
















TUBING, MgO SHEATH, PROTECTION TUBE, AND DRILLED WELL MATERIALS

CERAMICS AND COMPOSITE MATERIALS		TYPICAL AREAS OF USE				APPLICATION GUIDELINE INFORMATION
MATERIAL / COMPOSITION	TUBING	MgO SHEATHS	PROTECT. TUBES	DRILLED WELLS		
Alumina  (Recrystallized 99.7% AL ₂ O ₃)					Up to 1899° C (3400°F) when supported. Has only fair resistance to thermal and mechanical shock. Essentially same areas as Mullite including induction melting and vacuum furnaces. Impervious to gases at high temperatures.	
Carbide  II (Cast oxide composites)					Up to 1093° C (2000°F) for submerged use in aluminum and other non-ferrous metals. Not wetted by molten aluminum and other non-ferrous metals. No contamination. Good thermal and mechanical shock resistance.	
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Hexalloy  SA sintered alpha, silicon carbide					Up to 1650° C (3400°F) in air. High thermal conductivity, excellent wear and abrasion resistance, high thermal shock resistance and good mechanical strength. Superior chemical resistance in both reducing and oxidizing environments. Attacked by Haldes, fused caustics and ferrous metals.	
Metal Ceramic LT-1 (slip cast composite of chromium and aluminum oxide) 77% chromium 2% aluminum oxide					Up to 1374° C (2500°F) in oxidizing conditions. Main areas of usage are molten copper base alloys to 1149° C (2100°F), blast furnace and stack gases to 1316° C (2400°F), Sulzer burners to 1093° C (2000°F), cement kilns to 1024° C (2200°F), chemical process reactors to 1371° C (2500°F). A ceramic primary tube is required when a noble metal thermocouple is used.	
Mullite 63% alumina					Up to 1510° C (2750°F) when supported. Has poor mechanical shock resistance, good thermal shock resistance. For barium chloride salt baths to 1288° C (2350°F) Should be vertical mounted or supported if horizontal. For high temperature applications of ceramic industry, heat treating and glass manufacturing. Impervious to gases at high temperature.	
Refractory Coated (Series 1100)					Up to 745° C (1400°F). Refractory laminated coating resists erosion from molten aluminum, zinc or galvanizing bath. Slip cast protective bulb at tip for fast response and thermal expansion. resistance to 1260° C (2300° F)	
Silicon Carbide 99% silicon carbide, 9% silicone 9% silicon dioxide balance aluminum oxide					Up to 1650° C (3000°F). For an outer protection tube with Alumina  mullite primary tube. For brick and ceramic kilns, steel soaking pits and molten non-ferrous metals. Can withstand direct flame impingement. Fair thermal shock resistance. Approximately 14% porosity.	
Silicon Nitride					Up to 927° C (1700° F). For use in aluminum and other non-ferrous metal foundries. Not wetted by molten aluminum and other non-ferrous metals. No contamination. Resists thermal and mechanical shock.	
Vesuvius					Up to 927° C (1700° F). For use in aluminum and other non-ferrous metal foundries. Not wetted by molten aluminum and other non-ferrous metals. No contamination. Resists thermal and mechanical shock. Handle carefully.	