
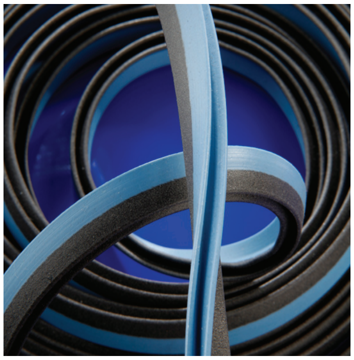

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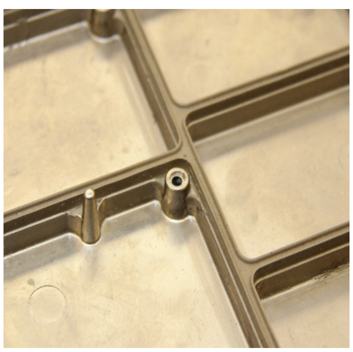
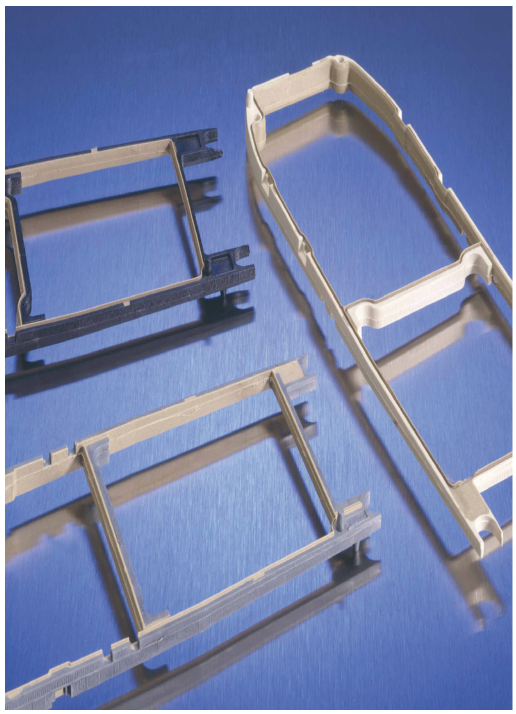
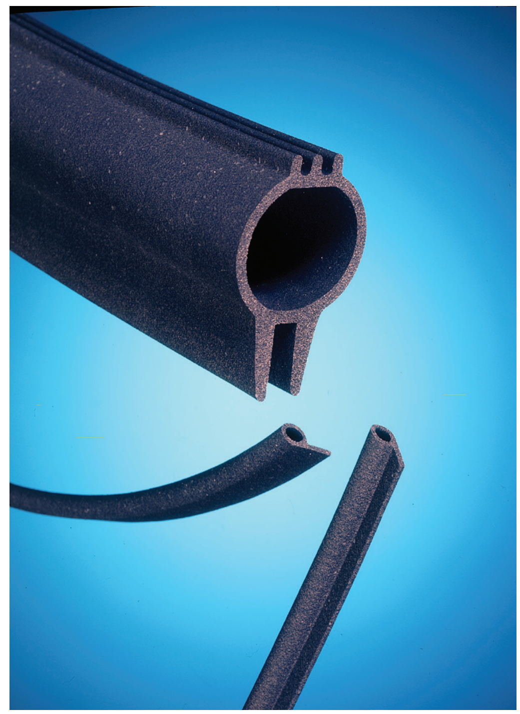




Conductive Elastomer EMI Gaskets

Molded and Extruded Materials Selection Guide

Authorized Distributor
K. R. Anderson, Inc.
www.krafab.com
408-825-1900

ENGINEERING YOUR SUCCESS.

EMI Materials

INTRODUCTION

CONDUCTIVE ELASTOMER SELECTION GUIDE

Tables 5a and 5b contained herein provide selection guidelines for Chomerics' most general-purpose EMI elastomer materials. With the exception of certain limitations noted under "Remarks", these materials are electrically stable over time and provide excellent moisture and pressure sealing. They are all medium-durometer materials and differ mainly in shielding performance and corrosion resistance. (Nickel-plated aluminum materials are significantly more corrosion-resistant than silver-plated copper, silver-plated aluminum, and silver-plated nickel filled materials against aluminum.)

- Availability
- Design Flexibility
- Cost Effectiveness
- Proven Performance

...just four of the reasons why conductive elastomer gaskets are so often the right EMI shielding solution!

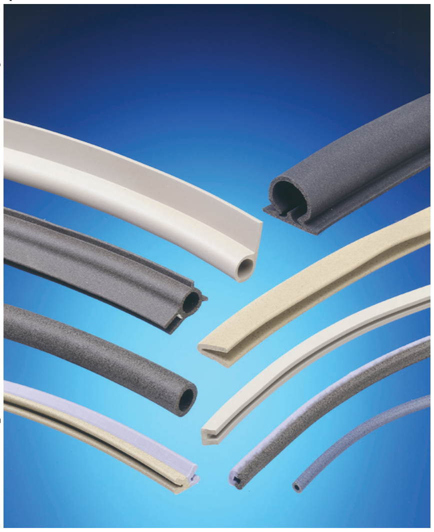
Once used mainly to shield critical defense and aerospace electronic systems, Parker Chomerics conductive elastomers have become the progressive choice for packaging designers of consumer, telecommunications, business, industrial equipment, automotive, medical devices and much more.

Conductive elastomers are reliable over the life of the equipment. The same gasket is both an EMI shield and an environmental seal. Elastomer gaskets resist compression set, accommodate low closure force, and help control airflow. They're available in corrosion-resistant and flame-resistant grades. Their aesthetic advantages are obvious.

Almost any elastomer profile can be extruded or custom-molded with modest tooling costs and short lead times for either prototypes or large orders. Parker Chomerics can also take a customer-supplied design and deliver finished parts. Parker Chomerics offers hundreds of standard molded and extruded products. Molded products provide moisture/pressure sealing and EMI/EMP shielding when compressed properly in seals, flanges, bulkheads, and other assemblies. Extrusions provide similar benefits and are also readily lathe-cut into washers, spliced, bonded, kiss-cut, or die-cut to reduce installation labor and to conserve material, resulting in a cost-effective alternative to other methods of EMI shielding and environmental sealing.

CHO-SEAL® CONDUCTIVE ELASTOMERS

Over the years, Parker Chomerics has developed and enhanced virtually every aspect of conductive elastomer materials technology, from the earliest silver and silver-plated copper filled silicones, to the latest and more cost-effective nickel-plated aluminum and nickel-plated graphite composites. Today we offer the most comprehensive selection and highest quality products available.



Each conductive elastomer consists of a silicone, fluorosilicone, EPDM or fluorocarbon-fluorosilicone binder with a filler of pure silver, silver-plated copper, silver-plated aluminum, silver-plated nickel, silver-plated glass, nickel-plated graphite, nickel-plated aluminum or unplated graphite particles. The development of these composites is the result of decades of research and testing, both in the laboratory and in the field. Our proprietary filler powder technology allows us to carefully control the composition, size, and morphology of the conductive particles. Their precise, uniform dispersion within the resinous binders produces materials with stable and consistent electrical and physical properties.

Parker Chomerics' conductive elastomers feature excellent resistance to compression set over a wide temperature range, resulting in years of continuous service. In addition to EMI shielding, these materials can provide an environmental or pressure seal if required.

