Forced Air Cooled Compartment.

For most ceramic / metal power transmitting tubes, the maximum operating temperature is as follows:

Ceramic / Metal Seals 250 ºC
Anode Core 250 ºC

Forced air cooling is used, and it is sufficient to limit the maximum tube temperature to 225 ºC.

Below I have gathered some data about different materials which maybe could be used in a forced air cooled compartment, like the one I designed and used in my Dentron MLA-2500B amp.

However, you will soon see that only one material may be used, and that is **Teflon® PTFE**, due to the temperature spec.

I consider the G-10 / G-11 not usable for this application, as charring of the material will occur after extended periods above the temperature rating. I expect that a compartment should have a indefinite lifetime, and not only a few years of operation.

Teflon® was discovered in 1938 by Dr. Roy J. Plunkett of the DuPont Company. Teflon® is a fluorocarbon-based polymer. PolyTetraFluoroEthylene is commonly abbreviated **PTFE**, and the Teflon® brand of PTFE is manufactured only by DuPont.

Teflon® PTFE
PTFE has high chemical resistance, low and high temperature capability, resistance to most chemicals, low friction, and excellent electrical and thermal insulation. PTFE lacks mechanical strength in some configurations, so it is typically used for non-loaded parts, and seals, gaskets and fittings.
PTFE's mechanical properties can be increased by adding fillers, such as glass fibers, carbon, graphite, molybdenum disulphide, and bronze. Generally, filled PTFE's maintain their excellent chemical and high temperature characteristics, while fillers improve mechanical strength, stability, and wear resistance.

GLASS LAMINATES

G-3 (Glass Cloth / Phenolic Resin)
G3 is made from woven glass cloth and high-temperature phenolic resin. It has excellent flexural, compressive and impact strengths.

G-5 and G-9 (Glass Cloth / Melamine Resin)
These materials are very hard and flame resistant, and have excellent electrical properties. G-5 and G-9 have high arc and heat resistance. G-9 is recommended for humid environments. They are used for switch board panels, arc barriers, circuit breaker parts, and structural electrical parts.

G-7 (Glass Cloth / Silicon Resin)
This glass-silicon laminate has good electrical properties under humid conditions, excellent heat and arc resistance, and is self-extinguishing. G-7 is used for electrical insulation, and for heating & appliance insulation.

G-10 and G-11 (Glass Cloth / Epoxy Resin)
These glass-epoxy laminates has an extremely high strength and high dimensional stability over temperature. G-10 and G-11 are used for terminal boards, high humidity applications, electrical and electronic test equipment. These laminates are difficult to cut or machine, and may require special equipment. G-10 is slightly stronger while G-11 is a better insulator and can take higher temperatures.

Delrin® is a crystalline thermoplastic polymer with a high melting point.
It has a high elasticity combined with great strength and stiffness. It is suitable for mechanical parts or electrical insulators that require structural strength above normal temperatures.

Typical thermal properties of glass laminates, Delrin® and Teflon® PTFE.

Property	G-3	G-5 / G-9	G-7	G-10	G-11	Delrin®	PTFE
Melting Temp (ºF / ºC)	*	*	*	*	*	347 / 175	635 / 335
Max Op. Temp (ºF / ºC)	340 / 170	285 / 140	430 / 220	284 / 140	329 / 165	180 / 82	500 / 260

***** No melting will occur; however charring will occur after extended periods above the temperature rating.