



HERMETIC INTERCONNECT SOLUTIONS

Perfect connections for
mission critical applications

Who we are and what we do

Martec is a leader in the design and manufacture of hermetic interconnect solutions.

We are at the forefront of technological and materials expertise for mission critical applications required to maintain system integrity while operating in harsh or hostile environments.

Perfect connections for mission critical applications

Exceptionally high strength

Up to 90,000 psi / 600 Mpa

Compact

From <3mm long

Exotic material options

Titanium, Hastelloy, Inconel

High temperature operation

From -55°C to 350°C

Fire wall capabilities to 1,000°C

AS9100 accredited

Air & gas impervious

Maintain fluid separation

Mouldability

Custom form factors plus
Mil-Spec equivalents

Superior leak rate performance

$1 \times 10^{-7/8/9/10}$ cc/sec

Design
leaders in
glass to
metal seal
technology

martec[®]
an Amphenol[®] company

Mission Critical Connections



Commercial Aerospace

- Actuators
- Sensors: proximity, pressure & temperature
- Engine & fuel system applications



Military

- Ignition & weapon release systems
- Sensors: proximity, pressure, temperature & speed
- Vision systems



Industrial & Automotive

- Condition monitoring: humidity & gas sensors
- Sensors: vibration, pressure and temperature
- Spectrometers: airport trace detection devices



Medical

- Titanium hermetics for implantable medical devices
- Electrical feedthroughs for Medical Autoclaves
- Hermetic vacuum feed through for digital imaging.



Oil & Gas

- Wire line tools (measurement/logging whilst drilling)
- Containment seal/fire barrier
- Sub-sea cable termination & condition monitoring



Space

- Imaging systems
- Cryogenic cooling
- Ignition systems

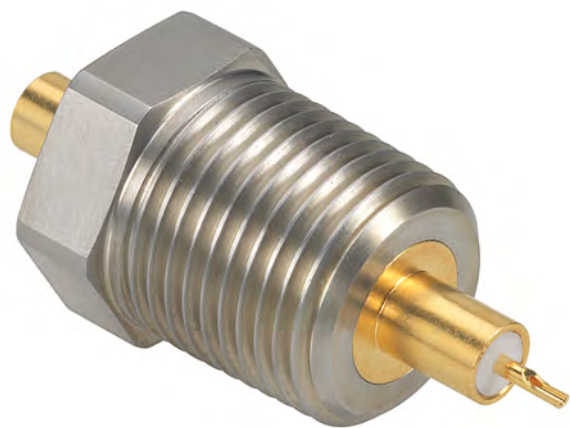
Coax Series

Martec's impedance matched coaxial connectors can be supplied in hermetic designs to meet standard impedance requirements of 50 or 75 Ω . Alternatively, we can provide bespoke designs to suit your system requirements of a non-standard impedance level, to ensure optimal system performance.

Our connectors are supplied in industry standard form factors, such as BNC, SMA, SMB and N types, and are produced in a variety of materials to meet your specifications. These include stainless steel and titanium with a choice of electroplated finishes, as well as selective plating options to optimise earth bonding.

