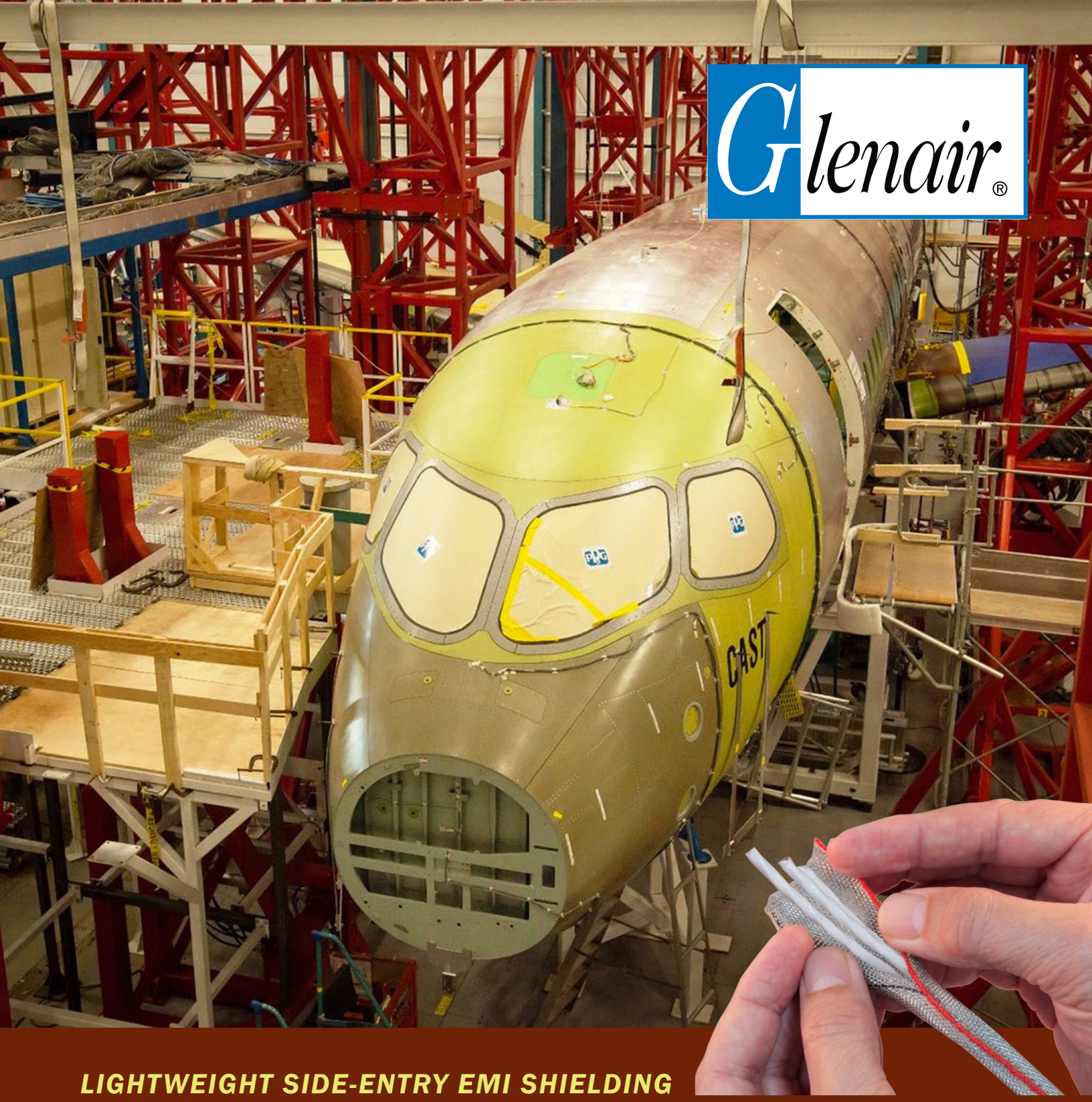


LIGHTWEIGHT SIDE-ENTRY EMI SHIELDING

MasterWrap™

ARMORLITE™ SELF-WRAPPING WIRE PROTECTION SAVES TIME AND WEIGHT

SEPTEMBER 2015

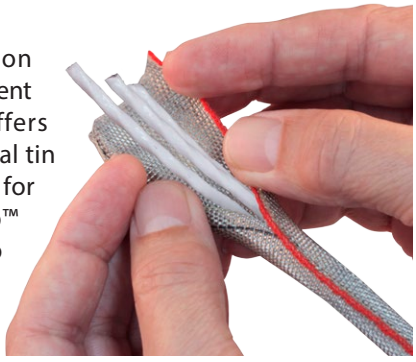
SERIES 103

MasterWrap™

Lightweight, side-entry EMI/RFI cable wrap with ARMORLITE™ technology

Tubular braided sleeving meets the broad range of shielding and mechanical protection requirements of aircraft harness assemblies. But the need to apply conductive shielding materials over installed aircraft wire and cable bundles requires new technology. Legacy self-wrapping cable braid has long been available for EMI/RFI applications and abrasion protection, albeit with poor high-frequency shielding performance due to its heavy weight, inflexibility, and windowing. MasterWrap™, a lightweight, easy-to-install, side-entry, self-wrapping shielding solution solves these problems and more. MasterWrap™ is ideally suited for both long-run wire harness protection as well as spot coverage and maintenance of EMC cable applications.

Glenair MasterWrap™ is both a weight reduction technolgy as well as an ease-of-assembly improvement for wire and cable protection. The material offers significant weight savings compared to traditional tin copper and nickel braid, and is already qualified for use at major aircraft manufacturers. MasterWrap™ adds flexibility and repairability capabilities to wire and cable harness applications traditionally shielded with tubular braid—from long runs to spot coverage and repairs.



- **Saves weight:** 70% material weight reduction compared to QQ-B-575 / A-A-59569 nickel copper
- **Simplifies installation:** Replaces harder-to-install tubular EMI/RFI sleeving
- **Saves time:** Fast and easy side-entry installation and removal
- **Improves EMI/RFI shielding:** Reduces windowing and coverage gaps
- **Improves mechanical performance:** Delivers superior flexibility, durability and repairability

