

OMNETICS

SPACE GRADE CONNECTORS

To make life easier for the design engineer, Omnetics Connector Corporation has released its own set of standard space grade Bi-Lobes®. These MIL-DTL-32139 Nano-miniature connectors are approved for space programs and inspected per EEE-INST-002.

These space grade Bi-Lobes® connectors at .025" pitch, are the smallest Space grade connectors on the market. Compared to larger Micro-D and D-Subminiature configurations Omnetics has reduced size and weight by as much as 4x that of standard Micro-D connectors and 8x that of previous D-Sub footprints. These connectors like all of Omnetics connectors use its patented flex-pin gold plated contacts that are polarized and shrouded by a unique liquid crystal polymer insulator making these connectors capable of over 2,000 mating cycles. Omnetics Space Qualified connectors are available in a number of tail terminations. Standard pre-wired connectors come in 18" and 26" lengths with 80 micro inches of silver plated 30 AWG (7-38) PTFE insulated wire. Board mount options include both surface mount as well as thru-hole. If you are using a rigid flex, flex tails are also available.



Pre-Wired/Cable
Pin counts: 9-85
80 Micro inches of Silver Plated - 30 AWG



Surface Mount
Pin counts: 9-85
Avail. Horiz & Vertical



Flex
Pin counts: 9-85 pos.



Thru-Hole
Pin counts: 9-85 pos.
Available: Straight, V4, H4



Panel Mount
Pin counts: 9-85 pos.

Omnetics space grade Bi-Lobes® are available in three shell finishes. The standard is a Nickel plated Aluminum; however, both Stainless Steel and Titanium are also available upon request. Omnetics chose these 3 materials as each shell finish is suitable for use in vacuum environments, whereas, materials like Cadmium are prohibited for space.

What about Outgassing?

As we have come to learn both plastic as well as rubber materials give off gaseous molecules. In fact, the physical environment to which these components are used within, play an even bigger role in terms of the immediate effect. Environments such as deep space feature both heat and vacuum elements all of which increase the rate to which these gasses diffuse. In a spacecraft, these gases can become a legitimate problem, as these gases coming off polymers can actually contaminate certain optical surfaces and instruments. The results can severely degrade the equipment's performance.

How is this measured?

The space world has adopted a standardized test procedure called ASTM E 595. The purpose of this test is to evaluate the outgassing properties of polymers. Within this test, small samples of materials are heated up to 125° C (257° F) at a vacuum of 5×10^{-5} torr for 24 hours. At that point the sample is then weighed to calculate the Total Mass Loss (TML). The TML cannot exceed 1.00% of the total initial mass. During this test, outgassed matter condenses on a cooled collector plate. This quantity of outgassed matter is calculated to determine the Collected Volatile Condensable Material (CVCM).

Component	Material	%TML	%CVCM	%WVR
Epoxy	Standard Epoxy	0.98	0.02	0.42
Epoxy	High Temperature Epoxy	0.24	0.02	0.08
Ink	White Epoxy Ink	0.64	0.01	0.42
Ink	Black Epoxy Ink	0.74	0.01	0.54
Insulator	LCP	0.03	0.00	0.01
Wire	30 AWG / 80 Micro in. Silver Plated	0.10	0.03	0.00

TML = Total Mass Loss | **CVCM** = Collected Volatile Condensable Materials | **WVR** = Water Vapor Regained



What is NASA screening?

The NASA specification EEE-INST-002 provides instruction on selecting, screening and qualifying parts for use on NASA GSFC space projects.

Does Omnetics offer NASA Screening?

Yes, Omnetics offers NASA screening per EEE-INST-002. Table 2J in particular in the NASA spec contains specific inspection instructions for Nano-miniature connectors.

NOTE: These additional screening requirements exceed those set previously by MIL-DTL-32139 in terms of inspection levels.

What Level of screening do I need?

NASA defines three levels of screening; **Level 1** for the highest level of reliability or for applications deemed "mission critical," **Level 2** is for high reliability, and **Level 3** is for standard reliability.

How do I order space grade Bi-Lobes® from Omnetics?

1) Select your housing type and material

- ✓ Nickel-plated aluminum, Titanium and Stainless steel housing are available and are all considered suitable for Space

2) Select your pin arrangement and insulator type

- ✓ Insulator types are available in both dual row per MIL-DTL-32139 or in a single row format. Pin counts range from 5 contacts to 85,

3) Select your preferred tail termination

- ✓ Standard parts are available pre-wired, surface mount, thru-hole and flex.
- ✓ Standard wire lengths are available 18" and 36" with 30 AWG (80 micro-inches of silver plating)

