



Operation Semper Tan

The Complete “Desert Tan” Solution

United States ■ United Kingdom ■ Germany ■ France ■ Nordic ■ Italy ■ Spain ■ Japan

April 2011



Operation Semper Tan

Glenair: The Only Interconnect System Supplier to Offer Our Military Customer a Complete “Desert Tan” Solution

Glenair now offers a complete range of interconnect component materials suitable for use in military applications that require (or would prefer) FED-STD-33446 Desert Tan colored and conductive parts over other available colors such as CAD green or black. Materials and components successfully developed by Glenair now include cable jacketing, shrink boots, composite connectors and accessories, junction boxes, fabric cable braid, convoluted tubing, and more. The materials are intended for use on military vehicles, equipment trailers, soldier systems and other ground-based or ground-deployed applications.

OPERATION SEMPER TAN (XD) PRODUCTS

- ◆ Harsh Environment Cable Jacketing and Overmolding
- ◆ High-Temperature Heat Shrink Boots and Transitions
- ◆ Composite Thermoplastic Connectors and Accessories
- ◆ Rugged Fabric Cable Overbraid
- ◆ Annular Convoluted Tubing
- ◆ Corrosion-Proof Composite Junction Boxes
- ◆ Injection-Molded Cable Assemblies





Semper Tan Tubular Braid

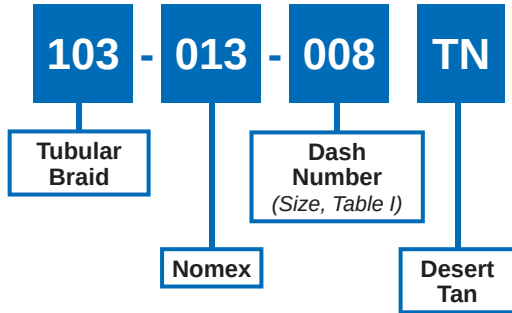


TABLE I				
Dash No.	Nominal I.D.	Wire Bundle Accomodation Range Ref.		
		Min.	Max.	
004	.125 (3.2)	.090 (2.3)	.250 (6.4)	
008	.250 (6.4)	.125 (3.2)	.375 (9.5)	
012	.375 (9.5)	.312 (7.9)	.500 (12.7)	
016	.500 (12.7)	.250 (6.4)	.750 (19.1)	
024	.750 (19.1)	.500 (12.7)	1.250 (31.8)	
040	1.250 (31.8)	.750 (19.1)	1.500 (38.1)	



