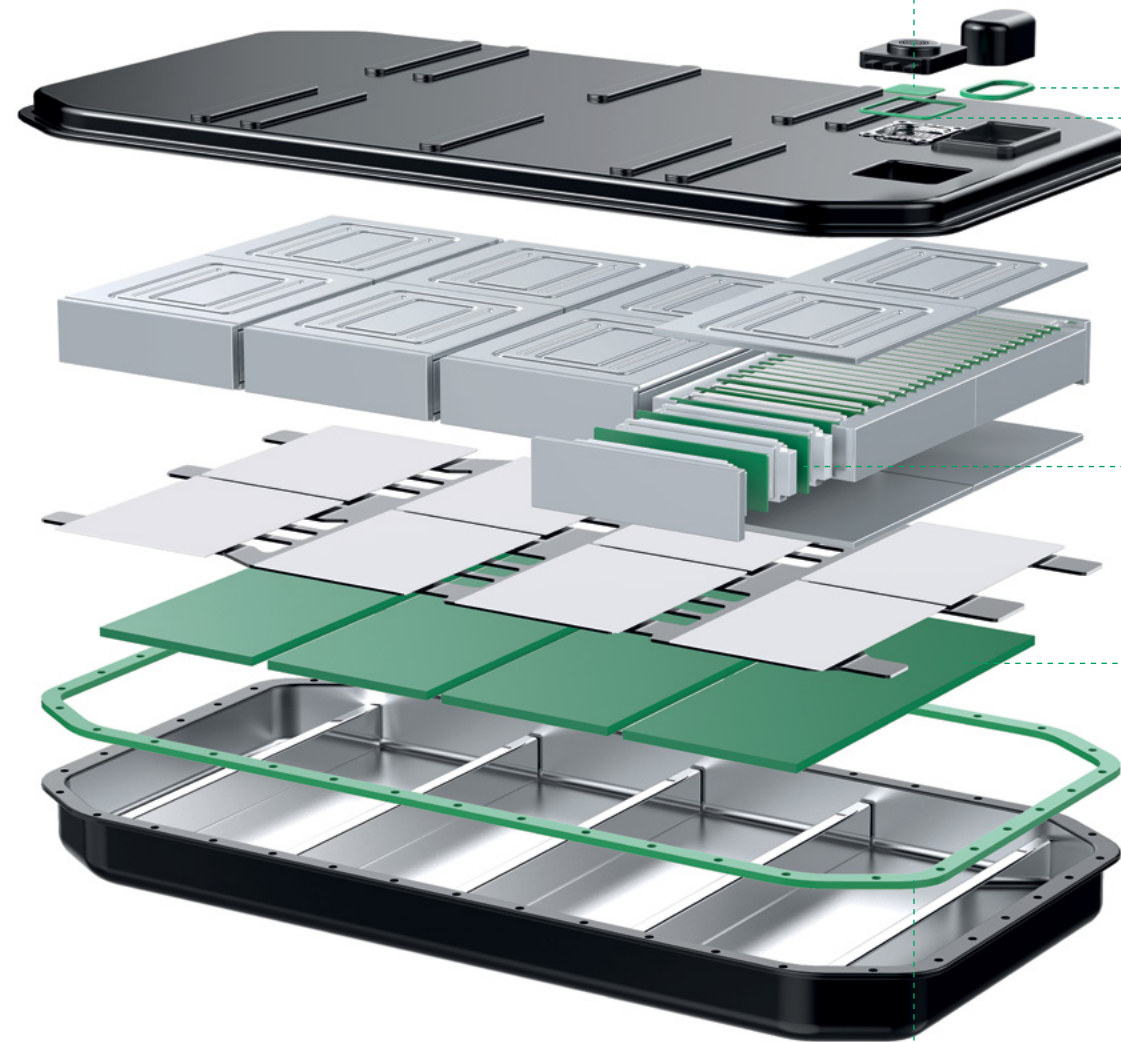


For further information on Rogers' portfolio of elastomeric material solutions, please contact the Rogers' facility closest to you or visit rogerscorp.com.