Features

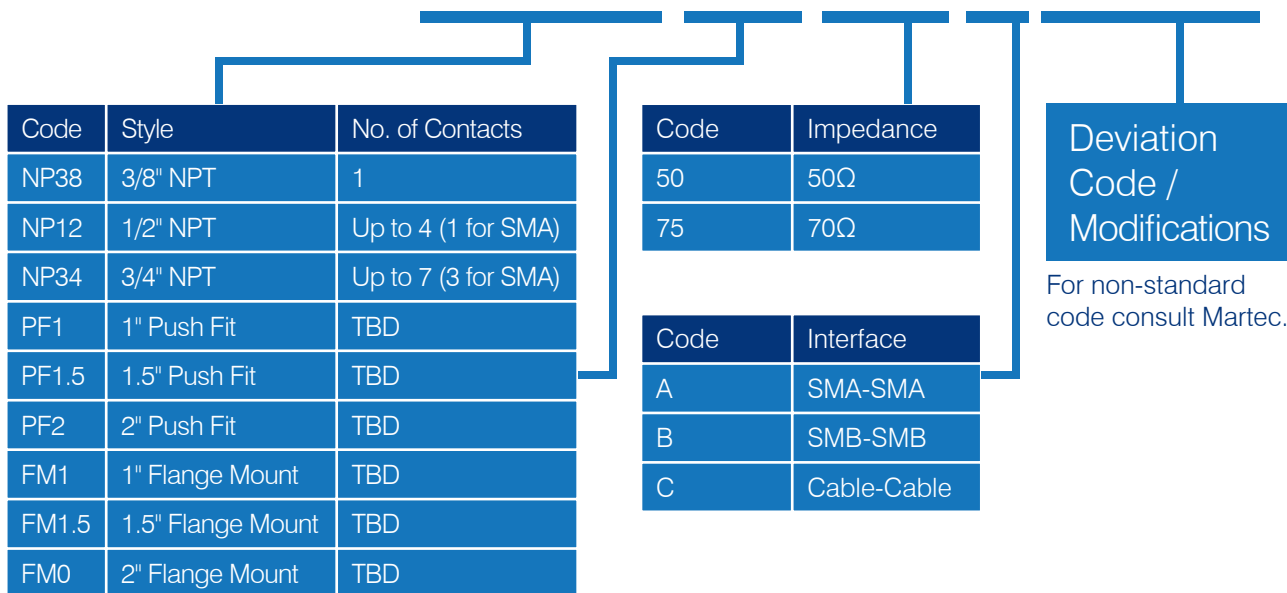
- Matched impedance variants - 50/75 Ω
- Stainless steel / Inconel construction
- Pressure rating up to 40,000 psi
- Screen - grounded or floating options
- Cable flyhead variants
- 'S' parameters available for specific variants
- Different housing options available





Part Number Builder

M-COAX-XXXX-XX-XX-X(XXX)



Note: Cables used by default where specified are RG178 for 50Ω and RG59 for 75Ω assemblies. Please contact us for any other combinations or requirements.

Rectangulars

Martec's rectangular connectors can be supplied in a variety of formats and material combinations to match customers' stringent customised requirements. Rectangular devices are suitable for interfacing compact enclosures. To ensure optimal integration Martec can design tailored solutions including D-Sub or Micro D, or offer complete customisation. Connectors can be designed and manufactured to meet individual environmental, mechanical or installation requirements.

With high density pin counts and various termination types available, these connectors are used in critical, harsh environment applications for reliable data transfer. Martec's custom approach means that it is possible to produce optimised connectors with customised fitments. These provide greater flexibility and options include high conductivity pin contacts, in-shell signal conditioning and high reliability mounting methods.

Features

- Custom fitments for critical, high performance system applications
- High density pin count (to 0.050" pitch)
- Hermetic sealing
- High pressure capability
- High conductivity and low resistivity for high data rates
- Wide operating temperature range (typically -40 to +170 °C)
- MIL-DTL 83513 (Micro D) and 24308 (D Sub) types





Part Number Builder

M-REC-X-X-XX-(XXX)

Standards

- A (MIL-DTL-83513 Type) Micro D
- B (MIL-DTL-24308 Type) D Sub

Deviation Code / Modifications

For non-standard code consult Martec.

Shell Size

- D1
- D2
- D3
- D4
- D5
- MA
- MB
- MC

Number of Contacts

- 9
- 15
- 25
- 37
- 50

Contact Style

- PC PC Tail
- SB Solder Bucket
- SN Socket



M12

These connectors are miniature threaded, hermetically sealed connectors that are designed to meet and exceed the mechanical and environmental requirements IEC-61076-2-101 with fixed pin contacts, fused into a glass dielectric insert. These connectors are available as receptacle with eyelet, solder bucket and/or pcb contacts.

Construction

Standard Hermetic connectors are sealed by fusing a single piece glass insert into a machined Stainless Steel Shell. The pin contacts are permanently fused into the insert. To maintain thermal compatibility with the glass insert, the contacts are manufactured from a nickel alloy. The protective plating on the pin contacts is electro-deposited gold over nickel. The Jam Nut is supplied with a fluorousilicone rubber O-ring for panel sealing. All Martec M-M12 hermetic connectors are RoSH compliant.

Contact Terminals

Eyelet



PCB



Solder Bucket

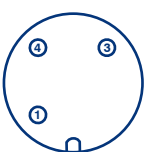


Rounded

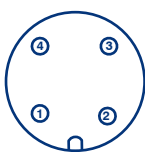


Inserts

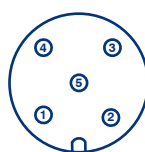
3 Pin



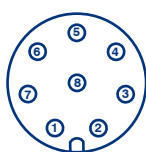
4 Pin



5 Pin



8 Pin



Technical Specification

Mechanical

Shell: Stainless Steel

Insulator: Glass

Contacts: Nickel alloy

Contact Plating: Gold over Nickel

Electrical

Insulation Resistance:
100 MΩ @ 500VDC

Contact Rating:
#20, 2 amps per contact

Hermeticity

Leakage rate of less than 1×10^{-8} cc/sec at one atmosphere pressure differential.