Series 77 Full Nelson Desert Tan Shrink Boots

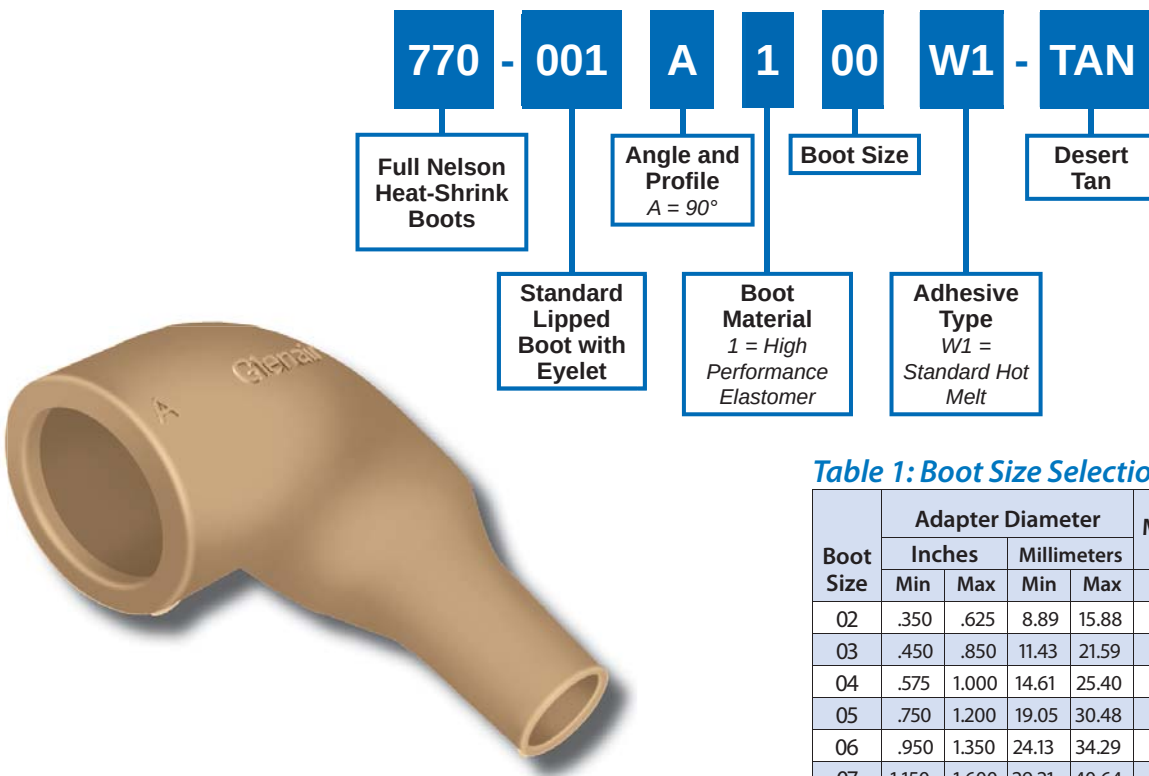


Table 1: Boot Size Selection Guide

Boot Size	Adapter Diameter				Min. Cable Diameter	
	Inches		Millimeters			
	Min	Max	Min	Max	In.	mm.
02	.350	.625	8.89	15.88	.175	4.45
03	.450	.850	11.43	21.59	.225	5.72
04	.575	1.000	14.61	25.40	.250	6.35
05	.750	1.200	19.05	30.48	.300	7.62
06	.950	1.350	24.13	34.29	.375	9.53
07	1.150	1.600	29.21	40.64	.425	10.80
08	1.600	2.000	40.60	50.80	.650	16.50
09	1.780	2.550	45.20	64.80	.700	17.80

Semper Tan Composite Junction Boxes

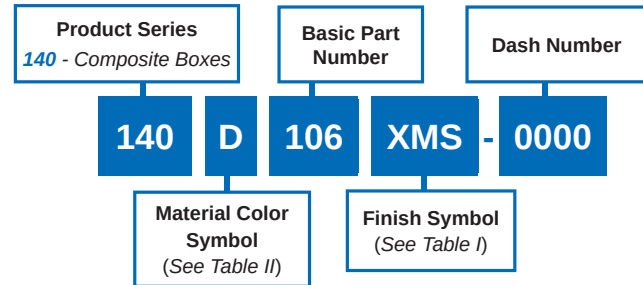


TABLE II: MATERIAL COLOR & FINISH OPTIONS

Sym	Material & Color	Finish Options
B	Thermoplastic / Black	XO and XMS
D	Thermoplastic / Desert Tan	XO and XMS
G	Thermoplastic / Grey	XO and XMS
-	Thermoplastic / NA	XM, XW and XZN

TABLE I: FINISHES

Symbol	Finish Description
XO	No Plating (Non-Conductive Finish)
XMS	Internal Surfaces - Electroless Nickel External Surfaces - See Table II
XM	All Surfaces – Electroless Nickel
XW	All Surfaces – Cadmium Olive Drab over Electroless Nickel
XZN	All Surfaces – Zinc Nickel/Black
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. 1000 Hour Grey™

