

CHO-MASK® II

Conductive Foil Tape with Peel-Off Mask for Painting Operations



Customer Value Proposition

Parker Chomerics CHO-MASK® II Conductive Foil Tape is available in Standard Tack (ST) and High Tack (HT) versions, providing an electrically conductive, non-corroding surface on painted metal electronic enclosures.

CHO-MASK II tapes consist of recessed polyester paint masking film covering a layer of either 1 oz (28.4 g) or 2 oz (56.7 g) tin-plated copper foil. The back of the foil features a conductive pressure sensitive adhesive (PSA). CHO-MASK II tape is applied to clean metal frame, door and panel surfaces where electrical continuity is required.

After painting, the peel-off mask is easily removed, allowing the paint to seal both edges of the foil layer. The foil imparts a clean, electrically conductive path from the panel, through an EMI gasket, to the cabinet frame. It also provides grounding points within the enclosure.

Contact Information

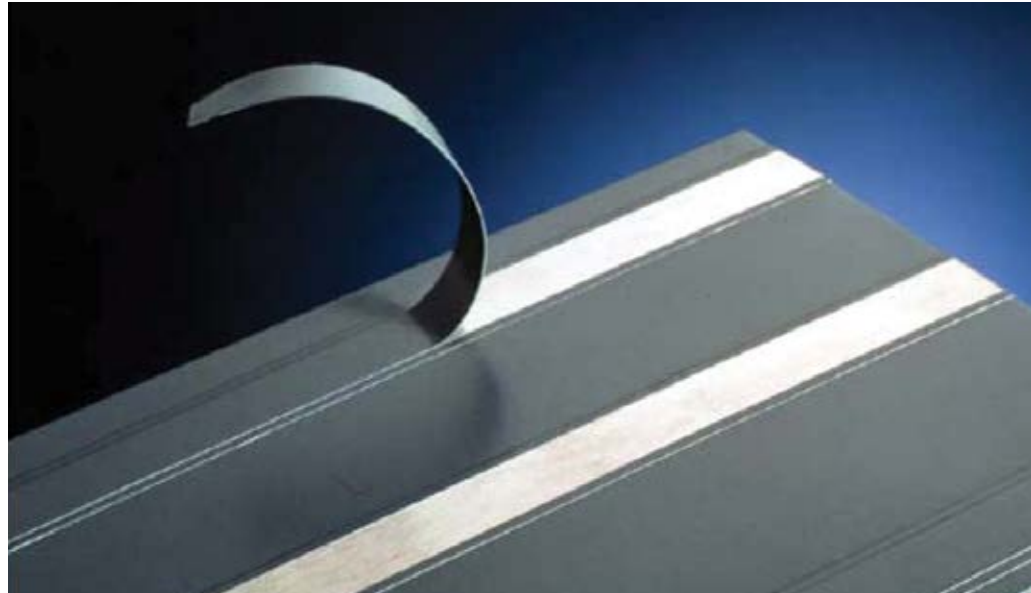
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Product Features

- More cost-effective and environmentally friendly than plating and coating methods
- Peel-off mask is removed easily any time, at any temperature
- Mask is recessed from edges for paint overlap and corrosion protection
- Solvent/chemical resistant
- Maintains performance after 10,000 door closure cycles
- Passes MIL-STD-810 Salt Fog testing
- Foil tape meets MIL-T-47012
- Tin-plated on foil meets MIL-T-10727
- Pressure sensitive adhesive contains highly stable, conductive particles for long-term reliability
- Provides effective EMI shielding performance when used in conjunction with Parker Chomerics EMI gaskets

Typical Applications

- Enclosure enclosures
- Painted cabinets and boxes
- Doors and flanges or other mating seams



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CHO-MASK® II – Product Information