BISCO® Silicone Materials are the unrivaled long-lasting solution for product designers and engineers addressing mission-critical sealing, shock and vibration challenges under extreme conditions or safety requirements.

Pouch Cell Battery Pack



Venting Films

DeWAL® V-Series venting material for battery air pressure management.

Manual Service Disconnect Seal

BISCO® materials are used as a reliable environmental seal that withstands repeated opening and closing. The materials' flame resistance (UL-V0) contributes to the safety requirements for high voltage batteries.

Pouch Cell Pads

PORON® polyurethanes pouch cell pads hold components in place, while withstanding dimensional changes to the pouch cells over the life of the battery. In parallel, they protect the cells against internal impact and vibration.

Cooling Plate Spring Pads

BISCO® silicones and PORON® polyurethanes are used as reliable elastomeric springs to maintain close contact between the cooling plate and the battery, ensuring performance.

Battery Housing Seal

BISCO® silicones provide ingress protection over the lifetime of the battery pack.

KEY BENEFITS

- ✓ **Superior Flame Ratings**
Meets the highest UL, railway and aerospace standards.
- ✓ **Low Flame, Smoke, and Toxicity**
During combustion.
- ✓ **Excellent Performance**
At extreme high and low temperatures.
- ✓ **Superior Resistance to Compression Set**
At ambient and elevated temperatures.
- ✓ **Natural Resistance to UV and Ozone**
- ✓ **Good Sealability with Low Compression**
- ✓ **Product Consistency**
Quality manufacturing resulting in reliable and consistent material properties.
- ✓ **Broad Product Offering**
Wide range of firmness, density, and thickness options available.
- ✓ **Quality Service**
All products are supported by knowledgeable Rogers Sales and Applications Engineers, Technical Service and Customer Service Representatives.

MATERIAL SAMPLES BISCO® SILICONES

Cellular



BF-2000



BF-1000



HT-870



HT-800



HT-820



HT-840

Specialty with Substrate



FPC



IF-200



RF-120



MF1®

Bun

Solid

1200 series



HT-1240



HT-1250



HT-1260



HT-1270

6000 series



HT-6220



HT-6210



HT-6135



HT-6240



HT-6360

Specialty



HT-200



EC-2130

PRODUCT DATA

Typical values shown unless otherwise noted.
Refer to datasheet for specification values.