Pressure

The standard hermetic connector is not designed as a pressure resistant connector even though the inserts are capable of withstanding high pressure differentials. For specific pressure critical applications please consult us.

Temperature Tolerance

-55°C to 175°C. Higher temperature material options are available.



Part Number Builder

M-M12-X-XX-P-X(XXX)

Shell Style

- A Round Flange
- B Square Flange
- C Jam Nut
- D Through Flange

Insert

- 03 Three Pin
- 04 Four Pin
- 05 Five Pin
- 08 Eight Pin

Deviation Code / Modifications

For non-standard code consult Martec.

Contact Termination

- 2 Eyelet
- 3 Solder Bucket
- 4 PCB
- 5 Rounded
- 6 Special (Dev)

Contacts

P Pins

Subsea Booted Connectors

The Martec SBC feedthrough range has been developed for mission critical subsea and downhole instrumentation applications. The push on key located boot-plug and receptacle design allows on-site or workshop harnessing using simple handheld crimp tools.

Features

- Booted plug provides an alternative to hard wiring ideal for applications requiring periodic maintenance.
- Boot provides a robust and reliable retention of plug to the receptacle, suited to harsh environments.
- Field Installation.
- 15 Kpsi (1,000 Bar) pressure tight hermetic glass sealed receptacle.
- Weld mountable receptacle or custom housed.
- Seawater-tight boot with individual pressure energised wire seals, no need for gels or grease.
- Crimp contacts for 22 AWG wire (field installed or factory preassembled)

Plug Terminations

Wires are terminated using the crimp contacts supplied with the booted connector.

Housing Installation

The receptacle is designed to be welded into a housing using an axial electron beam weld. For welding guidance, please consult Martec. Alternative options are available including a radial weld installation and O-ring sealed version. Please contact Martec to discuss

Environmental/Mechanical Specification

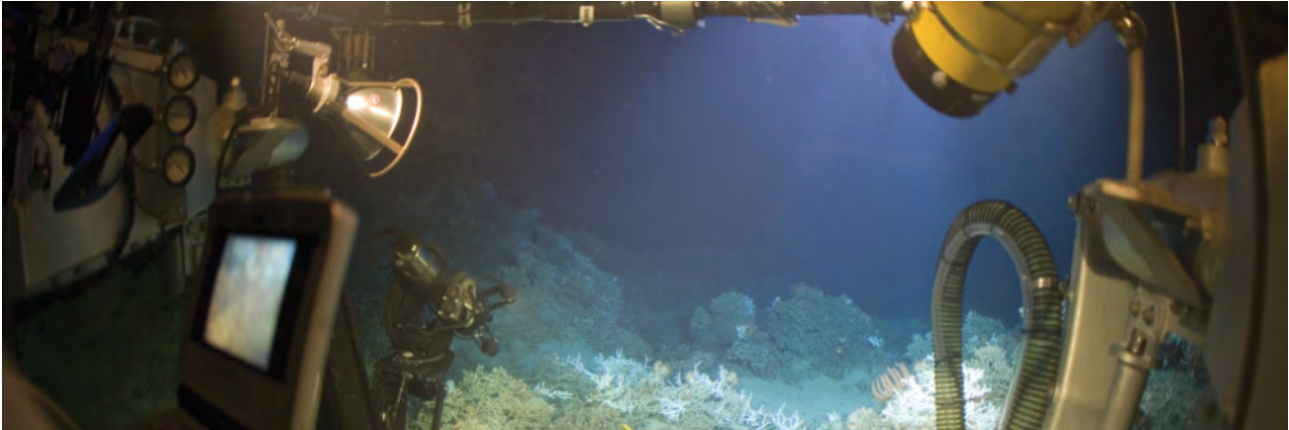
Plug Pressure Rating	6,000 psi (410 Bar)
Depth	13,100 ft (4,000m)
Test Pressure ^a	6,400 psi (441 Bar)
Receptacle Pressure Rating	15,000 psi (1,034 Bar)
Test Pressure ^b	22,500 psi (1,550 Bar)
Leak rate	< 1 x10 ⁻⁸ cc/sec @ 1atm
Temperature Rating	See Material Specification table
Suitable Wire type	22AWG Outer O .0411 / .0461" (1.04 /1.17mm)

^a Tested with NBR (Option 1) boot. ^{a+b} Both tests were conducted at ambient temperature.