Table 1 – Technical Data

Typical Properties	CHO-MASK II ST (Standard Tack)	CHO-MASK II HT (High Tack)	Test Method
Foil Options	1 oz Tin-Plated Copper Foil 2 oz Tin-Plated Copper Foil		Visual
Foil/Fabric Thickness, mils (mm)	1 oz = 1.4 mils (0.04 mm) 2 oz = 2.8 mils (0.07 mm)		Visual
Masking Film	Polyester		Chomerics
Adhesive Type	Electrically Conductive, Pressure-Sensitive Acrylic		Visual
Adhesive Thickness, mils (mm)	1.8 (0.05)	2.0 (0.05)	Visual
Total Thickness ¹ , mils (mm)	1 oz = 3.2 (0.08) 2 oz = 4.6 (0.12)	1 oz = 3.0 (0.08) 2 oz = 4.8 (0.12)	ASTM-D1000
Temperature Range, °F (°C)	-40 to 180 (-40 to 82)		Chomerics
Electrical Resistance ² , milliohms	<200		Chomerics TM 71
Flammability Resistance	510		UL
Adhesion Foil to Cabinet Substrate	See Table 2		ASTM-D1000
Adhesion ² Mask to Foil, oz/in (N/m)	24 (263)		ASTM-D1000
Adhesion After Heat Aging, lbs/in (N/m), 48 hours @ 365°F (185°C)	2.8 (490)		ASTM-D1000
Corrosion Resistance ³	Pass		MIL-STD-810
Chemical Resistance ⁴	Pass		ASTM-D896-84
Humidity Exposure ⁵	Pass		ASTM-D1001
Gasket Closure Cycling (10,000 cycles, 15% deflection)	See Table 4		Chomerics TR 40
Shelf Life, months from date of shipment	24		Chomerics

¹ Adhesive and foil total thickness

² After bake

³ Salt Fog Chamber at 35° C, 144 hrs (CHO-MASK II tape adhered to steel plated, painted)

⁴ Withstands 1,1,1 Trichloroethane, ethanol, acids, cleaning solvents, and alkaline solutions without degradation

⁵ Tested at 60° C, 96 hrs, 95% RH

Application differences between CHO-MASK II ST and HT tape versions are shown below.

CHO-MASK II ST Tape

- Oven bake under 350°F (177°C)
- Suitable for flat flange and radius applications
- No length restriction

CHO-MASK II HT Tape

- Oven bake up to 400°F (204°C) for 1 hour
- Suitable for knife edge, radius and flat surface applications
- Lengths of <5 ft above 350°F (177°C) recommended

CHO-MASK® II – Product Information

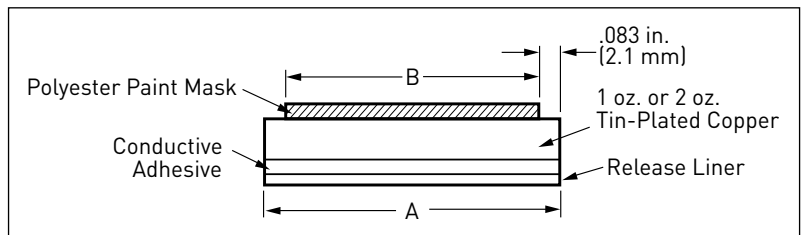
**Table 2 - Typical Post Bake Adhesion for ST and HT Versions
(Tin-plated copper tape to cabinet substrate)**

Test Environment	To Aluminum lbs/in (N/m)	To Steel lbs/in (N/m)
Baked 1 hour @ 350°F (177°C)	4.0 (700)	3.9 (683)
Baked 1 hour @ 400°F (204°C)	5.1 (893)	5.0 (875)
Baked 48 hours @ 350°F (177°C)	3.1 (543)	3.0 (525)
Baked 168 hours @ 165°F/95% RH (74°C)	4.1 (718)	4.0 (700)

Table 3 - CHO-MASK® II – Dimensions

If "A" is...	If "B" is...
.430 in (1.09 cm)	.265 in (.67 cm)
.500 in (1.27 cm)	.335 in (.85 cm)
.625 in (1.59 cm)	.460 in (1.17 cm)
.750 in (1.91 cm)	.585 in (1.48 cm)
.800 in (2.03 cm)	.635 in (1.61 cm)
1.000 in (2.54 cm)	.835 in (2.12 cm)
1.500 in (3.81 cm)	1.335 in (3.40 cm)
1.750 in (4.44 cm)	1.585 in (4.03 cm)