Semper Tan D38999 Series III Composite Protective Covers

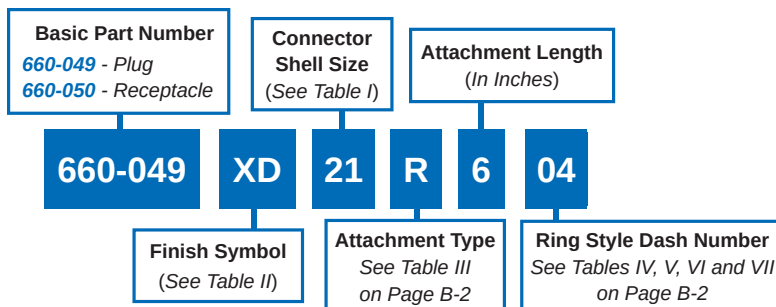


TABLE I: CONNECTOR SHELL SIZE ORDER NUMBER

SHELL SIZE	A THREAD	B DIA MAX	C DIA MAX
09	.6250 -0.1P-0.3L-TS	.906 (23.0)	.906 (23.0)
11	.7500 -0.1P-0.3L-TS	1.024 (26.0)	1.102 (28.0)
13	.8750 -0.1P-0.3L-TS	1.220 (31.0)	1.220 (31.0)
15	1.0000 -0.1P-0.3L-TS	1.300 (33.0)	1.260 (32.0)
17	1.1875 -0.1P-0.3L-TS	1.457 (37.0)	1.457 (37.0)
19	1.2500 -0.1P-0.3L-TS	1.575 (40.0)	1.535 (39.0)
21	1.3750 -0.1P-0.3L-TS	1.732 (44.0)	1.654 (42.0)
23	1.5000 -0.1P-0.3L-TS	1.811 (46.0)	1.772 (45.0)
25	1.6250 -0.1P-0.3L-TS	1.969 (50.0)	1.929 (49.0)

TABLE II

Symbol	Finish Description
XB	Black Color - No Plating (Non-Conductive Finish)
XD	Desert Tan Color - No Plating (Non-Conductive Finish)
XMD	Desert Tan Color - External Surfaces Electroless Nickel - Internal Surfaces
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. 1000 Hour Grey™
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