For those materials containing silver, both packaging and storage conditions should be similar to those for other silver-containing components, such as relays or switches. They should be stored in sheet plastic, such as polyester or polyethylene, and kept away from sulfur-containing materials, such as sulfur-cured neoprene, cardboard, etc. To remove dirt, clean the elastomer with water or alcohol containing mild soap (do not use aromatic or chlorinated solvents). **Shelf life of these conductive elastomers without the presence of pressure sensitive adhesive (PSA) is indefinite. Shelf life of the PSA is 12 months from date of manufacture. Refer to page 30 for Applications detailed guidance on PSA systems.**

Tables 6 and 7 outline the properties and specification limits of Parker Chomerics' conductive elastomers. These materials are produced in a virtually unlimited variety of molded, die-cut and extruded shapes and sizes. Our Applications Engineering Department is very accessible, and ready to assist with material selection and gasket design. We welcome your inquiry.

MATERIAL SELECTION

The Parker Chomerics array of conductive elastomers offers true flexibility in selecting the appropriate material for a specific application on the basis of cost and level of attenuation required. Price varies directly with shielding performance.

For some military/aerospace applications, users of conductive elastomer gaskets consider specifying materials that meet MIL-DTL-83528 where appropriate but note that newer materials may not yet be included in that specification, e.g., nickel-plated aluminum filled elastomers. To avoid the risk of system EMI or environmental seal failure, any change in conductive elastomer seal supplier (including MIL-DTL-83528 QPL suppliers) should be preceded by thorough system qualification testing.

UL 94 V-0 RATED MATERIALS

Chomerics introduced the first conductive elastomer gasket material with a UL 94 V-0 rating.

Since that time, Chomerics now has a selection of UL 94 V-0 rated gasket materials including CHO-SEAL 6370, 6371, 1273, S6305 and 1310.

CHO-SEAL gasket materials are rated at UL 94 V-0 down to a thickness of 0.013 Inch (0.33 mm). Actual thickness for each certified material, and specific conditions of use can be found in UL File #OCDT2.E140244 under Insulating Devices and Materials – Components. CHO-SEAL materials certified by UL for use in Canada can be found in UL File OCDT8.E140244. For UL Certification files, please visit www.ul.com.

Conductive Elastomer Applications

In general, certain types of Parker's conductive elastomers are specified more often for military/aerospace applications or for commercial applications. However, there is a considerable overlap, and our Applications Engineering department will be pleased to assist you with your product selection.

ELASTOMER PRODUCT OFFERING

Military and Commercial Products

CHO-SEAL

6502
6503 – Fluorosilicone
1298 – Fluorosilicone
1285
1287 – Fluorosilicone
1215
1217 – Fluorosilicone
S6305

6370 – Extruded only
6371 – Molded only

6308 – Extruded Only

6330 – Molded Only

L6303 – Fluorosilicone

1350

1310 – Molded Only
1273
1270 – Molded Only

Specialty Products

CHO-SEAL

1224 - Molded Only

1221 – Fluorosilicone, Molded Only

S6600 – Molded Only

1401
1239 - Molded Only
1212 – Molded Only
6435 – Molded Only
6307 – Molded Only
6452 – Extruded Only
6460 – EPDM , Molded Only
V6433 – Molded Only

Refer to ttables 6 and 7 for specific material properties and material guidelines.

Gasket Selection

In the early 1960s, Chomerics invented CHO-SEAL® 1215, an electrically conductive elastomeric gasket specifically designed to address progressive requirements within the Electromagnetic Interference and Electromagnetic Compatibility (EMI/EMC) marketplace. This revolutionary gasket material, consisting of silver plated copper particles dispersed within a silicone resin system provided a gasket capable of offering both electromagnetic shielding and a degree of environmental protection. . In the early 1980s Chomerics changed the market with the development of CHO-SEAL 1285, a silver plated aluminum filled silicone material which provided improved environmental protection with increased corrosion resistance. In the early 90's, Chomerics released CHO-SEAL 1298, a passivated silver plated aluminum fluorosilicone which again, further advance conductive elastomer technology in the area of environmental protection. Now, with the recent release of the nickel aluminum particle filled series of conductive elastomers, Chomerics has once again revolutionized the conductive elastomer gasket market with the development of CHO-SEAL 6502 and 6503 nickel-aluminum filled conductive elastomers.

The CHO-SEAL nickel-plated aluminum (Ni/Al) filled materials have been proven to simultaneously provide the best corrosion resistance (per CHO-TM101), and the highest degree of shielding effectiveness (Per CHO-TP09/IEEE STD 299) after long term aging tests of any EMI shielding elastomer gasket material. Ni/Al particles have also proven to have a lower transfer impedance (Per CHO-TM-TP10/ SAE ARP 1705) than conductive elastomers comprised of other fillers. Chomerics new material types designated as CHO-SEAL 6502 and CHO-SEAL 6503 are Silicone and Fluorosilicone elastomers respectively.

The combination of nickel and aluminum within the filler are inherently stable and have the best galvanic compatibility with chem filmed aluminum flanges which results in optimum durability and stability. Nickel-plated aluminum particle filled elastomers provide the lowest amount of flange pitting due to galvanic corrosion. CHO-SEAL Ni/Al materials reduce flange pitting on all chromate treated flanges as compared to Ag/Al filled materials by 20 to 50%.

That being said, silver-bearing elastomers can still be a viable solution. A common misconception is that all silver-bearingconductive elastomers behave galvanically as silver. Experiments designed to show the galvanic effects of silver-filled elastomer gaskets on aluminum flanges have shown them to be far less corrosion than predicted. Silver-plated-aluminum filled elastomers exhibit the least traces of galvanic corrosion. (See Table 1).

Tables of galvanic potential do not accurately predict the corrosivity of metal-filled conductive elastomers because of the composite nature of these materials. Also, these tables do not measure directly two important aspects of conductive elastomer "corrosion resistance": 1) the corrosion of the mating metal flange and 2) the retention of conductivity by the elastomer after exposure to a corrosive environment which is necessary for EMI shielding and grounding. Instead of using a table of galvanic potentials, the corrosion caused by different conductive elastomers was determined directly by measuring the weight loss of a T6061-T6 grade aluminum coupon in contact with the conductive elastomer (after exposure to a salt fog environment)

The electrical stability of the elastomer was determined by measuring its volume resistivity per CEPS-0002 before and after exposure. This galvanic corrosion tests were performed in accordance with Chomerics Test Method CHO-TM101.

Table 1: Corrosion Potentials for Metals and Gasket Materials

Corrosion Potentials of Various Metals and EMI Gasket Materials (in 5% NaCl at 21°C, after 15 minutes immersion)	
Material	**E_{corr} vs. SCE* (Millivolts)**
Pure Silver	–25
Silver-filled elastomer	–50
Monel mesh	–125
Silver-plated-copper filled elastomer	–190
Silver-plated-aluminum filled elastomer	–200
Copper	–244
Nickel	–250
Tin-plated Beryllium-copper	–440
Tin-plated copper-clad steel mesh	–440
Aluminum* (1100)	–730
Silver-plated-aluminum filled elastomer (die-cut edge)	–740

*Standard Calamel Electrode. Aluminum Alloys approximately –700 to –840 mV vs. SCE in 3% NaCl. Mansfield, F. and Kenkel, J.V., "Laboratory Studies of Galvanic Corrosion of Aluminum Alloys," Galvanic and Pitting Corrosion – Field and Lab Studies, ASTM STP 576, 1976, pp. 20-47.