		Cellular							Solid							Specialty																																																					
		Continuous Roll							Bun							w/substrate																																																					
		Silicone Foam							General Purpose Silicone							Performance Grade							Flame Resistant							Press Pad							EMI Shielding							Acoustic Barrier							Flame Barrier							Heat Shield							Abrasion Resistance				
Product	BF-2000	BF-1000	HT-870	HT-800	HT-820	HT-840	MF1-55	HT-1240	HT-1250	HT-1260	HT-1270	HT-6210	HT-6220	HT-6135	HT-6240	HT-6360	HT-1500	EC-2130	HT-200	FPC	RF-120	IF-200	Product																																														
Standard Color	Black	White, Gray, Black	Red, Black	Black, Gray, Red	Gray	Gray	Gray	Red							Gray	Black	Cream	Transparent	Black	Red	Dark Gray	Black	White	White	White	Standard Color																																											
Physical Properties	Standard																						Physical Properties	Standard																																													
Thickness mm (in)	3.18-12.70 (0.125-0.500)	1.59-25.40 (0.063-1.000)	1.59-12.70 (0.063-0.500)	0.79-12.70 (0.031-0.500)	0.79-6.35 (0.031-0.250)	1.59-6.35 (0.063-0.250)	6.35-203.2 (0.250-8.00)	0.79-3.18 (0.031-0.125)							0.250-3.18 (0.010-0.125)	0.250-3.18 (0.010-0.125)	0.250-1.59 (0.01-0.063)	0.250-3.18 (0.010-0.125)	0.50-3.18 (0.020-0.125)	0.079-3.18 (0.031-0.125)	1.59-3.18 (0.063-0.125)	HT-200 defined by areal density	1.59-6.35 (0.063-0.250)	2.50, 5.00 (0.098, 0.197)	5.00 (0.197)	Thickness mm (in)																																											
Density																							Density																																														
Density, kg/m ³ (lb./ft. ³)	175 (11) Max 200 (12.5)	192 (12) 156-287 (9.8-17.9)	240 (15) 215-327 (13.4-20.4)	352 (22) 300-473 (18.7-29.5)	384 (24) 336-528 (21-33)	448 (28) 369-553 (23.7-34.5)	112 (7.0) 45-55 (6.5-8)																						320 (20) min.																																								
Areal Density, kg/m ² (lb./ft. ²)																							Areal Density, kg/m ² (lb./ft. ²)																																														
Specific Gravity Internal Method (g/cc)																							Specific Gravity Internal Method (g/cc)																																														
Firmness																							Firmness																																														
Compression Force Deflection, kPa (psi)	ASTM D1056 @ 25% Deflection	10 (1.5) 0-17 (0-2.5)	16.5 (2.4) 0-35 (0-5)	26 (3.8) 7-48 (1-7)	67 (9.7) 41-97 (6-14)	106 (15.3) 82-138 (12-20)	142 (20.6) 110-179 (16-26)	5.5 (0.8) 2.8-10.3 (0.4-1.5)																						ASTM D1056 @ 25% Deflection																																							
Durometer, Shore A, except HT-6210 Shore OO	ASTM D2240								40 +/- 5	50 +/- 5	60 +/- 5	70 +/- 5	62 +/- 4	22 +/- 5	35 +/- 5	40 +/- 5	65 +/- 5	70 +/- 10	80 +/- 10																																																		
Compression Set (%)	ASTM D1056 @ 100°C (212°F)	6.9	1.7	1.6	2.4	2.6	1.8	1.5																																																													
	ASTM D395 @ 150°C (302°F)								25	25	25	25	25	25	25	35	35		30																																																		
	ASTM D395 @ 175°C (347°F)																													Refer to BF-1000 for properties (foam only)																																							
Tensile Strength, kPa (psi)	ASTM D412	140 (20)	140 (20)	240 (35)	240 (35)	240 (35)	240 (35)	69 (10)	7650 (1110)	7100 (1030)	6950 (1010)	7200 (1050)	3300 (480)	4400 (640)	5500 (800)	7170 (1040)	1720 (250)	300/300	2068 (300)								ASTM D1056 @ 100°C (212°F)																																										
HT-1500- Tensile Fill/Tensile Warp (ppi)	ASTM D751																							ASTM D395 @ 150°C (302°F)																																													
Tensile Elongation (%)	ASTM D412	60	60	20	45	45	45	35	530	370	260	210	565	580	450	325	125		40								ASTM D395 @ 175°C (347°F)																																										
Water Absorption (%)		1.4	0.5	0.5	0.5	0.5	0.5	5																																																													
Tear Resistance (ppi)	ASTM D624																							ASTM D624																																													
