



## EMI-Shielded O-rings and Seals

### Superior sealing and EMI suppression in one, from Apple Rubber Products

Today's electronic enclosures — from laptops and PDAs to portable medical devices and consumer electronics — require cost-effective, high performance EMI shielding. Now, Apple Rubber Products offers custom designed, EMI-Shielded O-rings and seals for a variety of electronic applications. Apple Rubber provides an alternative to metallic coating of parts and other methods utilized for EMI shielding, while delivering a reliable sealing solution.

#### Sealing and shielding in one.

Made with conductive, particle-filled elastomers, our O-rings and seals provide high EMI shielding effectiveness in an environmental or pressure seal. The microscopic particles establish a conductive path within the elastomer to create a versatile seal for use in EMI suppression.

Particle fillers include silver, copper, nickel and graphite. Elastomers can be formulated in a range from 7 to .002 resistances in ohms centimeters. These materials are low outgassing with low TML and CVCM to help prevent interference with electrical contacts.



## The solution for a variety of applications.

Our EMI-Shielded seals are designed to provide a conductive interface/seal for applications in a variety of industries including:

- Telecommunications ◦ Military ◦ Medical ◦ Aerospace
- Automotive ◦ Consumer and industrial electronics

### Available Fillers

- Pure Nickel ◦ Silver/Glass ◦ Silver/Nickel
- Silver/Aluminum ◦ Silver/Copper
- Low Density Silver ◦ Pure Silver

### Available Elastomers

- Silicone ◦ Fluorosilicone ◦ EPDM



## Custom-designed for your exact specifications.

Apple Rubber offers seals utilizing commercial grade and military grade shielding elastomers and can produce EMI-Shielded seals in an unlimited variety of shapes and sizes. We have a broad range of experience in the electronics industry and offer the design engineering capabilities to deliver the exact solution for your applications.

- Composite seals combining elastomers with plastic, metal or mesh material
- MicroSeals™ EMI-Shielded microminiature seals and O-rings
- Molded inserts
- Expert prototyping and fast turnaround
- Advanced production systems
- ISO 9001:2000 Certified
- You buy direct from our USA plant

## Conductive Elastomer Specifications

Filler	Units	Method	Carbon	Nickel Graphite	Nickel Graphite	Silver Aluminum	Silver Aluminum	Pure Silver	Pure Silver	Nickel Graphite
<b>Polymer</b>		ASTM	Silicone	Silicone	Fluoro-silicone	Silicone	Fluoro-silicone	Silicone	Fluoro-silicone	EPDM
<b>Volume Res.</b>	<b>Ohm-cm</b>		<b>7</b>	<b>0.1</b>	<b>0.1</b>	<b>0.008</b>	<b>0.012</b>	<b>0.002</b>	<b>0.002</b>	<b>5</b>
Operating Temp. (C)	Min		-55	-55	-55	-55	-55	-55	-65	-30
	Max		200	150	150	160	160	160	160	100
Hardness	Shore A	D2240	70	30-70	65	65	70	65	75	75
Specific Gravity	g/ccm	D792	1.2	1.95	1.95	2	2	2	2	2.1
Compression Deflection	% (min)		3.5	3.5	3	3.5	3.5	2.5	3.5	2
Tensile Strength	psi	D412	650	150	150	200	180	300	250	200
Elongation	% (min)	D412	100	100	100	100	60	200	100	75
Compression Set	%	D395	40	35	25	32	30	45	60	40
22 hours at 100°C										
Tear Strength	lbs/in	D624	40	40	35	30	35	50	40	70
<b>Shielding Effectiveness</b> as tested per Mil-DTL-83528	100 MHz		80	100	100	120	120	120	120	90
	500 Mhz		80	100	100	120	120	120	120	90
	2 GHz		60	100	100	115	115	120	120	80
	10 GHz		50	100	100	115	115	120	120	80

\* All Mil-83528 TYPE materials available upon request.

Apple Rubber can custom blend a material to meet your exact specifications.

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Seal it right. Right from Apple.™

**APPLE RUBBER PRODUCTS**

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