Table 2a: 168 Hour Typical Elastomers-Galvanic Compatibility Exposure to Salt Spray / Salt Fog					
Substrate	**Filler**				
	Nickel-Plated Aluminum*	**Passivated Silver-Plated Aluminum**	**Silver-Plated Aluminum**	**Nickel-Plated Graphite**	**Silver-Plated Copper**
Aluminum: 6061-T6 Conversion Coated Type I, Class 3 Finish (Hexavalent)	Excellent	Excellent	Excellent / Good	Fair	Poor
Aluminum: 6061-T6 Conversion Coated Type II, Class 3 Finish (Trivalent)	Excellent	Excellent	Good	Fair	Poor
Aluminum: 6061-T6 Unplated	No Data	Good	Fair	Fair / Poor	Not Recommended
Stainless Steel: 304SS, 316SS	Excellent	Excellent	Excellent	Excellent	No Data
Electroless Nickel .002" thick	Good	Good	Good	Poor	No Data
Magnesium	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Table 2b: 504 Hour Typical Elastomers-Galvanic Compatibility Exposure to Salt Spray / Salt Fog					
Aluminum: 6061-T6 Conversion Coated Type I, Class 3 Finish (Hexavalent)	Excellent	Good	Fair	Poor	Not Recommended
Aluminum: 6061-T6 Conversion Coated Type II, Class 3 Finish (Trivalent)	Good	Good	Fair	Poor	Not Recommended

The reader should take note that this evaluation was set up to create a harsh exposure evaluation in a corrosive environment – NOT – an evaluation to maximize shielding effectiveness. Following recommended EMI gasket design guidelines for corrosive environments will produce significantly greater shielding effectiveness test results. See section on Design Guides for Corrosion Control above.

Inclusion of test data for all materials within this catalog is not practical, nor necessary to support this conclusion. The shielding effectiveness curves shown herein are a composite of results taken over several months of testing on a variety of gasket materials, flange treatments and environmental exposure conditions. This information, and further specifics on the test data/methods can be found in the Test Reports found online at www.Parker.com/Chomerics in Tech Info, under Test Reports.

Choosing the right EMI conductive gasket requires knowledge of both electrical and mechanical requirements. Shear forces, environmental effects, compression set, method of application and pricing are just some of the factors influencing choice of gasket which is best for a particular application. Materials must be both cost-effective as well as ensuring equipment and system compliance with Military and Commercial EMI/EMC test requirements and environmental test requirements. In order to help ensure a successful equipment and/or system test cycle why not start by designing in the best gasket available to help get you there – Chomerics CHO-SEAL 6502/6503.

Fluid Resistance

Table 3 below illustrate the change in physical properties of CHO-SEAL S6305 (nickel-graphite filled silicone) after exposure to a variety of common household fluids.

Table 4 lists a qualitative assement of temperature and harsh fluid resistance by unfilled elastomer type. It's important to note that these are typical properties of an unfilled elastomer. In all cases, the customer is encouraged to evaluate specific CHO-SEAL materials to the requirements demanded by the application.

Table 3: Gasket Materials Eposure to Common Fluids.

Exposure of CHO-SEAL® S6305 to Common Household Fluids Tensile/Elongation in accordance with ASTM D412				
Exposure Conditions: 70 hours @ 22°C/50% RH		**Pre-Exposure**	**Pre-Exposure**	**% Change**
ClearVue®	Tensile [psi]	200	178	-11%
	Elongation [%]	289	317	10%
Formula 409®	Tensile [psi]	200	197	-2%
	Elongation [%]	289	219	-24%
Windex®	Tensile [psi]	200	202	1%
	Elongation [%]	289	166	-43%
Carpet Cleaner	Tensile [psi]	203	207	2%
	Elongation [%]	414	443	7%
Coffee	Tensile [psi]	203	211	4%
	Elongation [%]	414	439	6%
Cola	Tensile [psi]	203	199	-2%
	Elongation [%]	414	433	5%
Hairspray	Tensile [psi]	203	207	2%
	Elongation [%]	414	326	-21%
Tire Cleaner	Tensile [psi]	203	175	-14%
	Elongation [%]	414	418	1%
Vinyl Protectant	Tensile [psi]	203	172	-15%
	Elongation [%]	414	433	5%
Tap Water	Tensile [psi]	203	199	-2%
	Elongation [%]	414	439	6%
Windshield Washer Solvent	Tensile [psi]	203	207	2%
	Elongation [%]	414	418	1%

Table 4: Gasket Material Exposure to Temperature and Harsh Fluids.

Typical Elastomer Fluid Resistance			
Exposure/Fluid	**Elastomer Choice**		
	Silicone	**Fluorosilicons**	**EPDM**
High Temp	Excellent	Good	Fair
Low Temp	Excellent	Excellent	Excellent
ASTM 1 Oil	Fair/Good	Good	Poor
Hydraulic Fluids (Phosphate Ester)	Poor	Poor	Good
Hydrocarbon Fuels	Poor	Good	Poor
Ozone, Weather	Good	Good	Good
STB (NBC Decontamination Fluid)	Poor	Fair/Good	Good
Dilute Acids	Fair	Good	Good

Elastomer Binder Legend

Silicone | Fluorosilicone | EPDM | Fluorocarbon/ Fluorosilicone

Shielding and Corrosion Performance

Fair ○ | Good ○○ | Very Good ○○○○ | Excellent ○○○○○○

Table 5a: Quick Reference Guide for Selecting Conductive Elastomers - Typical Commercial and Military Applications
(M) = Molded only, (E) = Extruded only

Material	Filler	Binder	Shielding	Corrosion (on Aluminum)	MIL-DTL-83528
CHO-SEAL 6502	Nickel-Aluminum	Silicone	○○○○○	○○○○○	-----
CHO-SEAL 6503	Nickel-Aluminum	Fluorosilicone	○○○○○	○○○○○	-----
CHO-SEAL 1298	Silver-Aluminum	Fluorosilicone	○○○	○○○○	Type D
CHO-SEAL 1285	Silver-Aluminum	Silicone	○○○○	○○○	Type B
CHO-SEAL 1287	Silver-Aluminum	Fluorosilicone	○○○	○○○	Type D
CHO-SEAL 1215	Silver-Copper	Silicone	○○○○○	○	Type A
CHO-SEAL 1217	Silver-Copper	Fluorosilicone	○○○○○	○	Type C
CHO-SEAL S6305	Nickel-Graphite	Silicone	○○○	○○	-----
CHO-SEAL 6370	Nickel-Graphite	Silicone	○○	○○	-----
CHO-SEAL 6371	Nickel-Graphite	Silicone	○○	○○	-----
CHO-SEAL 6308	Nickel-Graphite	Silicone	○○○	○○	-----
CHO-SEAL 6330 (E)	Nickel-Graphite	Silicone	○	○○	-----
CHO-SEAL L6303	Nickel-Graphite	Fluorosilicone	○○○	○○	-----
CHO-SEAL 1350	Silver-Glass	Silicone	○○○○	○	Type M*
CHO-SEAL 1310 (M)	Silver-Glass	Silicone	○○○	○	-----
CHO-SEAL 1273	Silver-Copper	Silicone	○○○○	○	-----
CHO-SEAL 1270 (M)	Silver-Copper	Silicone	○	○	-----

* **Molded** version of 1350 meets Mil-DTL-83528 type M specifications. **Extruded** version of 1350 meets Mil-DTL-83528 type M specifications except elongation (60/260).