Flammability																							Flammability																																														
Flame Resistance	UL 94 (File E83967) V-0 ; HF-1	Meets	Meets	Meets	Meets	Meets	Meets	Meets										Meets	Meets	Meets	Meets	Meets	Meets	UL 94 (File E83967) V-0 ; HF-1																																													
Flame Spread Index (Is)	ASTM E162, Flaming Mode <35	Meets	Meets	Meets	Meets	Meets	Meets	Meets										Meets	Meets	Meets	Meets	Meets	Meets	ASTM E162, Flaming Mode <35																																													
Smoke Density (Ds)	ASTM E662 Flaming Mode @ 1.5 min, <100 Flaming Mode @ 4.0 min, <200	Meets	Meets	Meets	Meets	Meets	Meets	Meets										Meets	Meets								ASTM E662 Flaming Mode @ 1.5 min, <100 Flaming Mode @ 4.0 min, <200																																										
Burn Length	FMVSS 302, <100mm/min	Meets	Meets	Meets	Meets	Meets	Meets	Meets																Meets																																													
Outgassing																							Outgassing																																														
Toxic Gas Emissions Rating	SMP-800-C @ 1.5/4.0 min	Meets	Meets	Meets	Meets	Meets	Meets	Meets										Meets	Meets	Meets	Meets	Meets	Meets	SMP-800-C @ 1.5/4.0 min																																													
Total Mass Loss (%)	ASTM E595 @ (4x10 ⁻⁶ Torr)	3.81	3.46	1.19	0.98	2.11	2.08																	ASTM E595 @ (4x10 ⁻⁶ Torr)																																													
Collected Volatile Condensable Materials (CVCM) (%)	ASTM E595 @ (4x10 ⁻⁶ Torr)	1.14	1.12	0.34	0.25	0.63	0.57																	ASTM E595 @ (4x10 ⁻⁶ Torr)																																													
Water Vapor Regain (%)	ASTM E595 @ (4x10 ⁻⁶ Torr)	0.07	0.04	0.02	0.03	0.02	0.01																	ASTM E595 @ (4x10 ⁻⁶ Torr)																																													
Temperature Resistance																							Temperature Resistance																																														
Recommended Constant Use		-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-62°C- +219°C	-62°C- +219°C	-62°C- +219°C	-62°C- +219°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	-55- +200°C	Recommended Constant Use																																													
Thermal Conductivity (W/m *K)	ASTM C518	0.048	0.054	0.06	0.076	0.09	0.09	0.04					0.19	0.22	0.31	0.2	0.1		0.8	0.8	0.08	0.07	0.06	ASTM C518																																													
Low Temperature Flex	ASTM D1056 @ -55°C (-67°F)	Pass	Pass	Pass	Pass	Pass	Pass																	ASTM D1056 @ -55°C (-67°F)																																													
Low Temperature Brittleness	ASTM D746 @ -55°C (-67°F)																							ASTM D746 @ -55°C (-67°F)																																													
	ASTM D2137 @ -62°C (-80°F)	Pass	Pass	Pass	Pass	Pass	Pass																	ASTM D2137 @ -62°C (-80°F)																																													
Electric																							Electric																																														
Dielectric Strength (Volts/mil)	ASTM D149	48	72	65	75	66	57	17	Pass							Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	ASTM D149																																											
Dielectric Constant (1 kHz)	ASTM D150	1.096	1.214	1.056	1.34	1.335	1.467							372	374	381	386	344		284	58	55	64	ASTM D150																																													
Dissipation Factor (1kHz)	ASTM D150	0.003	0.003	0.001	0.006	0.003	0.005							2.76	2.97	2.95	2.76	5.64		4.56	1.46	1.6	1.42	ASTM D150																																													
Dry Arc Resistance (Seconds)	ASTM D495	85.8	123.2	124.7	124.8	173.5	148.9	2						121.7	122.7	145	124.2	187.8		189.6	207.7	99	185.3	ASTM D495																																													
Volume Resistivity (Ohm-cm)	ASTM D257	10^13	10^16	10^13	10^14	10^14	10^14	10^13						10^14	10^14	10^14	10^14	10^13		0.2	10^14	10^14	10^16	10^13	ASTM D257																																												
EMI Shielding (dB)	MIL G83528																							MIL G83528																																													
Acoustic																							Acoustic																																														
Sound Transmission (dB)	ASTM E90																							ASTM E90																																													