Figure 1 - CHO-MASK® II – Construction



**Table 4 - Adhesion Resistance
(10,000 door closure cycles at 15% deflection of various Chomerics EMI gaskets)**

EMI Gasket Type	Test Results	Comments
Conductive fabric	Pass	No defects/abrasions
SPRING-LINE™ beryllium copper	Pass	No defects/abrasions
Ag/Cu filled silicone elastomer	Pass	No defects/abrasions
Ag/Al filled silicone elastomer	Pass	No defects/abrasions
Ag filled silicone elastomer	Pass	No defects/abrasions
Ag/Ni filled silicone elastomer	Pass	No defects/abrasions
Ag/glass filled silicone elastomer	Pass	No defects/abrasions
Ag/Cu filled fluorosilicone elastomer	Pass	No defects/abrasions
Ag/Al filled fluorosilicone elastomer	Pass	No defects/abrasions
Ag filled fluorosilicone elastomer	Pass	No defects/abrasions
Ferrex** knitted wire mesh	Pass	No defects/abrasions
Monel** knitted wire mesh	Pass	No defects/abrasions
Monel knitted wire mesh with urethane foam core (SOFT-SHIELD® gasket)	Pass	No defects/abrasions
Aluminum knitted wire mesh	Pass	No defects/abrasions

* Tin-plated copper clad steel

** Nickel copper alloy

CHO-MASK® II – Product Information

CHO-MASK II Shielding Effectiveness (E-Field) with Various EMI Shielding Gaskets

Shielding effectiveness tests are performed using standard 2 oz CHO-MASK tape.

Figure 2

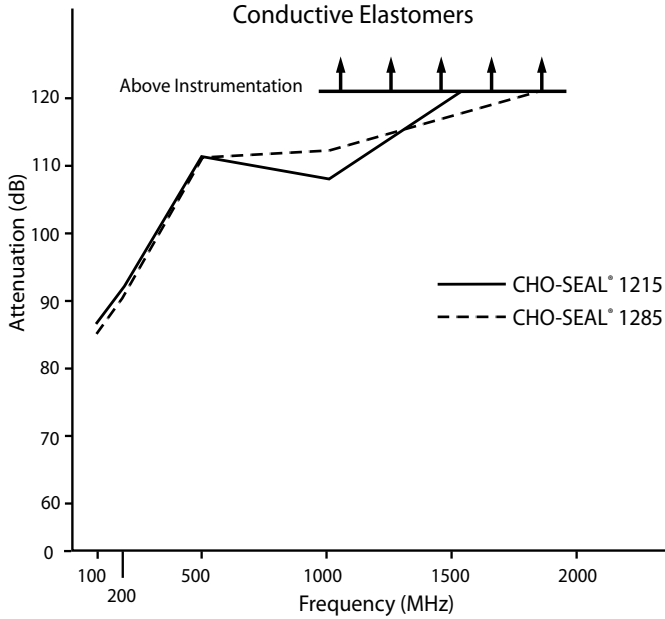


Figure 3

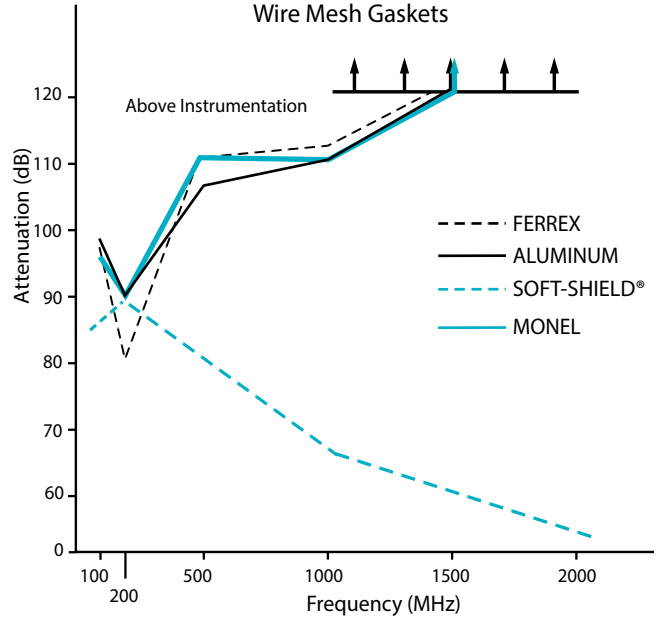


Table 5 - Shielding Effectiveness

Gasket Type and Description	Frequency (MHz)				
	100	200	500	1000	2000
CHO-SEAL® 1215 Silver-plated-copper filled silicone elastomer EMI gasket	85	90	110	107	120*
CHO-SEAL® 1285 Silver-plated-aluminum filled silicone elastomer EMI gasket	85	90	110	112	120*