4) Select a NASA Screening level

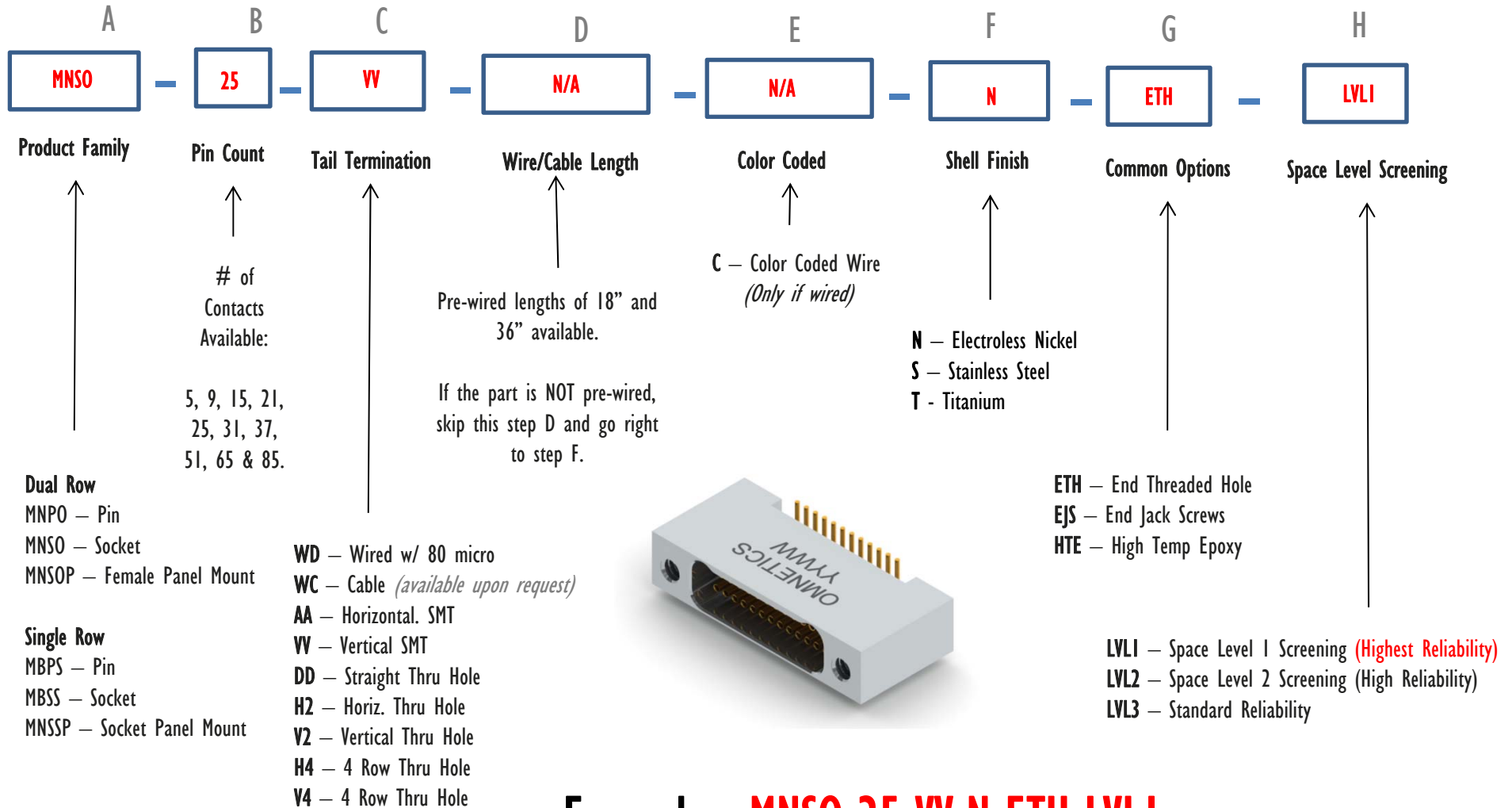
- ✓ Level 1 for **HIGHEST RELIABILITY**
- ✓ Level 2 for high reliability
- ✓ Level 3 for standard reliability (comes standard per MIL-DTL-32139)

Inspection/Test	Omnetics Level 1	Omnetics Level 2
Visual Inspection	100%	100%
Mechanical	13 pcs.	13 pcs.
Voltage (DWV)	100%	100%
Insulation Resistance	100%	100%
Temperature Cycling	2 pcs.	N/A
Mating Force	2 pcs.	N/A
Low Level Contact Resistance (LLCR)	2 pcs.	2 pcs.
Solderability/Resistance to Soldering Heat *	2 pcs.	N/A

* For Surface Mount and Thru-hole connectors ONLY and the test itself, is destructive.



UNDERSTANDING THE NOMENCLATURE



Example: **MNSO-25-VV-N-ETH-LVL1**

The nomenclature above alerts sales, that you would like a dual row female (MNSO) Omnetics Space Qualified BiLobe with 25 contacts. Tails are to be Surface Mount Vertical (VV), with an Electroless Nickel housing featuring end thru holes (ETH). Parts are to be screened per EEE-INST-002 LEVEL 1.