TIPS FOR MATERIAL SELECTIONS
SPECIALTY SERVICES

Options

- // Acrylic one or two sides of material
- // Silicone one side only

Material Slitting

- // Ability to slit minimum width of 6.35 mm (0.250")
- // Width of slit must be greater or equal to thickness
- // Material can be slit with or without adhesive applied
- // Maximum roll diameter is 355.6 mm (14")

Applications Aerospace Communications Rail Automotive Energy Lighting

Applications	Aerospace	Communications	Rail	Automotive	Energy	Lighting
Flame, Smoke & Toxicity	●×	●×	●×	●×	●×	●×
UL Rated Material		●×			●×	●×
Vibration Reduction	●×	●×	●×	●○×	●○×	
Acoustic Performance	●×		●×	●○×		
Softness	●○×	●○×	●○×	●○×	●○×	●○×
Firmness	●○×	●○×	●○×	●○×	●○×	●○×
EMI Shielding		×				
Moisture Resistant	●○×	●○×	●○×	●○×	●○×	●○×
Heat Shielding	×	×	×	×	×	×
Insulating		●	●	●	●	●

LEGEND

- BISCO Cellular Silicones
- BISCO Solid Silicones
- × BISCO Specialty Silicones

DESIGN TOOLS

Product Properties Guide

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

Filters
 // Groups: Flammability and Outgassing
 // Product Category: Silicone Materials

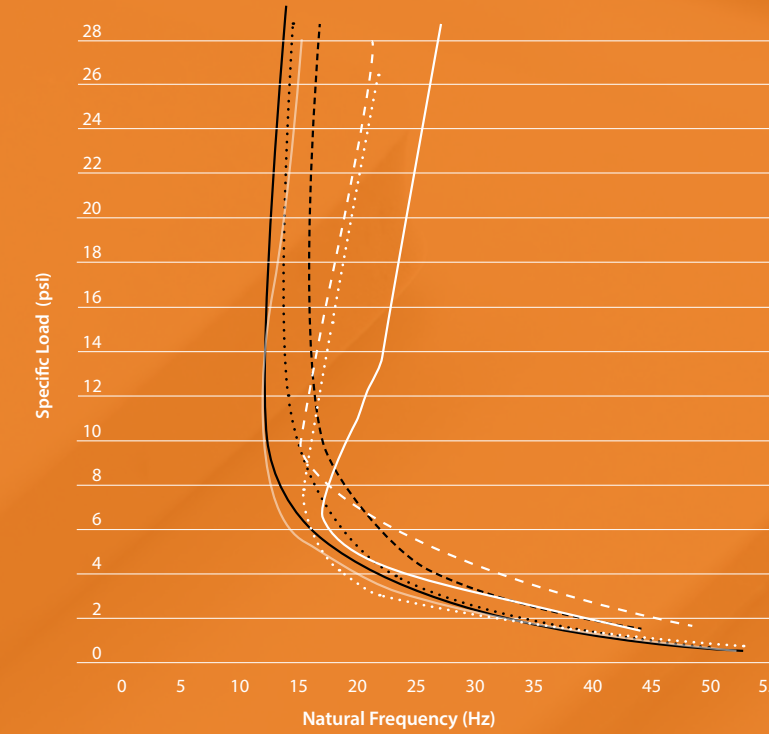
Product	Results					
	BF-2000	BF-1000	HT-870	HT-800	HT-820	HT-840
Flamability and Outgassing						
UL94 V-0 (Pass/Fail)	Pass	Pass	Pass	Pass	Pass	Pass
UL94 HF-1 (Pass/Fail)	Pass	Pass	Pass	Pass	Pass	Pass
Burn Rate FMVSS302 (Pass/Fail)	Pass	Pass	Pass	Pass	Pass	Pass
Flame Resistance @ 12 Sec FAR 25.853 (Pass/Fail)	Pass	Pass	Pass	Pass	Pass	Pass
Flame Resistance @ 60 Sec FAR 25.853 (Pass/Fail)	Pass	Pass	Pass	Pass	Pass	Pass
Smoke Density (D _s) @ 1.5 min ASTM E 662	<100	<100	<100	<100	<100	<100
Smoke Density (D _s) @ 4.0 min ASTM E 662	<200	<200	<200	<200	<200	<200
Toxic Gas Emissions Rating SMP-800C (Pass/Fail @ 1.5/4.0 min)	Pass	Pass	Pass	Pass	Pass	Pass
Total Mass Loss ASTM E 595 (%)	3.81	3.46	1.19	0.98	2.11	2.08
Collected Volatile Condensable Materials ASTM E 595 (%)	1.14	1.12	0.34	0.25	0.63	0.57
Water Vapor Regain ASTM E595 (%)	0.07	0.04	0.02	0.03	0.02	0.01



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 specifications to calculate the isolation efficiency of our materials, and provides the most effective material option.