Table 5b: Quick Reference Guide for Selecting Conductive Elastomers - Specialty Elastomers
(M) = Molded only, (E) = Extruded only

Material	Filler	Binder	Shielding	Corrosion (on Aluminum)	MIL-DTL-83528
CHO-SEAL 1224 (M)	Silver	Silicone	○○○○○○	○	Type E
CHO-SEAL 1221 (M)	Silver	Fluorosilicone	○○○○○○	○	Type F
CHO-SEAL 1401	Silver	Silicone	○○○○	○	Type J
CHO-SEAL 1239 (M)	Silver-Copper	Silicone/Cu Mesh	○○○○	○	Type G
CHO-SEAL 1212 (M)	Silver-Copper	Silicone	○○○○○	○	Type K
CHO-SEAL 6435 (M)	Silver-Nickel	EPDM	○○○	○○○	-----
CHO-SEAL 6307 (M)	Nickel-Graphite	EPDM	○○	○○○	-----
CHO-SEAL 6452 (E)	Nickel-Graphite	EPDM	○○○	○○○○	-----
CHO-SEAL 6460 (M)	Nickel-Aluminum	EPDM	○○○○	○○○○○	-----
CHO-SEAL V6433 (M)	Silver-Nickel	Fluoro/Fluorocarbon	○○○	○○○	-----
CHO-SEAL S6600 (M)	Carbon	Silicone	○	○	-----

Elastomer Binder Legend

Silicone | Fluorosilicone | EPDM | Fluorocarbon/ Fluorosilicone

Elastomer Filler Legend

Corrosion Resistant on Aluminum

Table 6: Material Guidelines - Military and Commercial								
		Test Procedure (Type of Test)	CHO-SEAL 6502	CHO-SEAL 6503	CHO-SEAL 1298	CHO-SEAL 1285	CHO-SEAL 1287	CHO-SEAL 1215
Physical	Molded (M) or Extruded (E)	--	M/E	M/E	M/E	M/E	M/E	M/E
Physical	Conductive Filler	--	Ni/Al	Ni/Al	Passivated Ag/Al	Ag/Al	Ag/Al	Ag/Cu
Physical	Elastomer Binder	--	Silicone	Fluorosilicone	Fluorosilicone	Silicone	Fluorosilicone	Silicone
Physical	Type (Ref. MIL-DTL-83528)	--	Not Applicable	Not Applicable	Type D	Type B	Type D	Type A
Physical	Volume Resistivity, ohm-cm, max., as supplied without pressure sensitive adhesive	CEPS-0002[C] (Q/C)	0.150	0.250	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Physical		MIL-DTL-83528 (Q/C)	Not Applicable	Not Applicable	0.012	0.008	0.012	0.004
Physical	Hardness, Shore A	ASTM D2240 (Q/C)	68 ±10	72 ±10	70 ±7	65 ±7	70 ±7	65 ±7
Physical	Specific Gravity	ASTM D792 (Q/C)	1.85 ± 0.25	2.05 ± 0.25	2.00 ± 0.25	2.00 ± 0.25	2.00 ± 0.25	3.50 ±0.45
Physical	Tensile Strength, psi (MPa), min.	ASTM D412 (Q/C)	150 (1.03)	150 (1.03)	180 (1.24)	200 (1.38)	180 (1.24)	200 (1.38)
Physical	Elongation, % min. or % min./max.	ASTM D412 (Q/C)	100 min	50 min	60/260	100/300	60/260	100/300
Physical	Tear Strength, lb/in. (kN/m), min.	ASTM D624 (Q)	40 (7.00)	35 (6.13)	35 (6.13)	30 (5.25)	35 (6.13)	40 (7.00) / 25 (4.38)
Physical	Compression Set, 70 hrs at 100°C, % max. (A)	ASTM D395, Method B (Q)	30	30	30	32	30	32
Thermal	Low Temperature Flex TR10, °C, min.	ASTM D1329 (Q)	-55	-55	-55	-65	-55	-65
Thermal	Maximum Continuous Use Temperature, °C (B)	--	125	125	160/200	160/200	160/200	125
Thermal	Thermal Conductivity, W/m-K (Typical) 300 psi (2.07 MPa)	ASTM D5470	1.0	0.9	1.2	2.2	Not Tested	2.1
Electrical	Shielding Effectiveness, dB, min. (F)	Method 1: CHO-TP08[C] (Q) Method 2: MIL-DTL-83528 Para. 4.5.12 (Q) Method 3: CHO-TP09[C] (Q)	Method 2	Method 2	Method 2	Method 2	Method 2	Method 2
Electrical	200 kHz (H Field)		Not Tested	Not Tested	55	60	55	70
Electrical	100 MHz (E Field)		127	127	110	115	110	120
Electrical	500 MHz (E Field)		115	117	100	110	100	120
Electrical	2 GHz (Plane Wave)		116	116	95	105	95	120
Electrical	10 GHz (Plane Wave)		127	127	90	100	90	120
Electrical	40 GHz (Plane Wave)		Not Tested		75	Not Tested	75	90
Electrical Stability, ohm-cm, max.	Heat Aging	CEPS-0002[C] (Q)	0.200 (H)	0.250 (H)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Electrical Stability, ohm-cm, max.	Heat Aging	MIL-DTL-83528 Para. 4.5.15 (Q/C)	Not Applicable	Not Applicable	0.015	0.010	0.015	0.010
Electrical Stability, ohm-cm, max.	Resistance During Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	Not Applicable	Not Applicable	0.015	0.012	0.015	0.004
Electrical Stability, ohm-cm, max.	Resistance After Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	Not Applicable	Not Applicable	0.012	0.008	0.012	0.008
Electrical Stability, ohm-cm, max.	Post Tensile Set Volume Resistivity	MIL-DTL-83528 Para. 4.5.9 (Q/C)	Not Applicable	Not Applicable	0.015	0.015	0.015	0.008
Regulatory	EMP Survivability, kA per in. perimeter	MIL-DTL-83528 Para. 4.5.16 (Q)	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9
Regulatory	RoHS Compliant	--	Yes	Yes	Yes	Yes	Yes	Yes
Regulatory	UL 94 Flammability Rating	UL 94	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested

Note A: Compression set is expressed as a percentage of deflection per ASTM D395 Method B, at 25% deflection. To determine percent recovery, subtract 0.25 of the stated compression set value from 100%. For example, in the case of 30% compression set, recovery is 92.5%.
Note B: Where two values are shown, the first represents max. operating temp. for conformance to MIL-DTL-83528 (which requires Group A life testing at 1.25 times max. operating temp.) and the second value represents the practical limit for ex posure up to 1000 hrs. (compressed between flanges 7-10%). Single values conform to both definitions.
Note C: Copies of CEPS-0002, CHO-TP08 and CHO-TP09 are available from Chomerics. Contact Applications Engineering.
Note D: Heat aging condition: 100°C for 48 hrs.
Note E: Heat aging condition: 150°C for 48 hrs.
Note F: It may not be inferred that the same level of shielding effectiveness provided by a gasket material tested in the fixture per MIL-DTL-83528 Para. 4.5.12 would be provided in an actual equipment flange, since many mechanical factors of the flange design (tolerances, stiffness, fastener location and size, etc.) could lower or enhance shielding effectiveness. This procedure provides data applicable only to the test fixture design of MIL-DTL-83528, but which is useful for making comparisons between different gasket materials. The 40 GHz test data for all materials uses TP08 test method.
Note G: Heat aging condition: 200 °C for 48 hours
Note H: Heat aging condition: 125 °C for 1000 hours

continued on next page...