* Beyond limit of instrumentation

Table 6 - Shielding Effectiveness

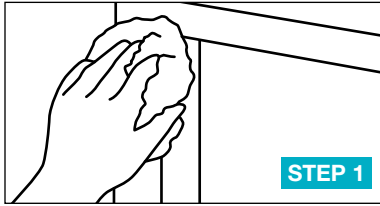
Gasket Type and Description	Frequency (MHz)				
	100	200	500	1000	2000
SOFT-SHIELD® 3500 Knitted wire mesh with urethane foam core EMI gasket	85	88	82	72	60
Aluminum Knitted wire mesh EMI gasket	98	90	106	110	120*
Ferrex Knitted wire mesh EMI gasket	99	89	110	112	120*
Monel Knitted wire mesh EMI gasket	95	90	110	110	120*

* Beyond limit of instrumentation

CHO-MASK® II – Application Information

Suggested Application Procedure

You will need: Cotton Cloth or Rag • Industrial Cleaner (such as toluene) • Rubber Gloves • Roller • Cutting Instrument (razor blade)



STEP 1

Step 1: To ensure maximum adhesion, remove all surface oils and dust. In large volume applications, proceed through your normal automated cabinet cleaning procedures. Note that phosphatizing can render cabinet surfaces nonconductive. It is recommended that you monitor the surface resistivity of the cabinet flange (surface resistivity should be <100 mOhms).

In small volume applications, clean cabinet flanges thoroughly with a cloth dampened with an industrial cleaner (acetone, toluene, or isopropyl alcohol). Wear rubber gloves, so cleaning agent do not come in contact with the skin.

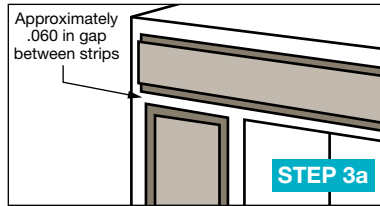
IMPORTANT: Avoid contact with or handling of the adhesive. Oils from the hand will affect adhesion.

Note: If oxidation or rust is present, abrade surface with sandpaper to expose clean metal before cleaning.



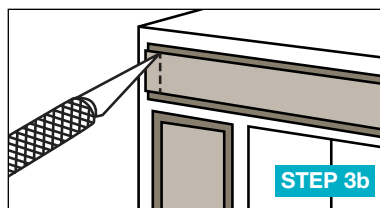
STEP 2

Step 2: Still wearing rubber gloves, peel away the release liner and apply the tape to cabinet flanges being careful to avoid wrinkles. Extend the tape beyond the corners and cut away excess. This prevents residual stress in foil from lifting tape at ends. Run a finger along the mask to provide initial adhesion.



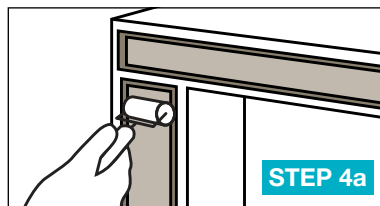
STEP 3a

Step 3a: The excess tape in each corner should now be trimmed. It is not necessary to overlap the tape in the corners. It is recommended that a gap be left between the vertical and horizontal strips. The gap should measure about .080 in (2.0 mm) wide (which is equivalent to the recessed edge of the tape). Later, when paint is applied to the cabinet this gap will be filled and serve to edge seal the tape ends.



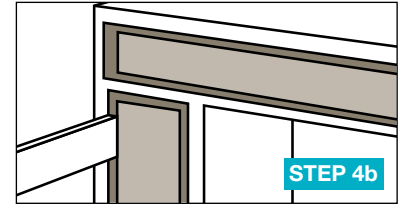
STEP 3b

Step 3b: Using the X-Acto knife, cut about a .080 in (2.0 mm) piece of the mask layer on each strip and remove. This will further ensure edge sealing when the cabinet is painted.