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

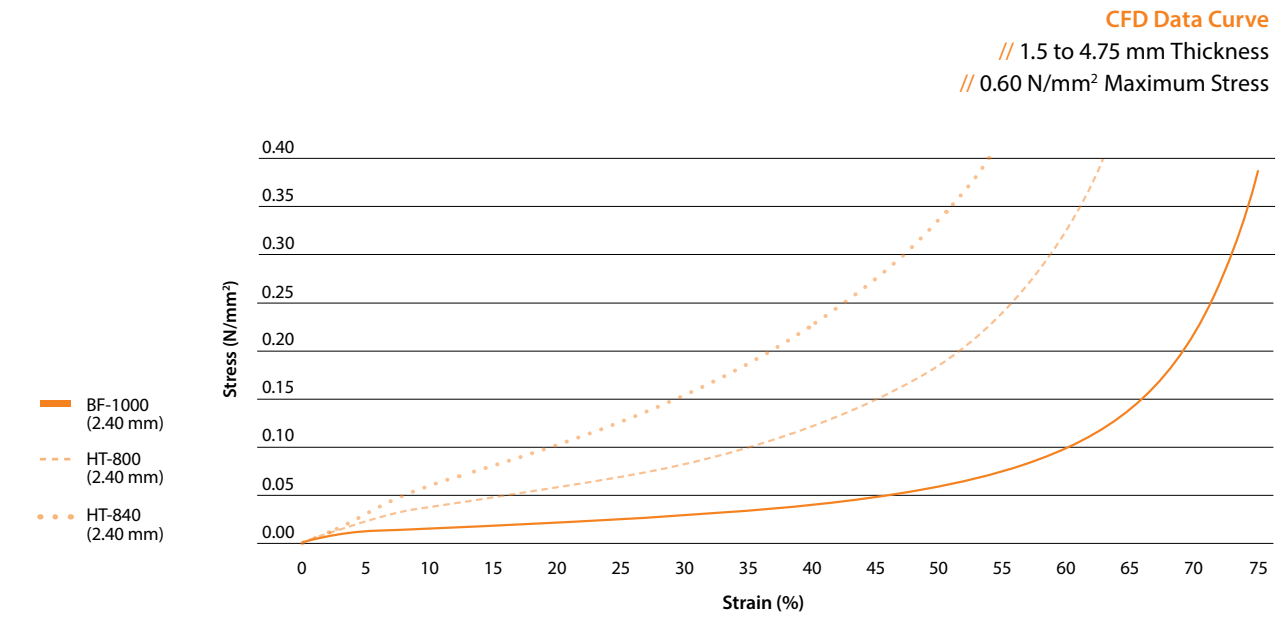


Product	BISCO® Silicones			PORON® Polyurethanes			
	HT-800	L3-XX40	L3-XX40	40-15500	41-15500	50-15500	37-14500
Thickness mm (in)	12.70 (0.500)	12 (0.472)	16 (0.630)	12.70 (0.500)	12.70 (0.500)	12.70 (0.500)	12.70 (0.500)
Isolation Efficiency (%)	> 97.00	> 94.00	> 94.00	> 97.00	> 96.00	> 95.00	> 94.00
Natural Frequency (Hz)	12	17	15	19	12	16	16



Compression Force Deflection (CFD) Tool

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



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® Dura-Shape® Foams

BISCO® Silicones
 // BISCO® HT-800

Configuration
 // Application: EV/HEV Battery Pads & Cushions
 // 5.1 - 15.0 mm Thickness
 // Medium Compressibility



STANDARDS

Industry	Standard
Aerospace	ABS 5006
	ABS 5026
	ABS 5708
	ABS 5789
	AIMS04-14-002A
	AMS 3195
	AMS 3196
	BMS 1-23
	BMS 1-60
	BMS 1-68
	CMS-RB-202
	CMS-RB-209
Automotive	DMS 1980 GR2 CL2
	DMS 1980 GR1 CL1
	DMS 1980 GR1 CL2
	DMS 1980 GR3 CL1
	DMS 1980 GR 3 CL2
Chrysler MS-AY556	
GMW16392	
Rogers Internal	BISCO Standard
Food/Medical	FDA
	21 CFR 177.2600
Rail	49 CFR 238
	BS6853
	DIN5510
	EN 45545
	NFF16-1014
NFPA 130	
UL	UL 50
	UL 50E
	UL 157
	UL 508
	UL 1598