Electrical Specification

No of ways	4
Insulation Resistance @ 20°C	> 1GΩ @ 50Vdc
Dielectric Strength @ 20°C	> 1kV @ 1mA leakage
Max current per pin	2A
Contact resistance	<2.5mΩ





Part Number Builder

M-SBC-X-X-X(XXX)

Boot Materials

- 1 Nitrile (NBR)
- 2 Viton® (FKM)
- 3 Hydrogenated Nitrile (HNBR)
- 4 EPDM

No of Ways

- 1 4 Way
- 2 8 Way

Insert

- 1 Solder Bucket
- 2 Straight Rounded pin
- 3 PCB Shoulder Pin

Deviation Code / Modifications

For non-standard code consult Martec.

Material Specification

Plug		Operating Temperature		
Boot [‡]	Option 1	Nitrile (NBR)	-4 to 212°F	-20 to 100°C
	Option 2 [‡]		4 to 392°F	-20 to 200°C
	Option 3 [‡]		-22 to 257°F	-30 to 125°C
	Option 4 [‡]		-67 to 266°F	-50 to 130°C
Insert	PEEK			
Contacts	Gold plated copper alloy & Stainless Steel 304 ferrule.			
Location Pin	Stainless Steel 316L			

[‡] All material options stated are sea water chemically compatible. Please contact Martec to discuss specific chemical compatibility requirements

[‡] These materials are subject to qualification.

[‡] Select for ozone tolerant marine surface use.

High Temperature High Pressure (HTHP)

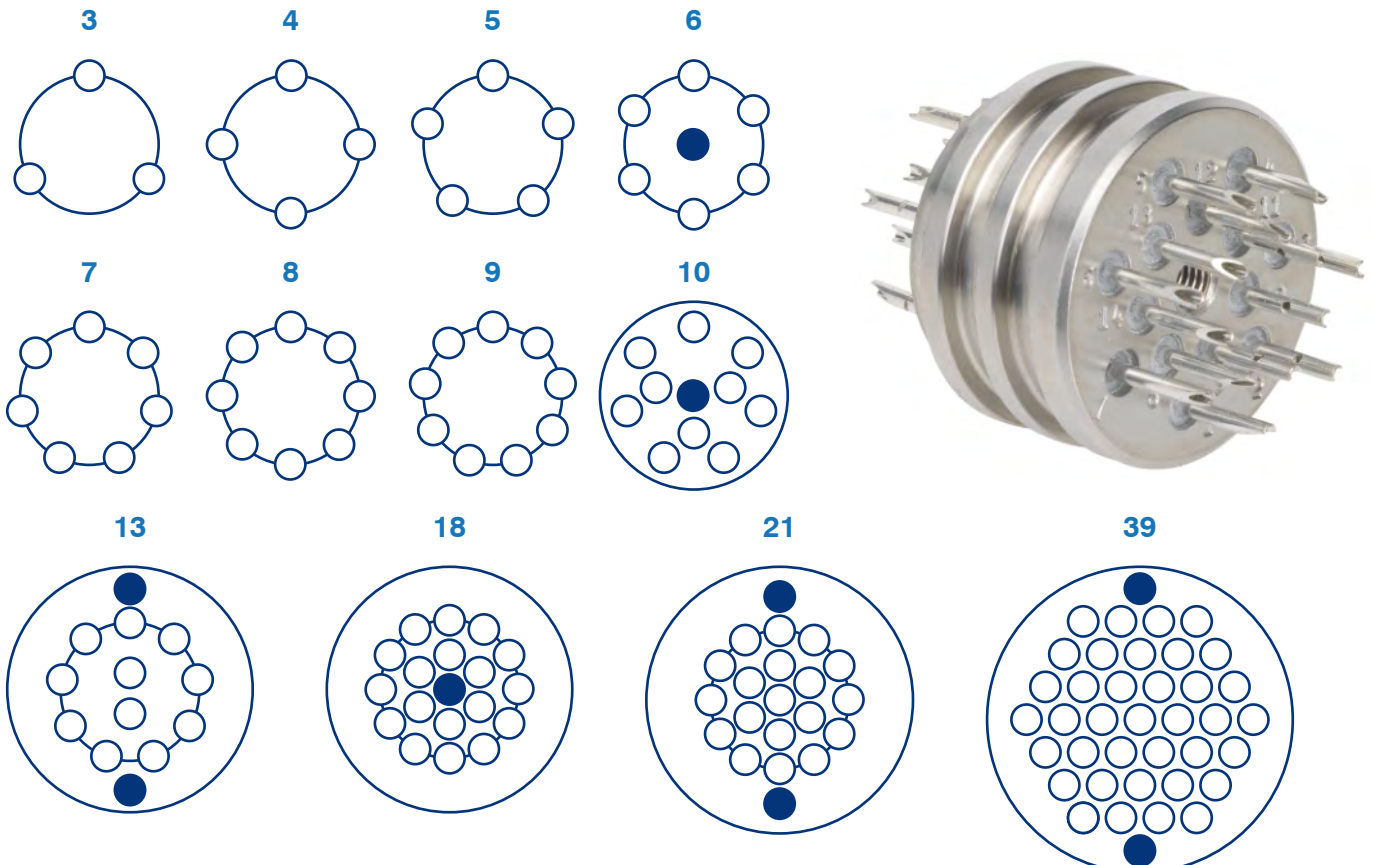
In many harsh environments high pressure is a major challenge. The ability to withstand such pressure is further complicated when elevated temperatures are also a factor. Martec high-pressure/high-temperature bulkhead feedthroughs are designed to provide optimal performance and reliability in these hostile conditions.

