WIN-SHIELD™ Elite EMI Shielded Windows

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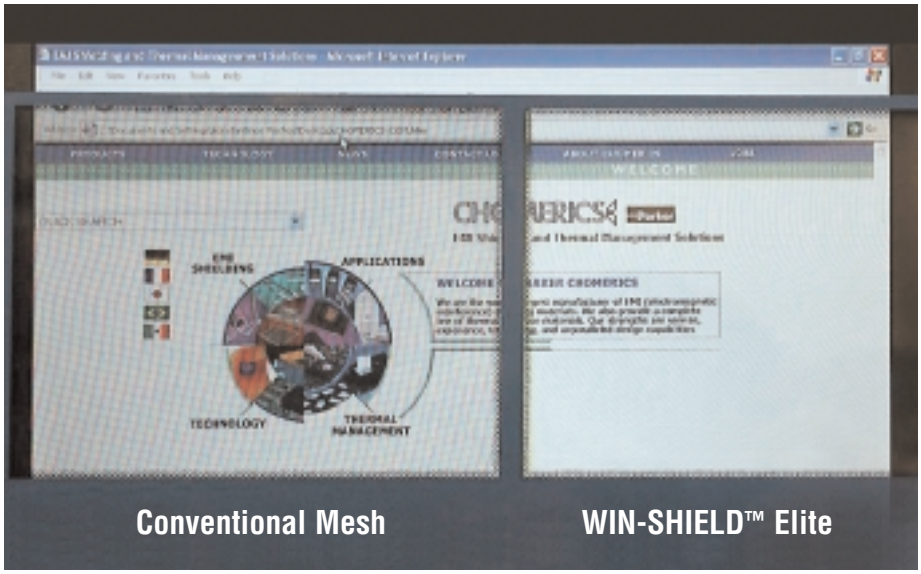
WIN-SHIELD™ Elite EMI shielded windows provide exceptional optical performance without sacrificing EMI shielding. This new generation of shielded windows is designed specifically to address shielding concerns in electronic equipment, especially medical devices, industrial process, measurement and control equipment, and test equipment.

WIN-SHIELD™ Elite windows use a proprietary mesh shielding design that provides superior light transmission and EMI shielding properties when compared to traditional shielded window designs. Total shielded window light transmittance properties (Figure 4), result from the mesh, substrates and surface finishes used. This new design also minimizes the typical problem with text distortion on display screens caused by the shielding mesh orientation, i.e., the moiré effect. Through improved, efficient manufacturing operations, these features are available at prices typically below conventional shielded windows.

WIN-SHIELD™ Elite EMI shielded windows are manufactured as a fully laminated construction with optically matched adhesives and front and rear



UL 94V-0 rated, optical grade, polycarbonate substrates. Standard finish for the front surface is a non-glare hardcoat. A clear hardcoat finish is standard on the rear surface. An optional clear hardcoat is available on the front surface. The shielding media is provided by the proprietary mesh design.

WIN-SHIELD™ Elite windows are available in standard 1.5 mm (0.06 in.), 2.0 mm (0.078), 2.5 mm (0.10 in.), 3.0 mm (0.12 in.) and 4.0 mm (0.157 in.) thicknesses. Window termination can be either square or stepped, with Chomerics silver epoxy busbar. WIN-SHIELD™ Elite windows are also available with Chomerics' SOFT-SHIELD® 5000 EMI gasket termination. SOFT-SHIELD 5000 gaskets feature a conductive cloth over urethane foam core. (See SOFT-SHIELD 5000 page.)

