

# Series Specifications

TB Series • MIL-DTL-38999 Series IV Style Accessories

## Performance Specifications

Built to meet or exceed MIL-DTL-38999 specifications  
Guaranteed fully compatible and interchangeable with respect to physical and performance characteristics with all existing MIL-DTL-38999 Series IV commercial, military, NASA, ESA (European Space Agency) derivatives

## Environmental Characteristics

### Temperature Range

-85° to +392°F (-65° to +200°C)

Service life varies with the maximum internal hot spot temperature resulting from any combination of electrical load or ambient temperature:

77°F (25°C): Continuous

221°F (105°C): 45,000 hours

392°F (200°C): 1,000 hours

### Water Pressure

IP67 rating (environmental sealing) when used in conjunction with proper sealing accessories  
Fully submersible to 3.3 ft (1m) for minimum of 30 min

### Air Leakage Rate

#### Environmental

Air leakage not to exceed 1 inch<sup>3</sup>/hr (4.55 x 10<sup>-3</sup> cm<sup>3</sup>/sec) at 30 psi (2.11 kg/cm<sup>2</sup>) pressure differential with all contact cavities filled

#### Hermetic

Helium leakage not to exceed 0.01 micron per ft<sup>3</sup>/hr (1.0 x 10<sup>-6</sup> cc<sup>3</sup>/sec) at 15 psi (1.1 kg/cm<sup>2</sup>)

Hermetic inserts rated up to 14,000 psi (984 kg/cm<sup>2</sup>) when precision welded or solder mounted

### Thermal Vacuum Outgassing

Outgassed at high vacuum (5 x 10<sup>-5</sup> torr) for 48 hours at 350°F (176°C); components shall not release greater than 1.0% total mass loss (TML) and 0.1% collected volatile condensable material (CVCM)

### Salt Spray Rating

See Materials & Finishes, p. S-13

### Humidity

Mated connectors shall maintain an insulation resistance of 100 megohms or greater at 77°F (25°C) with 95% humidity for duration of 20 days

### Chemical Resistance to Fluids

20-hour full immersion (unmated) in hydraulic fluid and lubricating oil without damage or material degradation

### Lightning Strike Resistance

Per EIA/ECA-364-75, mated connectors with full wire braid shield assembly will show resistance to indirect lightning strike with the following peak currents (amps):

Aluminum & Stainless Steel Shells: 10,000A

Composite Shells: 6,000A

## Physical Characteristics

### Coupling

Breech-lok coupling; quick-disconnect mechanism distributes coupling load over solid metal lands, internal drive threads offer mechanical advantage required to engage contacts and seals.

### Scoop-Proof

Shell design is 100% scoop-proof to prevent contact raking in blind-mate applications

### Insert Arrangements

51 standard, custom inserts available

### Alternate Keying

270° engagement rotation available, with 10 different polarizations

## Endurance Characteristics

### Coupling Cycles

500 coupling cycles (minimum)

### Shock

Half-sine wave with 300g's (±15%) magnitude with duration of 3 milliseconds with less than 1 microsecond maximum discontinuity with no cracking, loosening of parts, or other failures

### High-Impact Shock

Per MIL-S-901, a 400 lbs (181 kg) hammer dropped onto assembly from height of 1 ft (30 cm), 3 ft (91 cm), and 5 ft (152 cm) applied to connector assembly in 3 axes, totaling 9 impacts, connector assembly experienced less than 1 microsecond maximum discontinuity with no cracking, loosening of parts, or other failures

### Sine Vibration

30g at ambient temperature

### Random Vibration

50g at ambient temperature

## Material Characteristics

### Shell

#### Environmental

Aluminum, solid, one piece, seamless construction  
Stainless Steel, solid, one piece, seamless construction  
Composite, solid, one piece, seamless construction

#### Hermetic

Stainless Steel, solid, one piece, seamless construction

### Shell Plating (Standard Finishes)

#### W Finish

Electrically conductive cadmium plate finish with an olive drab chromate after-treat for additional corrosion resistance (500 hr salt spray rating)

#### N, G Finish

Electrically conductive electroless nickel plating (48 hr salt spray rating)

#### K Finish

Passivated  
(1,000 hr salt spray rating)

### RFI Grounding Fingers

Beryllium copper alloy or stainless steel

### Shell Conductivity (Standard Finishes)

Per MIL-STD-1344, method 3008, maximum conductivity potential drop shall not exceed the following:

#### W Finish

2.5 millivolts across assembly shell-to-shell  
5.0 millivolts across assembly shell-to-braid

#### N, G, K Finishes

1.0 millivolts across assembly shell-to-shell  
3.5 millivolts across assembly shell-to-braid

#### HA, HB Finishes

10.0 millivolts across assembly shell-to-shell  
15.0 millivolts across assembly shell-to-braid

### Magnetic Permeability

Less than 2.0 mu when measured to EIA-364-54

### Insert

Glass filled liquid crystal polymer (LCP)  
Non-removable and mechanically bonded to shell

### Hermetic Insert

Vitreous (glass compression)  
Non-removable and mechanically bonded to shell

### Protective Cover Chain

Passivated stainless steel, wire rope able to withstand a 25 lb (11.3 kg) tensile force without damage

### Adhesives

RTV and epoxies

### Grommet, Peripheral Seal, O-Ring, & Interfacial Seal

Blended fluorosilicone (70%) and silicone (30%) elastomer

## Contact Characteristics

### Contact Design

#### Environmental

Removable, rear-release crimp contacts

#### Hermetic

Solder style, permanently bonded to insert

### Contact Sizes

#8 (Coax, Twinax), #12, #16, #20, #22D

### Contacts Crimp

Beryllium copper alloy, per ASTM B197

### Contacts Hermetic

Nickel-iron (Type 52 alloy), per ASTM F30

### Contact Plating

#### Standard Crimp

Gold plate over nickel, 50 μinches (1.27 μm) minimum

#### High-Cycle Crimp

Gold plate over nickel, 150 μinches (4.00 μm) minimum

#### Hermetic

Gold plate over nickel, 50 μinches (1.27 μm) minimum

### Socket Contact Hood

Stainless steel, passivated

### Max Number of Contacts

128 x #22D contacts standard, custom inserts available

### Max Contact Resistance

Size #22D: 14.6 milliohm maximum  
Size #20: 7.3 milliohm maximum  
Size #16: 3.8 milliohm maximum  
Size #12: 1.7 milliohm maximum

### Max Voltage Drop

#### Crimp Contacts

<73 millivolt maximum drop (initial)

#### Hermetic Contacts

<85 millivolt maximum drop (initial)

### Contact Retention

Up to 25 pounds, all finish classes

## Electrical Characteristics

### Current Rating

23 amps (test current) at 68°F (20°C)

### Max Operating Voltage

900 VAC (RMS) at sea level

### Insulation Resistance

>5,000 megohms at 77°F (25°C)

### Wire Size

12 to 28 (AWG)

### Wire Sealing Range

Designed for individual wire sealing  
Sealing is only guaranteed if wires meet MIL-W-5086 or within permitted ranges