

TENDER SPECIFICATION DOCUMENT
FR-4 RODS - 2023002415

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 110
10.	Thermal Conductivity	Less than and equal to 0.3 w/m-k
11.	Coefficient of linear thermal expansion	15 X 10 ⁽⁻⁶⁾ /degree celsius or lesser (Ambient to 100 degree celsius)
12.	Total mass loss (TML)	Less than and equal to 1.0 %
13.	Collected volatile condensable material (CVCM)	Less than and equal to 0.1 %
14.	Working temperature range	-200 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

OTHER FEATURES/REQUIREMENTS –

1. Can be machined to meet custom requirement.
2. Tolerance on the diameter of rods (all sizes) should be ± 0.004 Inch or better.

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General terms and conditions (applicable for all)

1. Supply conditions-

- a) Different size rods should be packed separately in proper packing.
- b) Details like size, material and quantity 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.

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. 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.
- 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.