Figure 1 – Termination for WIN-SHIELD™ Elite Windows

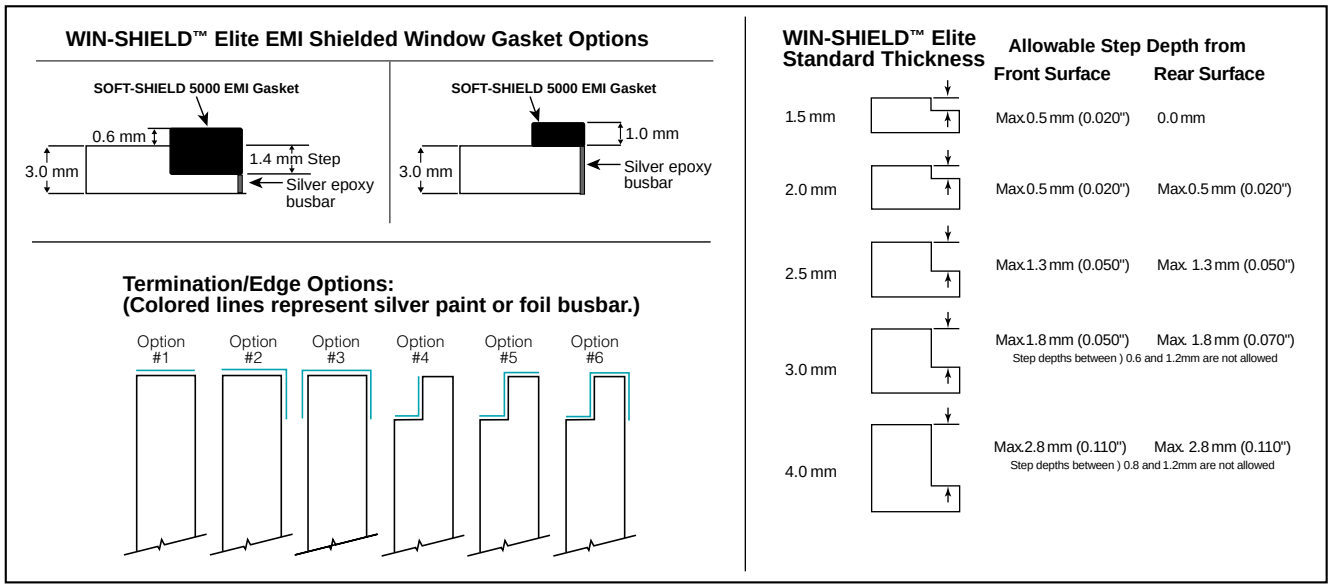


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Table 1

WIN-SHIELD™ Elite WINDOW SPECIFICATIONS	
Front Surface	Non-glare hard coating. Clear hard coat.
Rear Surface	Clear hard coat is standard
Substrate	High optical grade polycarbonate.
EMI Shielding Effectiveness	See Figure 2
Scratch Resistance	High scratch resistance to Pencil Test Type 2H.
Light Transmission	65-70% for the final assembly (Figure 4)
Quality	WIN-SHIELD Elite windows are manufactured and inspected to Chomerics Optical Inspection Standard.
Standard Thickness	1.5 mm (0.06 in.), 2.0 mm (0.08 in.), 2.5 mm (0.10 in.), 3.0 mm (0.12 in.), 4.0 mm (0.15 in.) with +/- 0.3 mm (0.01 in.) tolerance is standard. Other thicknesses are available on request
Maximum Window Size	Maximum window size is 500 mm x 660 mm (19.6 in. x 25.9 in.) (Depending on mesh angle)
Termination	Square or step finishes with Chomerics silver epoxy busbar and Chomerics SOFT-SHIELD® 5000 low closure force EMI gasket (Figure 1)
Part Numbering	Chomerics Part Numbers follow the format E-01-XXXXX and will be assigned by Chomerics
Temperature Range	-40°C to +75°C

LIGHT TRANSMITTANCE

The light transmittance for a shielded window is a composite result of the effect of the shielding media, which includes the mesh, the front and rear substrates, and the surface finish on the substrates. The following figures and tables demonstrate how visual transmission is determined from the finished window assembly.

Mesh Light Transmittance

Figure 3 shows the percentage of light transmission for several different types of mesh used in typical EMI shielded windows.