Elastomer Binder Legend

Silicone | Fluorosilicone | EPDM | Fluorocarbon/ Fluorosilicone

Elastomer Filler Legend

Corrosion Resistant on Aluminum

continued...Table 6: Material Guidelines - Military and Commercial - *continued*								
		Test Procedure (Type of Test)	CHO-SEAL 1217	CHO-SEAL S6305	CHO-SEAL 6370	CHO-SEAL 6371	CHO-SEAL 6308
Physical	Molded (M) or Extruded (E)	--	M/E	M/E	E	M	E
	Conductive Filler	--	Ag/Cu	Ni/C	Ni/C	Ni/C	Ni/C
	Elastomer Binder	--	Fluorosilicone	Silicone	Silicone	Silicone	Silicone
	Type (Ref. MIL-DTL-83528)	--	Type C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Volume Resistivity, ohm-cm, max., as supplied without pressure sensitive adhesive	CEPS-0002[c] (Q/C)	Not Applicable	0.100	0.100	0.100	0.100
		MIL-DTL-83528 (Q/C)	0.010	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Hardness, Shore A	ASTM D2240 (Q/C)	75 ±7	65 ±10	60 ±10	65 ±10	65 ±10
	Specific Gravity	ASTM D792 (Q/C)	4.00 ± 0.50	2.00 ± 0.25	2.10 ± 0.25	2.00 ± 0.25	2.00 ± 0.25
	Tensile Strength, psi (MPa), min.	ASTM D412 (Q/C)	180 (1.24)	200 (1.38)	150 (1.03)	150 (1.03)	200 (1.38)
	Elongation, % min. or % min./max.	ASTM D412 (Q/C)	100/300	100	100	100	75
	Tear Strength, lb/in. (kN/m), min.	ASTM D624 (Q)	35 (6.13)	50 (8.75)	35 (6.13)	Not Tested	40 (7.00)
	Compression Set, 70 hrs at 100°C, % max. [(A)]	ASTM D395, Method B (Q)	35	30	40	40	30
Thermal	Low Temperature Flex TR10, °C, min.	ASTM D1329 (Q)	-55	-45	-45	-40	-60
	Maximum Continuous Use Temperature, °C [(B)]	--	125	150	150	150	150
	Thermal Conductivity, W/m-K (Typical) 300 psi (2.07 MPa)	ASTM D5470	Not Tested	0.8	0.9	1.1	Not Tested
Electrical	Shielding Effectiveness, dB, min. [(F)]	Method 1: CHO-TP08[C] (Q) Method 2: MIL-DTL-83528 Para. 4.5.12 (Q) Method 3: CHO-TP09[C] (Q)	Method 2	Method 1	Method 1	Method 1	Method 1
	200 kHz (H Field)		70	Not Tested	Not Tested	Not Tested	Not Tested
	100 MHz (E Field)		120	100	100	100	100
	500 MHz (E Field)		120	100	100	100	100
	2 GHz (Plane Wave)		115	100	95	80	100
	10 GHz (Plane Wave)		110	100	95	80	100
	40 GHz (Plane Wave)		Not Tested	75	Not Tested	Not Tested	Not Tested
	Electrical Stability, ohm-cm, max. — Heat Aging	CEPS-0002[c] (Q)	Not Applicable	0.250[e]	0.250[(e)]	0.250[(e)]	0.250[e]
		MIL-DTL-83528 Para. 4.5.15 (Q/C)	0.015	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Resistance During Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	0.010	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Resistance After Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	0.015	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Post Tensile Set Volume Resistivity	MIL-DTL-83528 Para. 4.5.9 (Q/C)	0.015	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Regulatory	EMP Survivability, kA per in. perimeter	MIL-DTL-83528 Para. 4.5.16 (Q)	>0.9	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	RoHS Compliant	--	Yes	Yes	Yes	Yes	Yes
	UL 94 Flammability Rating	UL 94	Not Tested	V-0	V-0	V-0	Not Tested

Note A: Compression set is expressed as a percentage of deflection per ASTM D395 Method B, at 25% deflection. To determine percent recovery, subtract 0.25 of the stated compression set value from 100%. For example, in the case of 30% compression set, recovery is 92.5%.
Note B: Where two values are shown, the first represents max. operating temp. for conformance to MIL-DTL-83528 (which requires Group A life testing at 1.25 times max. operating temp.) and the second value represents the practical limit for ex posure up to 1000 hrs. (compressed between flanges 7-10%). Single values conform to both definitions.
Note C: Copies of CEPS-0002, CHO-TP08 and CHO-TP09 are available from Chomerics. Contact Applications Engineering.
Note D: Heat aging condition: 100°C for 48 hrs.
Note E: Heat aging condition: 150°C for 48 hrs.

Note F: It may not be inferred that the same level of shielding effectiveness provided by a gasket material tested in the fixture per MIL-DTL-83528 Para. 4.5.12 would be provided in an actual equipment flange, since many mechanical factors of the flange design (tolerances, stiffness, fastener location and size, etc.) could lower or enhance shielding effectiveness. This procedure provides data applicable only to the test fixture design of MIL-DTL-83528, but which is useful for making comparisons between different gasket materials. The 40 GHz test data for all materials uses TP08 test method.
Note G: Heat aging condition: 200 °C for 48 hours
Note H: Heat aging condition: 125 °C for 1000 hours