APPLICATIONS

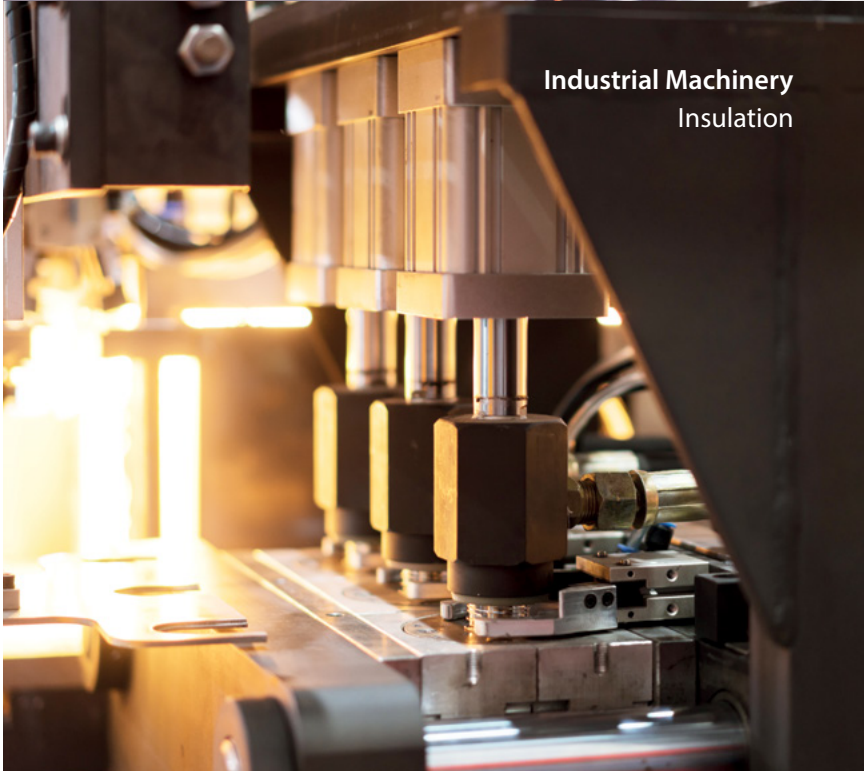
Gaskets
Heat Shields
Seals
Cushioning
Insulation
Floating Floors

and more ...

Airplane
Cushioning



Industrial Machinery
Insulation



Automotive
Heat Shields



For more information please visit us at:
www.rogerscorp.com/ems/bisco/index.aspx



For more information visit 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

North America

Elastomeric Material Solutions
BISCO Silicone Foams
Carol Stream, IL, USA
Tel: 630.784.6200
Fax: 860.928.3906
Toll Free: 800.935.2940
solutions@rogerscorp.com

Rogers Taiwan, Inc.
New Taipei City, Taiwan
Tel: 886.2.8660.9056
Fax: 886.2.8660.9057

Rogers Technologies Singapore Inc.
Singapore
Tel: 65.6747.3521
Fax: 65.6747.7425

Europe

Rogers BVBA
Evergem, Belgium
Tel: 32.9.2353611
Fax: 32.9.2353658

Rogers Technologies, Co.
Shanghai, China
Tel: 86.21.6217.5599
Fax: 86.21.6267.7913

Asia

Rogers Japan, Inc.
Tokyo, Japan
Tel: 81.3.5200.2700
Fax: 81.3.5200.0571

Rogers Technologies, Co.
Shenzhen, China
Tel: 86.755.8236.6060
Fax: 86.755.8236.6123

Rogers Korea, Inc.
Gyonggido, Korea
Tel: 82.31.360.3622
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.