Semper Tan Composite Connectors

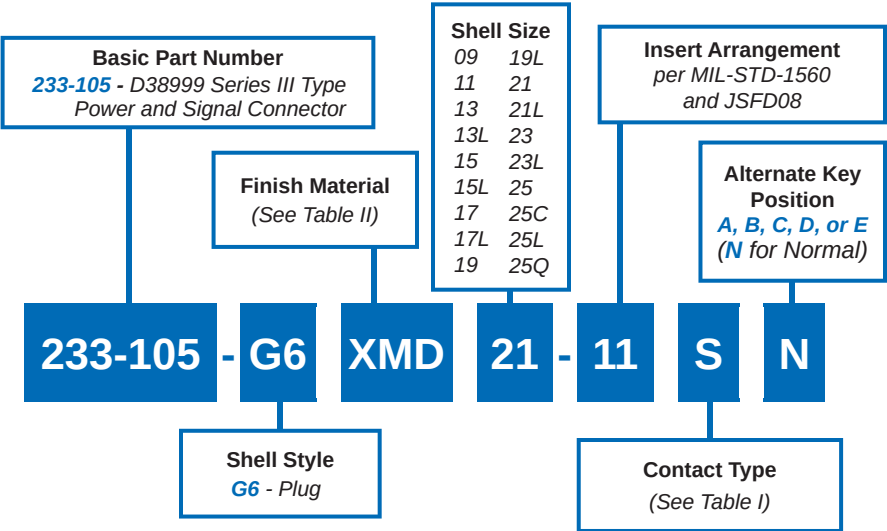


TABLE III: SHELL SIZE				
Shell Size Code	Shell Size	CC Max Dia	DD Max Dia	EE Thread
A	09	.811 (20.6)	.858 (21.8)	M12 x 1.0-6g 0.100R
B	11	.929 (23.6)	.984 (25.0)	M15 x 1.0-6g 0.100R
C	13	1.110 (28.2)	1.157 (29.4)	M18 x 1.0-6g 0.100R
D	15	1.232 (31.3)	1.280 (32.5)	M22 x 1.0-6g 0.100R
E	17	1.358 (34.5)	1.406 (35.7)	M25 x 1.0-6g 0.100R
F	19	1.469 (37.3)	1.516 (38.5)	M28 x 1.0-6g 0.100R
G	21	1.594 (40.5)	1.642 (41.7)	M31 x 1.0-6g 0.100R
H	23	1.720 (43.7)	1.768 (44.9)	M34 x 1.0-6g 0.100R
J	25	1.843 (46.8)	1.890 (48.0)	M37 x 1.0-6g 0.100R

TABLE II: FINISH		
SYM	MATERIAL	CONDUCTIVE ELEMENTS
XMD	Desert Tan Composite	Electroless Nickel
XMTD	Desert Tan Composite	Ni-PTFE 1000 Hour Grey™
XWD	Desert Tan Composite	Cadmium O.D. Over Electroless Nickel

*Consult Factory for Additional Plating Options

Semper Tan Composite Shrink Boot Adapters

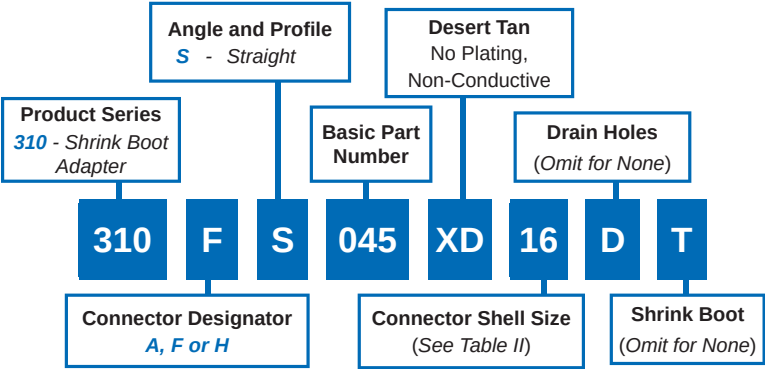


TABLE II: SHELL SIZE				
Shell Size		E Max	F Max	Cable Entry Min.
A, F	H			
08	09	.533 (13.5)	.940 (23.9)	.250 (6.4)
10	11	.605 (15.4)	.940 (23.9)	.355 (9.0)
12	13	.774 (19.7)	.940 (23.9)	.491 (12.5)
14	15	.838 (21.3)	.940 (23.9)	.565 (14.4)
16	17	.963 (24.5)	.940 (23.9)	.690 (17.5)
18	19	1.042 (26.5)	.940 (23.9)	.769 (19.5)
20	21	1.217 (30.9)	.940 (23.9)	.894 (22.7)
22	23	1.355 (34.4)	.940 (23.9)	1.019 (25.9)
24	25	1.443 (36.7)	.940 (23.9)	1.134 (28.8)

Semper Tan Overmolded Cables

Glennair now offers high-performance cable jacketing and overmolding materials that provide outstanding, damper-proof environmental protection for cables and conduit used in harsh application environments. The materials are ideally suited for high-heat environments (up to 200° C continuous) and withstand all common forms of caustic chemicals and fuels per MIL STD 810F, Method 4. The material conforms to additional military performance requirements such as accelerated UV weathering per IEC 60068-2-5 and is halogen free and flame resistant per IEC 60614-1.