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Elastomer Binder Legend

Silicone | Fluorosilicone | EPDM | Fluorocarbon/ Fluorosilicone

Elastomer Filler Legend

Corrosion Resistant on Aluminum

continued...Table 6: Material Guidelines - Military and Commercial - *continued*							
		Test Procedure (Type of Test)	CHO-SEAL 6330	CHO-SEAL L6303	CHO-SEAL 1350	CHO-SEAL 1310	CHO-SEAL 1273
Physical	Molded (M) or Extruded (E)	--	M	M/E	M/E [J]	M	M/E
Physical	Conductive Filler	--	Ni/C	Ni/C	Ag/Glass	Ag/Glass	Ag/Cu
Physical	Elastomer Binder	--	Silicone	Fluorosilicone	Silicone	Silicone	Silicone
Physical	Type (Ref. MIL-DTL-83528)	--	Not Applicable	Not Applicable	Type M[J]	Not Applicable	Not Applicable
Physical	Volume Resistivity, ohm-cm, max., as supplied without pressure sensitive adhesive	CEPS-0002[c] (Q/C)	0.250	0.100	Not Applicable	0.010	0.004
Physical	Volume Resistivity, ohm-cm, max., as supplied without pressure sensitive adhesive	MIL-DTL-83528 (Q/C)	Not Applicable	Not Applicable	0.006	Not Applicable	Not Applicable
Physical	Hardness, Shore A	ASTM D2240 (Q/C)	40 ±7	65 ±10	65 ±7	70 ±10	65 ±8
Physical	Specific Gravity	ASTM D792 (Q/C)	1.70 ± 0.25	2.20 ± 0.25	1.90 ± 0.25	1.80 ± 0.25	3.70 ± 0.25
Physical	Tensile Strength, psi (MPa), min.	ASTM D412 (Q/C)	120 (0.83)	150 (1.03)	200 (1.38)	200 (1.38)	175 (1.21)
Physical	Elongation, % min. or % min./max.	ASTM D412 (Q/C)	75	60	100/300	100	75
Physical	Tear Strength, lb/in. (kN/m), min.	ASTM D624 (Q)	Not Tested	35 (6.13)	30 (5.25)	Not Tested	Not Tested
Physical	Compression Set, 70 hrs at 100°C, % max. [A]	ASTM D395, Method B (Q)	25	25	30	35	32
Thermal	Low Temperature Flex TR10, °C, min.	ASTM D1329 (Q)	-40	-45	-55	-40	-65
Thermal	Maximum Continuous Use Temperature, °C [B]	--	150	150	160	160	125
Thermal	Thermal Conductivity, W/m-K (Typical) 300 psi (2.07 MPa)	ASTM D5470	0.6	0.8	1.2	Not Tested	Not Tested
Electrical	Shielding Effectiveness, dB, min. [F]	Method 1: CHO-TP08[C] (Q)	Method 3	Method 1	Method 2	Method 1	Method 1
Electrical	200 kHz (H Field)		Not Tested	Not Tested	50	Not Tested	Not Tested
Electrical	100 MHz (E Field)	Method 2: MIL-DTL-83528 Para. 4.5.12 (Q)	75	100	125	100	100
Electrical	500 MHz (E Field)		75	100	114	100	100
Electrical	2 GHz (Plane Wave)		70	100	116	90	100
Electrical	10 GHz (Plane Wave)		70	100	124	80	100
Electrical	40 GHz (Plane Wave)	Method 3: CHO-TP09[C] (Q)	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
Electrical	Electrical Stability, ohm-cm, max.: Heat Aging	CEPS-0002[c] (Q)	0.250[e]	0.250[e]	Not Applicable	0.010	0.010
Electrical	Electrical Stability, ohm-cm, max.: Heat Aging	MIL-DTL-83528 Para. 4.5.15 (Q/C)	Not Applicable	Not Applicable	0.015	Not Applicable	Not Applicable
Electrical	Electrical Stability, ohm-cm, max.: Resistance During Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	Not Applicable	Not Applicable	0.009	Not Applicable	Not Applicable
Electrical	Electrical Stability, ohm-cm, max.: Resistance After Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	Not Applicable	Not Applicable	0.006	Not Applicable	Not Applicable
Electrical	Electrical Stability, ohm-cm, max.: Post Tensile Set Volume Resistivity	MIL-DTL-83528 Para. 4.5.9 (Q/C)	Not Applicable	Not Applicable	0.009	Not Applicable	Not Applicable
Regulatory	EMP Survivability, kA per in. perimeter	MIL-DTL-83528 Para. 4.5.16 (Q)	Not Applicable	Not Applicable	>0.9	Not Applicable	Not Applicable
Regulatory	RoHS Compliant	--	Yes	Yes	Yes	Yes	Yes
Regulatory	UL 94 Flammability Rating	UL 94	Not Tested	Not Tested	Not Tested	V-0	V-0

Note A: Compression set is expressed as a percentage of deflection per ASTM D395 Method B, at 25% deflection. To determine percent recovery, subtract 0.25 of the stated compression set value from 100%. For example, in the case of 30% compression set, recovery is 92.5%.
Note B: Where two values are shown, the first represents max. operating temp. for conformance to MIL-DTL-83528 (which requires Group A life testing at 1.25 times max. operating temp.) and the second value represents the practical limit for ex posure up to 1000 hrs. (compressed between flanges 7-10%). Single values conform to both definitions.
Note C: Copies of CEPS-0002, CHO-TP08 and CHO-TP09 are available from Chomerics. Contact Applications Engineering.
Note D: Heat aging condition: 100°C for 48 hrs.
Note E: Heat aging condition: 150°C for 48 hrs.
Note F: It may not be inferred that the same level of shielding effectiveness provided by a gasket material tested in the fixture per MIL-DTL-83528 Para. 4.5.12 would be provided in an actual equipment flange, since many mechanical factors of the flange design (tolerances, stiffness, fastener location and size, etc.) could lower or enhance shielding effectiveness. This procedure provides data applicable only to the test fixture design of MIL-DTL-83528, but which is useful for making comparisons between different gasket materials. The 40 GHz test data for all materials uses TP08 test method.
Note G: Heat aging condition: 200 °C for 48 hours
Note H: Heat aging condition: 125 °C for 1000 hours
Note J: Molded version of 1350 meets Mil-DTL-83528 type M specifications.
Extruded version of 1350 meets Mil-DTL-83528 type M specifications except elongation (60/260).

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Elastomer Binder Legend

Silicone (white) | Fluorosilicone (green) | EPDM (orange) | Fluorocarbon/ Fluorosilicone (blue)

Elastomer Filler Legend

Corrosion Resistant on Aluminum (purple)