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MASTERWRAP™

Flexible, lightweight EMI/RFI side-entry shielding

for spot coverage and repair of wire harness applications

MASTERWRAP™ KEY FEATURES AND PERFORMANCE

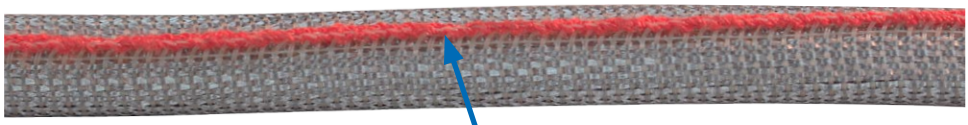
- Side-entry wrap-around design delivers outstanding EMI/RFI shielding with easy assembly and maintenance
- Core materials ideally suited for a broad range of temperature extremes from -65°C to 200°C
- Breakthrough weight reduction technology for electrical wire interconnect systems: up to 70% weight reduction compared to standard metallic EMI shielding
- High-frequency EMI shielding performance comparable to both standard metallic braid as well as lightweight tubular braid designs
- Halogen-free and RoHS compliant
- 500 hour salt spray corrosion resistance
- 50,000 cycle 90°–120° bend flex tested
- Outstanding caustic chemical and corrosive fluid resistance

MATERIAL CONSTRUCTION, SIZE COLOR CODING, AND HANDLING PERFORMANCE

- Flexible material eliminates kinking and windowing
- Spring members ensure shielding stays tight to wire bundle

Ultra-lightweight microfilament stainless steel core, conductively plated with nickel for outstanding shielding performance

MasterWrap™ is interwoven with high-temperature tolerant PEEK composite thermoplastic spring members that ensure up to 95% optical coverage

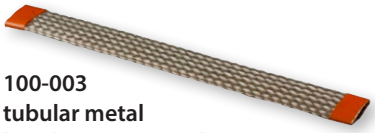


Color-coded MasterWrap size indicator

- Material design provides uniform surface with limited interference to structures and clamps during installation and routing
- Provides optimum surface coverage and adherence to bundle without buckling during both straight and angled routing
- Delivers increased abrasion protection with additional axial edge strength members compared to standard tubular braided shielding
- Reduces kinking and windowing compared to full metal braid solutions, and as a result delivers excellent shielding performance, particularly at high frequencies