Semper Tan EMI-RFI Shielded and Jacketed Metal-Core Conduit Assembly

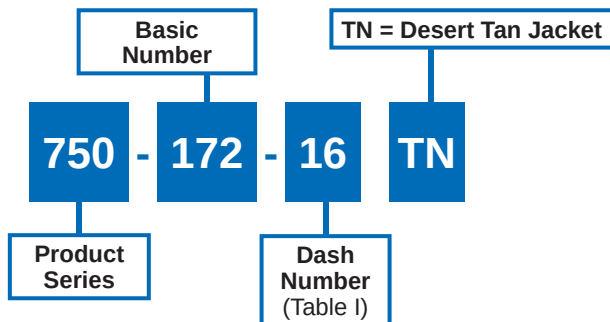


Table I		
Dash No	A Dia $\pm .015$ (0.4) $-.000$ (0.0)	B Dia $\pm .03$ (.8)
06	.187 (4.7)	.44 (11.2)
08	.250 (6.3)	.52 (13.2)
09	.281 (7.1)	.56 (14.2)
12	.375 (9.5)	.64 (16.3)
16	.500 (12.7)	.77 (19.6)
20	.625 (15.9)	.89 (22.6)
24	.750 (19.1)	1.03 (26.2)
32	1.000 (25.4)	1.28 (32.5)
40	1.250 (31.8)	1.65 (41.9)
48	1.500 (38.1)	1.88 (47.8)
64	2.000 (50.8)	2.40 (61.0)
80	2.500 (63.5)	2.86 (72.6)

Semper Tan EMI/RFI Helical Tubing Assembly

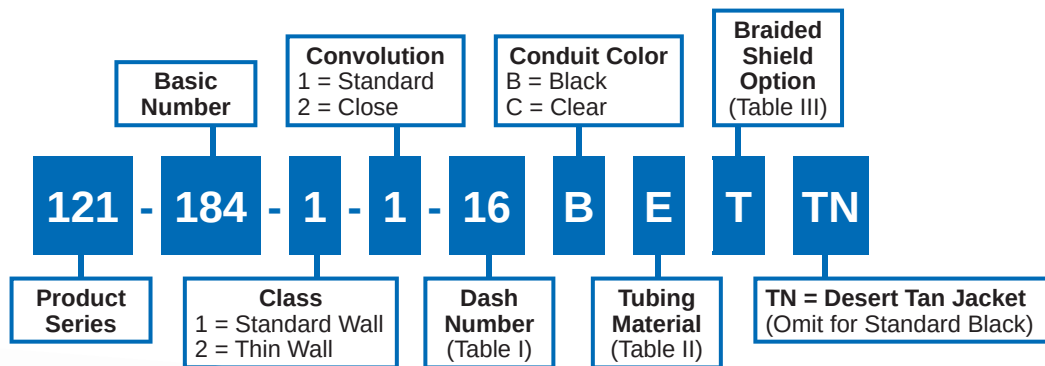


Table II	
Sym	Tubing Material
E	ETFE, Tefzel
F	FEP, Teflon
K	PEEK
P	PFA, Teflon

Table III	
Sym	Braided Shield
B	Bronze
C	Stainless Steel
N	Nickel Copper
S	SnCuFe
T	Tin Copper

Table I				
Dash No	Fractional Size Ref	A Inside Dia		B Dia Max
		Min	Max	
06	3/16	0.181 (4.6)	0.188 (4.8)	0.490 (0.5)
09	9/32	0.273 (6.9)	0.281 (7.1)	0.584 (0.6)
10	5/16	0.306 (7.8)	0.312 (7.9)	0.620 (0.6)
12	3/8	0.359 (9.1)	0.375 (9.5)	0.680 (0.7)
14	7/16	0.427 (10.8)	0.437 (11.1)	0.741 (0.7)
16	1/2	0.480 (12.2)	0.500 (12.7)	0.820 (0.8)
20	5/8	0.603 (15.3)	0.625 (15.9)	0.940 (0.9)
24	3/4	0.725 (18.4)	0.750 (19.1)	1.000 (1.0)
28	7/8	0.860 (21.8)	0.875 (22.2)	1.243 (1.2)
32	1	0.970 (24.6)	1.000 (25.4)	1.396 (1.4)
40	1 1/4	1.205 (30.6)	1.250 (31.8)	1.709 (1.7)
48	1 1/2	1.437 (36.5)	1.500 (38.1)	2.002 (2.0)
56	1 3/4	1.688 (42.9)	1.750 (44.5)	2.252 (2.3)
64	2	1.937 (49.2)	2.000 (50.8)	2.502 (2.5)