Features

- 25,000 PSI @ 400 F (204 C) pressure tight glass sealed connector
- Solder Cups for 24 AWG wire
- Threaded screw enables the removal of the product
- Weld mounted wires creates strong connection



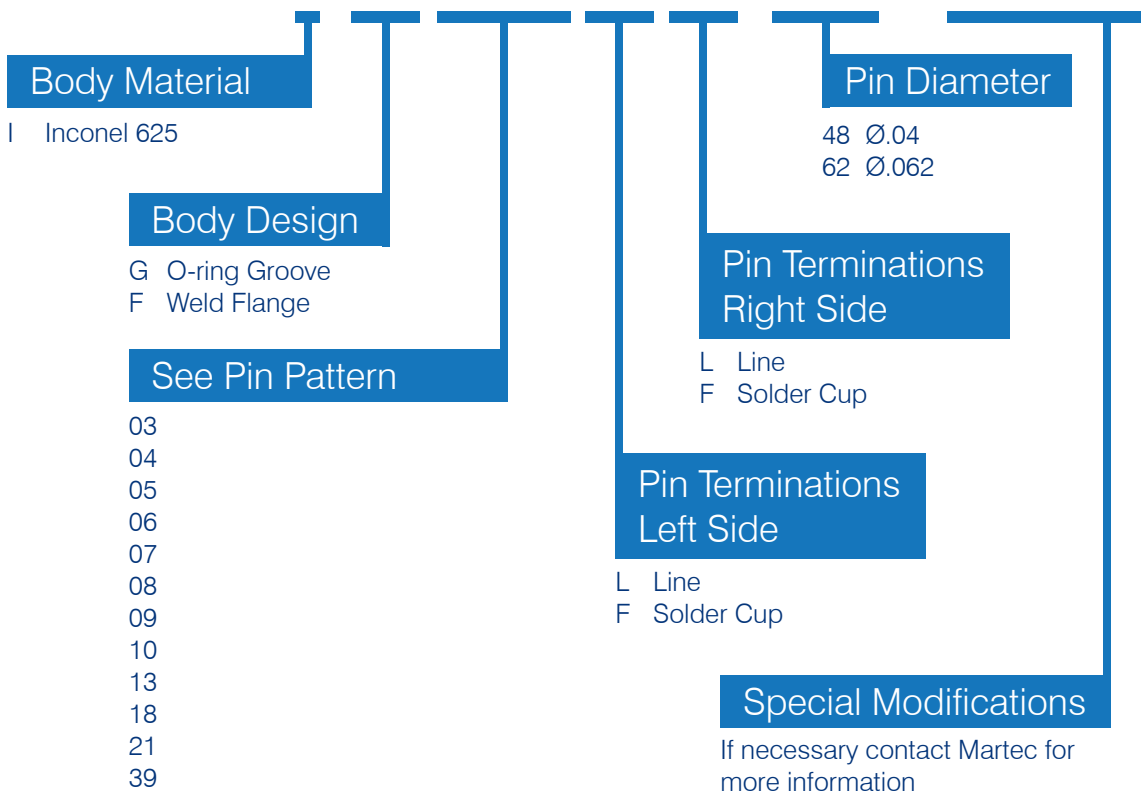
Pin Pattern





Part Number Builder

M-HTHP-I-X-XX-X-X-62-(XXX)

