TENDER SPECIFICATIONS DOCUMENT
FR-4 RODS/2024001667

SPECIFICATION –

SL.NO.	DESCRIPTION	VALUE/TYPE
1.	Type	NEMA grade FR-4 material
2.	Material	Thermoset composite
3.	Chemical name	Epoxy glass laminate
4.	Additive	Glass
5.	Specific gravity	Any value from 1.80 to 1.85
6.	Flammability rating	UL 94V-0
7.	Tensile strength	Greater than and equal to 200 Mpa
8.	Compressive strength	Greater than and equal to 190 Mpa
9.	Hardness (M scale)	Greater than and equal to 100
10.	Thermal Conductivity	Lesser than and equal to 0.3 w/m-k
11.	Coefficient of linear thermal expansion	15×10^{-6} /degree celsius or lesser
12.	Total mass loss (TML)	Lesser than and equal to 1.0 %
13.	Collected volatile condensable material (CVCM)	Lesser than and equal to 0.1 %
14.	Working temperature range	-40 degree Celsius to 100 degree Celsius
15.	Applicable MIL standard	MIL – I – 24768/27
16.	Glass transition temperature	Greater than and equal to 120 degree Celsius
17.	Sizes of rods	I. DIA. 0.25" X 48" II. DIA. 0.5"X48" III. DIA. 0.625"X48" IV. DIA. 1.0"X48" V. DIA. 2.0"X48"

OTHER FEATURES/REQUIREMENTS –

1. Can be machined to meet custom requirement.
2. Tolerance on the diameter of rods (all sizes) should be ± 0.008 Inch or better.
3. Applicable MIL standard (MIL – I – 24768/27) must be complied.

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General terms and conditions (applicable for all)

1. **Supply conditions-**
   a) Different size rods should be packed separately in proper wooden crates to avoid any damages during handling and transportation.
   b) Details like size, material, quantity and lot/batch number should be clearly displayed on each packing.
   c) Batch number/lot number should be clearly mentioned for rods.
   d) Delivery should be within three months of purchase order placement.
   e) Damaged/deformed rods are not acceptable.
   f) All tests related to composition and properties (chemical, mechanical, thermal, electrical and outgassing properties) must be done from NABL accredited lab as per ASTM standards.
   g) The manufacturer shall furnish CoC (Certificate of Conformance), Mill TC, inspection and testing from NABL accredited laboratory with test reports of FR-4 rods, complying with specifications mentioned under section 'SPECIFICATION'.

2. **Evaluation criteria –**
   a) Bidding can be done on total evaluation basis.
   b) Order can be placed to L1 supplier on total evaluation basis.

3. **Inspection and dispatch-**
   a) Supplier's name, material, size, batch/lot number shall be stenciled on each piece of FR-4 material (Rods).
   b) Tensile test specimens shall be prepared from each batch of rods. Minimum three nos. of samples shall be tested for material acceptance. All samples shall meet the requirements as per specification table.
   c) Material shall be dispatched only after approval/clearance of CoC/test result certificates (submitted by party) by QA/SAC. Pre-dispatch inspection/testing of samples shall be tested by QA/SAC at the supplier/vendor premises, which shall be solely decided by SAC if material being supplied by Indian agent/trader. Party shall maintain proper traceability of all data related to the manufacturing of FR-4 material (Rod).

4. **Documents from the vendor-**
   (A) Documents required at the time of bid-
   a) Duly filled compliance sheet.
   Compliance sheet needs to be dully filled in column no-4 and column no-5 respectively. Offered value against the indented specification/type should be mentioned clearly in the column no-4 and accordingly the column no-5 to be filled. Make/Brand as offered by vendor/supplier/bidder should be clearly mentioned in the last row of item table in the compliance sheet. Bids with incompletely filled compliance sheet are liable for rejection. **Demo filled compliance sheet** is attached as a reference for duly filling compliance sheet.
   b) Brand/Make certificate.
   c) Material safety data sheet.
   d) Product data sheet.
   (B) Documents required at the time of supply-
   a) All test certificates as per ASTM standards.
   b) Brand/Make certificate.