Master Seal Self-Vulcanizing Sealing Tape

Glenair *Duralectric*™ weatherproof jacketing is halogen free, flame resistant, and functional to 260°C. *Duralectric*™ far surpasses the accelerated solar weathering standards under IEC 60068-2-5, and is tested to 56 accelerated days, equivalent to 53 years of solar exposure. Glenair can supply the material in a variety of formats, including blown jacketing, as an extrusion over wire and cable, as an overmolding compound and as a self-vulcanizing “stretch-to-activate” repair tape.

Originally qualified to the US navy Mil-PRF-24758A specification, *Duralectric*™ is available in standard US Navy haze gray in accordance with Fed Std 595B #26270. Other colors are also standard including black, and Fed Std #3446 Desert Tan. Additional Made-to-Order colors are available. The material has the following performance characteristics:

GLENAIR *Duralectric*™ MATERIAL SPECIFICATIONS

Temperature rating: -70°C to +200°C (with excursions to 260°C)

Halogen free per IEC 60614-1. Less than 5mg of HCl per 1 gm of product tested.

Accelerated Weathering (Solar) per IEC 60068-2-5; 56 days exposure

Flame Resistant per IEC 60614-1; Material does not sustain combustion when the source of flame is removed.

Low Smoke Index per NES 711 (11.75); Minimum standard is 25. The Glenair tested level is 11.75. This makes the material acceptable for interior applications as well as topside.

Smoke Density Class F1 Per NF F 16-101 IAW DIN EN 60695-2-11:2001

Toxicity Index per NES 713 (1.9); Minimum standard is 5. The Glenair tested level is 1.9. This makes the material acceptable for interior applications as well as topside.

Colorable to Fed Std 595B

Markable IAW MIL-PRF-24758A

Oxygen Limiting Index = 45.1 Per EN ISO 4589-2:1999; Minimum is 28.

12 Sec Vertical Burn: (Pass) Per 14CFR Part 25.853(a) amdt 25-116 App F Part 1 (a)(1)(ii)

Fluids Per MIL STD 810F, Method 504

Fuel (MIL-T-83133): JPG

Hydraulic Fluid (MIL H 5606): ROYCO 756

Lube Oil (MIL-L-23699): ROYCO-500

Cleaner (MIL-C-85570): CALLA-855

Solvent (Isopropyl Alcohol): TT-I-735

De Icer (AMS-1432): E36 Runway Deicer

Coolant (MIL-C-87252): Coolanol 25R

Fire Extinguishant Foam: AMEREX AFFF



**MASTER
SEAL** Self-Vulcanizing
Sealing Tape

GLENAIR PART NO.
687-758 T

***Duralectric**™ material sealing tape designed for temporary repair of cable and conduit. Glenair Master Seal effectively stops water incursion until a permanent repair can be made.*

SEMPER TAN

The Permanent FED-STD-33446 Desert Tan Solution



Maintenance-Free Desert Tan Cables, Conduits, Junction Boxes and More

The parts shown on these pages are just examples of the unlimited range of Desert Tan interconnect solutions supplied by Glenair. Please don't hesitate to ask the factory for guidance on converting virtually any interconnect component or system to Semper Tan—the permanent FED-STD-33446 Desert Tan solution that eliminates the costly labor of manually painting and maintaining standard cables, conduit assemblies, and junction boxes used in military applications. Recently, one of our customers requested a Semper Tan version of our popular high-temperature annular tubing (hylar or trade name Kynar). Glenair was able to produce the product shown below in just a few short weeks and it is now being used in a military vehicle application. Please consult the factory for this and other innovative Semper Tan solutions.



***Hylar (trade name
Kynar) Semper Tan
annular tubing***