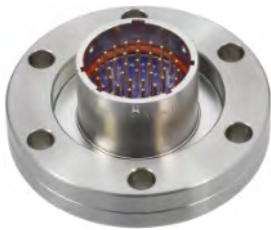


Deviations

Martec hermetics can be customised to optimise for a multitude of demanding functional requirements. Options range from feedthrough, penetrator and interconnect form factors to exotic material selection and custom mounting arrangements for system integration.

Vacuum Flanges

- Industry standard interface (e.g. 5015, 26482)
- Standard flange forms (e.g. CF : KF)
- Minimal trapped volumes
- Low out gassing, bakable materials



Shell Materials

- Stainless Steel
- Inconel(625/718)
- Titanium
- Hastaloymaterials



Pin Materials

- Alloy 48 / 52
- Kovar
- Stainless Steel
- Inconel



Filtering

- System integrity under harsh interference conditions
- Compact design providing space saving solutions
- Mateability with other standard Mil-Spec receptacles
- Point of entry (POE) signal conditioning



Socket

- Peak insert
- Industry standard interface (e.g. 38999,26482)



Standards

Martec offers a wide range of hermetic military specification (“mil-spec”) connectors for aerospace, defence and industrial applications

	Standard	Amphenol Series	Features
38999	MIL-DTL-38999 Series I	LJT	Scoop-proof bayonet mating sub miniature circular
	MIL-DTL-38999 Series II	JT	Bayonet mating sub miniature circular
	MIL-DTL-38999 Series III	TVS	Scoop-proof tri-start sub miniature circular
	JN	SJT	Scoop-proof bayonet mating sub miniature circular – Typhoon qualified
	Micro 38999	2M	Scoop-proof Tri-start micro miniature circular
26482	MIL-DTL-26482 Series I	PT/62GB	Bayonet lock miniature circular
	MIL-DTL-26482 Series II	PT/602GB	Bayonet lock miniature circular
	PAN	PT/602GB	Bayonet lock miniature circular
83723	MIL-DTL-83723 Series III Threaded	BTY/BFY	Miniature quick disconnect threaded circular
	EN2997 / ESC10	BTY (Y144)	Miniature quick disconnect threaded circular, high temp
26500	MIL-DTL-26500	ZZL/ZZB	Medium threaded or bayonet lock circular
5015	MIL-DTL-5015	172GB	Threaded circular
24308	MIL-DTL-24308	17GB	Cable Mount D-sub



Specifying Hermetic Interconnects

How many conductors?

Consider including a number of redundant conductors to accommodate any system developments you have planned for the future, or to comply with specified growth provisions.

What are the electrical requirements?

Work out a steady state and peak requirement for both the current and voltage.

Will your GTMS be under any pressure?

Depending on the medium (for example, oil, water or a vacuum) there may be a pressure differential to consider. GTMS can be supplied in multi-pin preforms or, for high pressure applications (up to 60,000 psi / 400 MPa), in individual glass beads.

How will your GTMS be attached?

Will it be secured with a standard O ring, for example, or welded in place? Or will you need a custom-designed mounting arrangement for optimum system integration?

What are your cable interface requirements?

Be sure to include any instructions for screen termination, potting requirements and/or cable strain relief.

Do you require custom functionality?

If you have any specific requirements, such as electromagnetic compatibility (EMC) filters or printed circuit board (PCB) mounting, make sure they are included in your design specification.

What are your plating requirements?

We offer a wide range of in-house plating options, including tin, nickel, hard and soft gold. We can also customise the plating to meet any special or unique requirements. Note that gold plated solder contacts should either be desoldered before installation, or appropriate plating thickness specified, to avoid solder embrittlement.

Are there any environmental factors?

If your application will be operating in a harsh or hostile environment (exposed to shock, vibration, thermal changes or extreme temperatures, for example) these will need to be factored into the design.

What are the qualification requirements?

If qualification tests are required, these should be discussed and specified during the design phase.

Martec is able to perform most qualification tests on the appropriate levels of assembly.

What testing will you need?

Examples include leak testing, pressure test, geometrical and electrical testing; including breakdown, voltage and insulation resistance of finished parts.



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