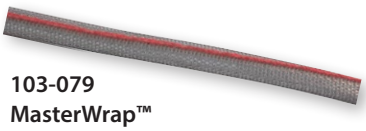
HERE'S WHAT YOU NEED TO KNOW ABOUT WEIGHT

Weight of standard metallic tubular braided cable shielding		
EMI Braided Shielding Type (measured samples all 1/2" diameter)	Weight g/ft	Weight g/m
Glenair nickel-clad copper braid	21.6	70.9
Raychem RAY-103-12.5 nickel-clad copper braid	21.9	72.0
Weight of lightweight tubular (LWB) braided cable shielding		
AmberStrand® 100%	3.7	12.1
AmberStrand® 75% / 25%	4.9	16.1
ArmorLite™ 100%	4.4	14.4
ArmorLite™ 75% / 25%	5.4	17.7
Raychem INSTALITE	13.4	44.0
Weight of side-entry self-wrapping braided cable shielding		
MasterWrap™	6.2	20.3
Federal Mogul ROUNDIT® EMI FMJ	18.0	59
Federal Mogul ROUNDIT® EMI C27 XWS	23.5	77



100-003
tubular metal braid ASTM B355 Class 4 OFHC nickel-plated copper

103-051
ArmorLite™ microfilament metal-clad stainless steel



103-079
MasterWrap™ side-entry braided shielding

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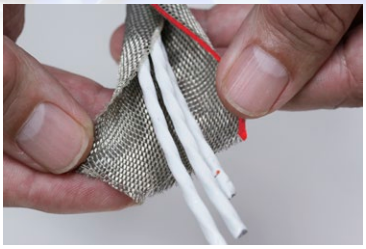
MasterWrap™

Made from ArmorLite™ lightweight microfilament stainless steel braid, plus thermoplastic (PEEK) spring members



Qualification Test Plan (QTP) QTP-405 summary results. For more information or for a copy of the full report, please contact the factory

Mechanical and Environmental Performance Summary		
Vibration	No evidence of wear or visible defect	DO-160G Cat S and H
Abrasion	No evidence of wear, visible defect or electrical degradation	EN-3475-511:2002
High Temperature Exposure	168 hours at 200°C; no visual or electrical degradation	EN 6059-302 part 302
Rapid Change of Temperature	10 hour hot and cold cycling; no evidence of wear or visible defect	EN 6059-308 part 308
Vertical Flammability	Pass	14 CFR part 25.853
Fluid Immersion Testing	No visual or electrical degradation	DO-160G
Bending Properties	25000 cycles; no breakage, no plating delamination	EN 6059-402
Salt Fog 500 Hours	No evidence of base metal on braid	ASTM B117-03 Sodium Chloride 5%

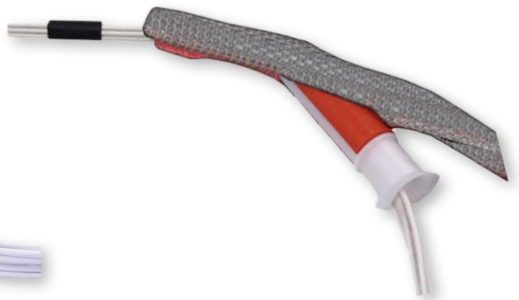
MasterWrap is compatible with most aerospace industry fluids. Consult factory for specifics.

AVAILABLE WIRE LOOM TOOL FOR EASY ASSEMBLY

Select size based on max bundle diameter

Part Number	Max Bundle Dia.
600-180-08	3/8 in (8mm)
600-180-15	5/8 in (15mm)
600-180-20	3/4 in (20mm)
600-180-25	1 in (25 mm)
600-180-32	1 1/4 in (32mm)