continued...Table 6: Material Guidelines - Military and Commercial - *continued*							
		Test Procedure (Type of Test)	**CHO-SEAL 1270**	**CHO-SEAL 1224**	**CHO-SEAL 1221**	**CHO-SEAL 1401**	**CHO-SEAL 1239**
Physical	Molded (M) or Extruded (E)	--	M	M	M	M/E	M
Physical	Conductive Filler	--	Ag/Cu	Ag	Ag	Ag	Ag/Cu
Physical	Elastomer Binder	--	Silicone	Silicone	Fluorosilicone	Silicone	Silicone & Expanded Cu Foil
Physical	Type (Ref. MIL-DTL-83528)	--	Not Applicable	Type E	Type F	Type J	Type G
Physical	Volume Resistivity, ohm-cm, max., as supplied without pressure sensitive adhesive	CEPS-0002[c] (Q/C)	0.050	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Physical		MIL-DTL-83528 (Q/C)	Not Applicable	0.002	0.002	0.010	0.007
Physical	Hardness, Shore A	ASTM D2240 (Q/C)	40 ±7	65 ±7	75 ±7	45 ±5	80 ±7
Physical	Specific Gravity	ASTM D792 (Q/C)	2.90 ± 0.25	3.50 ±0.45	4.00 ±0.50	1.60 ± 0.25	4.75 ± 0.75
Physical	Tensile Strength, psi (MPa), min.	ASTM D412 (Q/C)	80 (0.55)	300 (2.07)	250 (1.72)	200 (1.38)	600 (4.14)
Physical	Elongation, % min. or % min./max.	ASTM D412 (Q/C)	75	200/500	100/300	75	20
Physical	Tear Strength, lb/in. (kN/m), min.	ASTM D624 (Q)	Not Tested	50 (8.75)	40 (7.00)	20 (3.50)	70 (12.25)
Physical	Compression Set, 70 hrs at 100°C, % max. [A]	ASTM D395, Method B (Q)	30	45	60	35	Not Tested
Thermal	Low Temperature Flex TR10, °C, min.	ASTM D1329 (Q)	-60	-65	-65	-55	Not Tested
Thermal	Maximum Continuous Use Temperature, °C [B]	--	125	160/200	160/200	160/200	125
Thermal	Thermal Conductivity, W/m-K (Typical) 300 psi (2.07 MPa)	ASTM D5470	0.8	2.8	Not Tested	0.9	1.9
Electrical	Shielding Effectiveness, dB, min. [F]	Method 1: CHO-TP08[c] (Q) Method 2: MIL-DTL-83528 Para. 4.5.12 (Q) Method 3: CHO-TP09[c] (Q)	Method 3	Method 2	Method 2	Method 2	Method 2
Electrical	200 kHz (H Field)		Not Tested	70	70	60	70
Electrical	100 MHz (E Field)		80	120	120	100	110
Electrical	500 MHz (E Field)		80	120	120	100	110
Electrical	2 GHz (Plane Wave)		70	120	120	90	110
Electrical	10 GHz (Plane Wave)		70	120	120	80	110
Electrical	40 GHz (Plane Wave)		Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
Electrical	Electrical Stability, ohm-cm, max. – Heat Aging	CEPS-0002[c] (Q)	0.100[e]	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Electrical		MIL-DTL-83528 Para. 4.5.15 (Q/C)	Not Applicable	0.010	0.010	0.015	0.010
Electrical	Electrical Stability, ohm-cm, max. – Resistance During Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	Not Applicable	0.010	0.010	0.015	0.007
Electrical	Electrical Stability, ohm-cm, max. – Resistance After Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	Not Applicable	0.002	0.002	0.010	Not Applicable
Electrical	Electrical Stability, ohm-cm, max. – Post Tensile Set Volume Resistivity	MIL-DTL-83528 Para. 4.5.9 (Q/C)	Not Applicable	0.010	0.010	0.020	Not Applicable
Regulatory	EMP Survivability, kA per in. perimeter	MIL-DTL-83528 Para. 4.5.16 (Q)	Not Applicable	>0.9	>0.9	>0.9	>0.9
Regulatory	RoHS Compliant	--	Yes	Yes	Yes	Yes	Yes
Regulatory	UL 94 Flammability Rating	UL 94	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested

* Molded only

Note A: Compression set is expressed as a percentage of deflection per ASTM D395 Method B, at 25% deflection. To determine percent recovery, subtract 0.25 of the stated compression set value from 100%. For example, in the case of 30% compression set, recovery is 92.5%.
Note B: Where two values are shown, the first represents max. operating temp. for conformance to MIL-DTL-83528 (which requires Group A life testing at 1.25 times max. operating temp.) and the second value represents the practical limit for ex posure up to 1000 hrs. (compressed between flanges 7-10%). Single values conform to both definitions.
Note C: Copies of CEPS-0002, CHO-TP08 and CHO-TP09 are available from Chomerics. Contact Applications Engineering.
Note D: Heat aging condition: 100°C for 48 hrs.
Note E: Heat aging condition: 150°C for 48 hrs.
Note F: It may not be inferred that the same level of shielding effectiveness provided by a gasket material tested in the fixture per MIL-DTL-83528 Para. 4.5.12 would be provided in an actual equipment flange, since many mechanical factors of the flange design (tolerances, stiffness, fastener location and size, etc.) could lower or enhance shielding effectiveness. This procedure provides data applicable only to the test fixture design of MIL-DTL-83528, but which is useful for making comparisons between different gasket materials. The 40 GHz test data for all materials uses TP08 test method.
Note G: Heat aging condition: 200 °C for 48 hours
Note H: Heat aging condition: 125 °C for 1000 hours

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Elastomer Binder Legend

Silicone (white) | Fluorosilicone (green) | EPDM (salmon) | Fluorocarbon/Fluorosilicone (light blue)

Elastomer Filler Legend

Corrosion Resistant on Aluminum (purple)

continued...Table 6: Material Guidelines - Military and Commercial - *continued*			Test Procedure (Type of Test)	CHO-SEAL 1212	CHO-SEAL 6435	CHO-SEAL 6307	CHO-SEAL 6452	CHO-SEAL 6460
Physical	Molded (M) or Extruded (E)		--	M	M	M	E	M
Physical	Conductive Filler		--	Ag/Cu	Ag/Ni	Ni/C	Ni/C	Ni/Al+Ni/C
Physical	Elastomer Binder		--	Silicone	EPDM	EPDM	EPDM	EPDM
Physical	Type (Ref. MIL-DTL-83528)		--	Type K	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Physical	Volume Resistivity, ohm-cm, max., as supplied without pressure sensitive adhesive		CEPS-0002[c] (Q/C)	Not Applicable	0.006	5.000	Not Applicable	Not Applicable
Physical			MIL-DTL-83528 (Q/C)	0.005	Not Applicable	Not Applicable	0.500	0.600
Physical	Hardness, Shore A		ASTM D2240 (Q/C)	85 ±7	80 ±7	75 ±7	70 ±10	65 ±7
Physical	Specific Gravity		ASTM D792 (Q/C)	3.50 ± 0.45	3.70 ± 0.25	1.90 ± 0.25	1.95 ± 0.25	1.80 ± 0.25
Physical	Tensile Strength, psi (MPa), min.		ASTM D412 (Q/C)	400 (2.76)	200 (1.38)	200 (1.38)	200 (1.38)	200 (1.38)
Physical	Elongation, % min. or % min./max.		ASTM D412 (Q/C)	100/300	200	75	200	200
Physical	Tear Strength, lb/in. (kN/m), min.		ASTM D624 (Q)	40 (7.00)	75 (13.13)	60 (10.51)	55 (9.63)	50 (8.75)
Physical	Compression Set, 70 hrs at 100°C, % max. [A]		ASTM D395, Method B (Q)	35	40	40	35	30
Thermal	Low Temperature Flex TR10, °C, min.		ASTM D1329 (Q)	-45	-40	-45	-50	-50
Thermal	Maximum Continuous Use Temperature, °C [B]		--	125	100	100	100	100
Thermal	Thermal Conductivity, W/m-K (Typical) 300 psi (2.07 MPa)		ASTM D5470	1.8	1.8	0.6	Not Tested	Not Tested
Electrical	Shielding Effectiveness, dB, min. [F]		Method 1: CHO-TP08[C] (Q)	Method 2	Method 2	Method 2	Method 3	Method 2
Electrical	200 kHz (H Field)			70	Not Tested	Not Tested	Not Tested	Not Tested
Electrical	100 MHz (E Field)		Method 2: MIL-DTL-83528 Para. 4.5.12 (Q)	120	105	95	75	110
Electrical	500 MHz (E Field)			120	100	90	100	120
Electrical	2 GHz (Plane Wave)			120	85	85	105	105
Electrical	10 GHz (Plane Wave)			120	85	85	85	100
Electrical	40 GHz (Plane Wave)		Method 3: CHO-TP09[C] (Q)	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested
Electrical	Electrical Stability, ohm-cm, max.	Heat Aging	CEPS-0002[c] (Q)	Not Applicable	0.0125 [d]	10[d]	Not Applicable	Not Applicable
Electrical	Electrical Stability, ohm-cm, max.	Heat Aging	MIL-DTL-83528 Para. 4.5.15 (Q/C)	0.010	Not Applicable	Not Applicable	0.350	2.500[D]
Electrical	Electrical Stability, ohm-cm, max.	Resistance During Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	0.010	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Electrical	Electrical Stability, ohm-cm, max.	Resistance After Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	0.005	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Electrical	Electrical Stability, ohm-cm, max.	Post Tensile Set Volume Resistivity	MIL-DTL-83528 Para. 4.5.9 (Q/C)	0.010	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Regulatory	EMP Survivability, kA per in. perimeter		MIL-DTL-83528 Para. 4.5.16 (Q)	>0.9	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Regulatory	RoHS Compliant		--	Yes	Yes	Yes	Yes	Yes
Regulatory	UL 94 Flammability Rating		UL 94	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested

Note A: Compression set is expressed as a percentage of deflection per ASTM D395 Method B, at 25% deflection. To determine percent recovery, subtract 0.25 of the stated compression set value from 100%. For example, in the case of 30% compression set, recovery is 92.5%.
Note B: Where two values are shown, the first represents max. operating temp. for conformance to MIL-DTL-83528 (which requires Group A life testing at 1.25 times max. operating temp.) and the second value represents the practical limit for ex posure up to 1000 hrs. (compressed between flanges 7-10%). Single values conform to both definitions.
Note C: Copies of CEPS-0002, CHO-TP08 and CHO-TP09 are available from Chomerics. Contact Applications Engineering.
Note D: Heat aging condition: 100°C for 48 hrs.
Note E: Heat aging condition: 150°C for 48 hrs.
Note F: It may not be inferred that the same level of shielding effectiveness provided by a gasket material tested in the fixture per MIL-DTL-83528 Para. 4.5.12 would be provided in an actual equipment flange, since many mechanical factors of the flange design (tolerances, stiffness, fastener location and size, etc.) could lower or enhance shielding effectiveness. This procedure provides data applicable only to the test fixture design of MIL-DTL-83528, but which is useful for making comparisons between different gasket materials. The 40 GHz test data for all materials uses TP08 test method.
Note G: Heat aging condition: 200 °C for 48 hours
Note H: Heat aging condition: 125 °C for 1000 hours

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Elastomer Binder Legend

Silicone | Fluorosilicone | EPDM | Fluorocarbon/ Fluorosilicone

Elastomer Filler Legend

Corrosion Resistant on Aluminum

continued...Table 7: Material Guidelines - Specialty Products - *continued*				
		Test Procedure (Type of Test)	**CHO-SEAL V6433**	**CHO-SEAL S6600**
Physical	Molded (M) or Extruded (E)	--	M	M
Physical	Conductive Filler	--	Ag/Ni	Carbon
Physical	Elastomer Binder	--	Fluorocarbon/ Fluorosilicone	Silicone
Physical	Type (Ref. MIL-DTL-83528)	--	Not Applicable	Not Applicable
Physical	Volume Resistivity, ohm-cm, max., as supplied without pressure sensitive adhesive	CEPS-0002[c] (Q/C)	Not Applicable	7
Physical		MIL-DTL-83528 (Q/C)	0.006	Not Applicable
Physical	Hardness, Shore A	ASTM D2240 (Q/C)	85 ±7	75 ±7
Physical	Specific Gravity	ASTM D792 (Q/C)	4.80 ± 0.25	1.20 ±0.25
Physical	Tensile Strength, psi (MPa), min.	ASTM D412 (Q/C)	400 (2.76)	650 (4.48)
Physical	Elongation, % min. or % min./max.	ASTM D412 (Q/C)	50	70
Physical	Tear Strength, lb/in. (kN/m), min.	ASTM D624 (Q)	70 (12.25)	Not Tested
Physical	Compression Set, 70 hrs at 100°C, % max. [(A)]	ASTM D395, Method B (Q)	45	45
Thermal	Low Temperature Flex TR10, °C, min.	ASTM D1329 (Q)	-25	-45
Thermal	Maximum Continuous Use Temperature, °C [(B)]	--	200	200
Thermal	Thermal Conductivity, W/m-K (Typical) 300 psi (2.07 MPa)	ASTM D5470	2.1	0.6
Electrical	Shielding Effectiveness, dB, min. [(F)]	Method 1: CHO-TP08[C] (Q) Method 2: MIL-DTL-83528 Para. 4.5.12 (Q) Method 3: CHO-TP09[C] (Q)	Method 2	Method 1
Electrical	200 kHz (H Field)		Not Tested	Not Tested
Electrical	100 MHz (E Field)		105	80
Electrical	500 MHz (E Field)		100	80
Electrical	2 GHz (Plane Wave)		90	60
Electrical	10 GHz (Plane Wave)		90	50
Electrical	40 GHz (Plane Wave)		Not Tested	Not Tested
Electrical – Electrical Stability, ohm-cm, max.	Heat Aging	CEPS-0002[c] (Q)	0.008[g]	7 [(E)]
Electrical – Electrical Stability, ohm-cm, max.		ohm-cm, max.	Not Applicable	Not Applicable
Electrical – Electrical Stability, ohm-cm, max.	Resistance During Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	Not Applicable	Not Applicable
Electrical – Electrical Stability, ohm-cm, max.	Resistance After Vibration	MIL-DTL-83528 Para. 4.5.13 (Q)	Not Applicable	Not Applicable
Electrical – Electrical Stability, ohm-cm, max.	Post Tensile Set Volume Resistivity	MIL-DTL-83528 Para. 4.5.9 (Q/C)	Not Applicable	Not Applicable
Regulatory	EMP Survivability, kA per in. perimeter	MIL-DTL-83528 Para. 4.5.16 (Q)	Not Applicable	Not Applicable
Regulatory	RoHS Compliant	--	Yes	Yes
Regulatory	UL 94 Flammability Rating	UL 94	Not tested	Not Tested

Note A: Compression set is expressed as a percentage of deflection per ASTM D395 Method B, at 25% deflection. To determine percent recovery, subtract 0.25 of the stated compression set value from 100%. For example, in the case of 30% compression set, recovery is 92.5%.
Note B: Where two values are shown, the first represents max. operating temp. for conformance to MIL-DTL-83528 (which requires Group A life testing at 1.25 times max. operating temp.) and the second value represents the practical limit for ex posure up to 1000 hrs. (compressed between flanges 7-10%). Single values conform to both definitions.
Note C: Copies of CEPS-0002, CHO-TP08 and CHO-TP09 are available from Chomerics. Contact Applications Engineering.
Note D: Heat aging condition: 100°C for 48 hrs.
Note E: Heat aging condition: 150°C for 48 hrs.

Note F: It may not be inferred that the same level of shielding effectiveness provided by a gasket material tested in the fixture per MIL-DTL-83528 Para. 4.5.12 would be provided in an actual equipment flange, since many mechanical factors of the flange design (tolerances, stiffness, fastener location and size, etc.) could lower or enhance shielding effectiveness. This procedure provides data applicable only to the test fixture design of MIL-DTL-83528, but which is useful for making comparisons between different gasket materials. The 40 GHz test data for all materials uses TP08 test method.
Note G: Heat aging condition: 200 °C for 48 hours
Note H: Heat aging condition: 125 °C for 1000 hours

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