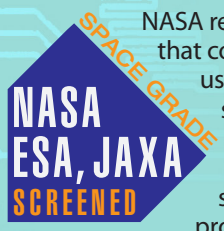
Application notes: NASA screening guidelines for space-grade applications

ASTM E595 AND NASA SCREENING



NASA recommends that connectors used for space flight applications be specially screened and processed to reduce Collected Volatile Condensable Material (CVCM) to acceptable levels. NASA EEE-INST-002 instructions for EEE parts selection, screening, qualification, and derating contains three levels of screening for space-grade components. These outgassing and screening modification codes are listed at right. To order any of the available levels of space-grade processing on an HD Stacker™ connector, simply append the modification code directly to the end of part numbers as shown in the following examples:

GSTB HD Stacker™ connector with NASA level 1 Screening and 48 Hour Oven Bake Outgassing at 175°C ***GSTB-120-.270-G1-429J***.

GSTB HD Stacker™ connector with NASA level 1 Screening and No Outgas Processing ***GSTB-120-.270-G1-429B***.

Specifying Appropriate NASA Screening

1 ***Choose a NASA EEE-INST-002 Table 2A screening level.*** This table contains three screening levels: ***Level 1*** for missions requiring the highest reliability and lowest level of risk, ***Level 2*** for low to moderate risk missions, and ***Level 3*** missions where enhanced screening and inspection is not invoked.

2 ***Choose outgassing process and/or NASA inspection requirements.*** Seven options are available for NASA outgassing, see Table I for details. Cross reference Table II for inspections completed by screening level as required by NASA standards.

3 ***Select the modification code*** from the Table I and add it to the HD Stacker™ part number. Example: ***GSTB-120-.270-G1-429J***.

Table I: Outgassing per NASA Screening Levels

Screening Level	No Outgas Processing	48 Hour Oven Bake +175° C 100%	Thermal Vacuum* Outgassing 24 Hour +125° C 100%	Mod Code
3			●	429L
2	●			429
			●	429A
		●		429K
1	●			429B
			●	429C
		●		429J

*Thermal vacuum of 10^{-6} Torr.

Table II: NASA EEE-INST-02, Table 2A Screening Levels

Inspection	Level 1	Level 2	Level 3
Visual	100%	100%	100%
Mechanical	2	2	
Dielectric Withstanding Voltage	2	2	
Insulation Resistance	2	2	
Contact Engagement & Separation Force	2		
Coupling Force	2		

Note: required inspection quantity shown. Zero acceptance of failures allowed for all quantities inspected. Inspection is not performed/required for MIL-DTL-38999, Class G

Outgassing Properties of HD Stacker Connectors

GSTBL, GSTB, GSTB (.095) Connectors and 980-008 Spacers

Component	Material	Brand Name	% Total Mass Loss (TML)	% Collected Volatile Condensable Material (CVCM)	Test Report
Thermoplastic Insulator	40% Glass-filled PPS	Fortron 1140L4	0.06	0.01	NASA Test #GSC24581
White Ink	Epoxy	Markem 7224 White	0.49	0.03	NASA Test #GSC19899

GSTT and GSTF Connectors

Component	Material	Brand Name	% Total Mass Loss (TML)	% Collected Volatile Condensable Material (CVCM)	Test Report
Thermoplastic Insulator	40% Glass-filled PPS	Fortron 1140L4	0.06	0.01	NASA Test #GSC24581
Potting Compound	Epoxy	Hysol C9-4215	0.48	0.01	Glenair Test
Wire	Tefzel®	Tefzel®	0.22	0.01	NASA Test #GSC19998
White Ink	Epoxy	Markem 7224 White	0.49	0.03	NASA Test #GSC19899

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