Easy to use: simply gather wire bundle into the tool…



…Insert tool and wires into MasterWrap and run through

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MASTERWRAP™

Flexible, lightweight EMI/RFI side-entry shielding

for spot coverage and repair of wire harness applications

MasterWrap™

WHAT YOU NEED TO KNOW ABOUT EMI/RFI SHIELDING PERFORMANCE

	NiCu	Armorlite™	Amberstrand®	MasterWrap™
TRANSFER IMPEDANCE (Per IEC 62153-4) (Max values for 1/2 inch diameter shields)				
FREQUENCY				
10 KHz	5 mΩ/m	50 mΩ/m	60 mΩ/m	40 mΩ/m
100 KHz	5 mΩ/m	50 mΩ/m	60 mΩ/m	40 mΩ/m
1 MHz	12 mΩ/m	50 mΩ/m	60 mΩ/m	40 mΩ/m
10 MHz	80 mΩ/m	50 mΩ/m	80 mΩ/m	40 mΩ/m
100 MHz	130 mΩ/m	30 mΩ/m	110 mΩ/m	80 mΩ/m
SHIELDING ATTENUATION (Per IEC 62153-4) (Min values for 1/2 inch diameter shields)				
FREQUENCY				
1 GHz	38 dB	55 dB	48 dB	40 dB
3 GHz	40 dB	60 dB	55 dB	35 dB
5 GHz	44 dB	60 dB	60 dB	45 dB
8 GHz	40 dB	50 dB	60 dB	40 dB
WEIGHT	154 g/m	14.4 g/m	12.1 g/m	20.3 g/m

The table at left is a useful summary of shielding performance for both QQ-B-575 / A-A-59569 NiCu as well as lightweight braid and MasterWrap™. Transfer impedance as well as shielding attenuation data is supplied for 1/2" diameter test samples. At high frequencies, both LWB and MasterWrap™ provide comparable and even superior performance to nickel-copper due to reduced windowing and superior optical coverage with significant reduction in weight. Further improvements in high-frequency shielding attenuation can be achieved using conductive tape wraps and/or via hybrid blends of LWB and NiCu.

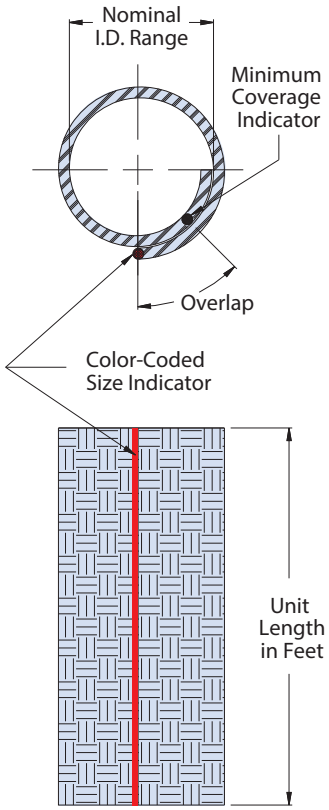
DIMENSIONAL INFORMATION • HOW TO ORDER

How to Order **103-079** **-024**

Product Series — Dash No (See Table 1)

Table I

Dash No	Nominal I.D. (Ref)	Reference Wire Bundle Range Nominal	Approximate Weight Grams/Ft.	Appoximate Milliohms per Meter	Min. Pull Strength (lbs)	Size Indicator color code
004	.125 (3.2)	.093 (2.4) .170 (4.3)	2.1	99.8	39	BLACK
008	.250 (6.4)	.170 (4.3) .300 (7.6)	4.0	52.2	75	BROWN
012	.375 (9.5)	.300 (7.6) .406 (10.3)	5.0	41.8	94	RED
016	.500 (12.7)	.406 (10.3) .520 (13.2)	6.2	34.0	116	ORANGE
020	.625 (15.9)	.520 (13.2) .675 (17.2)	8.7	24.2	158	YELLOW
024	.750 (19.1)	.675 (17.2) .825 (21.0)	10.6	20.0	193	GREEN
032	1.000 (25.4)	.825 (21.0) 1.100 (27.9)	12.9	16.4	237	BLUE
040	1.250 (31.8)	.938 (23.8) 1.312 (38.3)	17.4	TBD	TBD	VIOLET
048	1.500 (38.1)	1.187 (30.1) 1.590 (40.4)	21.2	TBD	TBD	GRAY
064	2.000 (50.8)	1.812 (33.0) 2.090 (53.1)	25.8	TBD	TBD	WHITE



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Out of This World

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