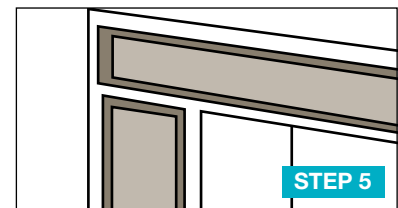
STEP 4a

Step 4a: Smooth over the surface of the tape with a small rubber roller.



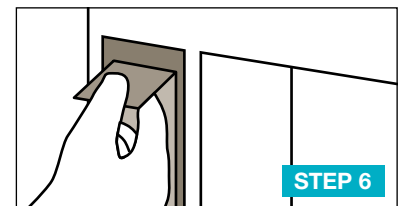
STEP 4b

Step 4b: Using a similar tool as pictured in Step 4b, touch down the exposed tinned copper edges until they are flat and even. **Note: Only moderate pressure is required (about 5 psi).**



STEP 5

Step 5: Cabinet is ready for normal phosphatizing and painting. Follow the manufacturer's instructions for paint application and curing. **Note: Recommended paint thickness, including primer, is 4 mils (0.1 mm) or more.**



STEP 6

Step 6: When the cabinet has reached room temperature, remove the mask at a 180° angle from the foil tape leaving a clean, conductive grounding surface.

Note: Mask is easily removed at room temperature, with or without baking.

Picture 1 - Proper way to remove CHO-MASK mask



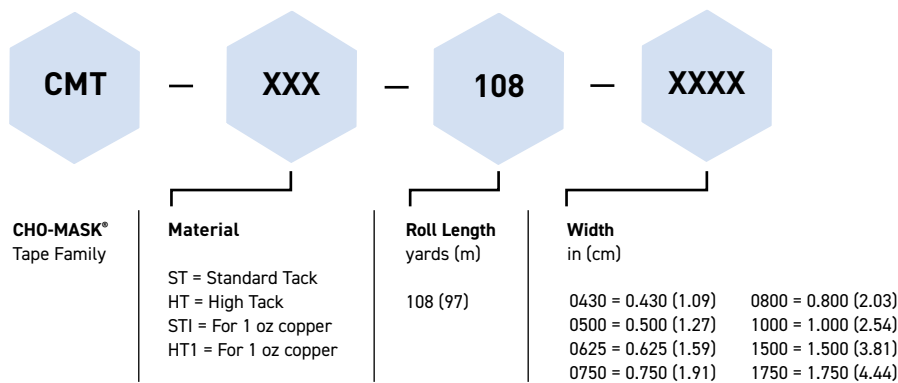
CHO-MASK® II – Application Information

Table 7 - Troubleshooting Problems in Applications

Problem	Possible Causes	Solutions
Ends of the tape are lifting up.	Improper application, corner termination	Make sure that Steps 2, 3a, and 3b are completed properly.
Tape wrinkles during application.	Tape not being applied in straight segments. Tape not adequately adhered to flange.	Using the cabinet edge as reference, apply the tape in straight segments. Also be sure that Steps 4 and 6 are completed properly.
Voids in paint are appearing along the tape edges.	Paint has been applied too thin.	Paint should be applied in a thickness of 4 mils (0.1 mm) or greater.
Tape is not sticking well to the cabinet.	Oil, dust, contamination. Cabinet not cleaned properly. Not enough pressure was used with the applicator along the edges of tape.	Make sure Step 1 is completed properly. See Step 4 for use of applicator.
Splice found in CHO-MASK II tape roll, or ran out of tape before completing flange.	N/A	Start new strip. Leave .060 in (1.5 mm) gap between both pieces.
Design requires paint overlap at cut ends.	Mask not recessed in this area.	Recess the mask manually by cutting and removing about 0.125 in (3 mm).

Ordering Information

Table 8 - Part Numbering – standard rolls



Alternate constructions and non-standard roll sizes are available. Please contact Parker Chomerics Application Engineering for details.

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