A = WIN-SHIELD™ Elite mesh
B = blackened copper 100 opi/0.0022 in. (0.06 mm) wire diameter
C = plain copper 100 opi/0.0022 in. (0.06 mm) wire diameter
D = blackened/plated stainless steel 80 opi/0.0012 in. (0.03 mm) wire diameter

Figure 2 Shielding Effectiveness for WIN-SHIELD™ Elite Windows

(Measured via a modified MIL-STD-285 test procedure, CHO-TM-TPO8, using a 14 in. x 14 in. open aperture)

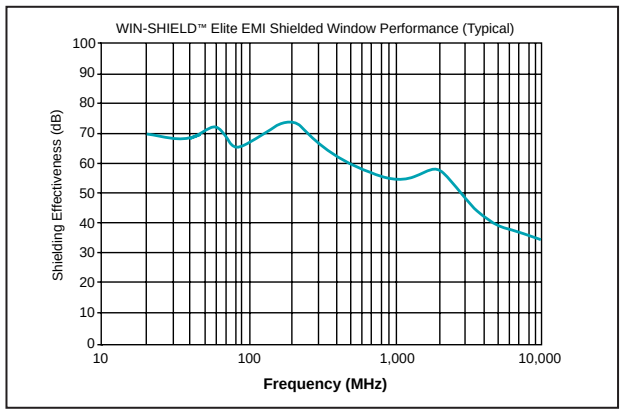
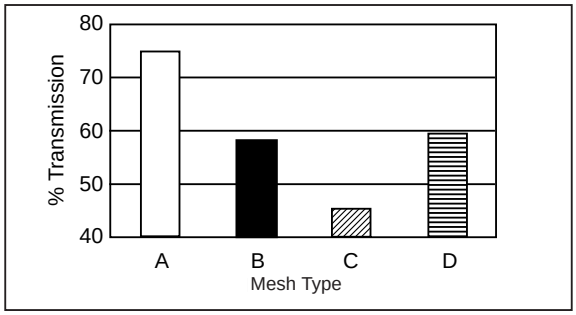


Figure 3 Mesh Light Transmittance



Substrate and Surface Treatment Light Transmittance

Table 2 shows the light transmittance of common shielded window substrates. Table 3 shows the light transmittance reduction for various surface finishes used on substrates for EMI shielding windows.

Table 2

SUBSTRATE LIGHT TRANSMITTANCE	
Substrate	**Light Transmittance**
Plain "float" glass	90-92%
Clear polycarbonate*	85-90%
Clear acrylic*	85-90%
Clear polyester*	83-88%

*varies with thickness due to internal dispersion

Table 3

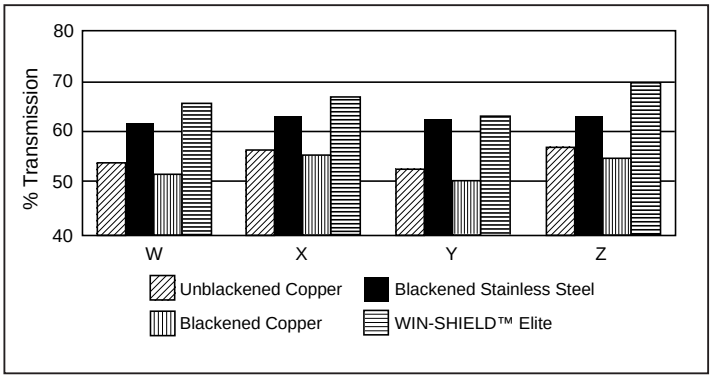
SURFACE FINISH LIGHT TRANSMITTANCE REDUCTION	
Surface Finish	**Light Transmittance Reduction**
Non-glare coatings (60-70 gloss)	2-3%
Non-glare coatings (80-90 gloss)	1%
Clear hard coat	<1%
MLAR* coating on glass	<1%

*multi-layer, anti-reflecting

Total Shielded Window Light Transmittance

Figure 4 details the actual light transmission of several types of EMI shielded windows, avoiding the common error of quoting the open mesh light transmission performance as that of the finished window.

Figure 4 Shielded Window Light Transmittance



W = EMI shielded window 0.64 mm (0.025 in.) thick with polycarbonate substrates, with non-glare coating on the front surface and clear hard coat on the rear surface

X = EMI shielded window 1.2 mm (0.047 in.) thick with glass substrates, plain finish to both front and rear surfaces.

Y = EMI shielded window 1.5 mm (0.059 in.) thick with polycarbonate substrates, with non-glare coating on the front surface and plain polycarbonate on the rear surface.

Z = EMI shielded window 1.2 mm (0.047 in.) thick with glass substrates, MLAR (multi-layer anti-reflecting) coating on the front surface and plain glass on the rear surface.