

Rhenium MOCVD Heater Filaments

For nearly 20 years Rhenium Alloys has been the leader in production of the highest quality rhenium heater filaments for the MOCVD Industry. Rhenium Alloys has been the OEM for many of the world's most reputable and respected MOCVD equipment manufacturers, along with being the specialty filament supplier for the most revolutionary and technology leading LED companies in the world.

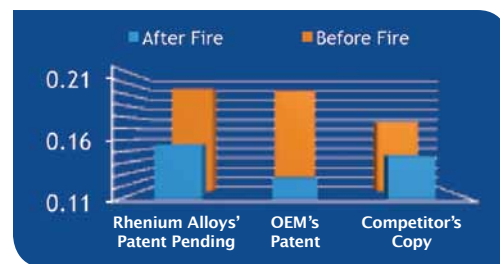
Rhenium Alloys produces Rhenium Heater Filaments for today's most reputable systems, and continues to manufacture rhenium filaments for legacy systems including the D125, D180 and D300 units. OEM and customer specific versions are also being produced daily. Rhenium Alloys can produce rhenium filaments to any customer's design specifications or thicknesses.

Rhenium Alloys also offers a proprietary, patent pending, surface treatment which increases the heat transfer efficiency of the filament without adding the risk of contamination from steel shot-peening and other aggressive mechanical operations utilized by our competitors. This allows Rhenium Alloys to offer the highest purity Rhenium Heater Filament on the market.

Rhenium Alloys offers discounts on new rhenium filaments with the trade-in of obsolete or old rhenium filaments.

Rhenium Alloys can also repair minimally damaged filaments on a case by case basis. Although most repairs return the filaments back to original functionality, Rhenium Alloys does not warranty any repaired filaments.

Surface Treatment Thermal Emittance



Rhenium Alloys' Re Element with Patent Pending Treatment

Highest Initial Emittance

Highest Final Emittance

Ultra-High Purity Rhenium

Larger, More Stable Microstructure

Patent Pending — Zero Contamination Risk Surface Treatment



Standard Re Heater Filaments by System Type



Rhenium

Typical Properties	
Atomic Weight	186.2
Density	21.04 g/cm ³
Thermal Properties	
Melting Point	3186 °C
Boiling Point	5627 °C
Coefficient of Linear Thermal Expansion	6.8 µm/m·K from 20 to 1000 °C
Specific Heat	25.7 kJ/kg·K 25 °C
Thermal Conductivity	71.2 W/m·K at 20 °C
Mechanical Properties	
Ultimate Tensile Strength	1130 MPa at 20 °C, 81.70 MPa at 2149 °C
Yield Strength at 0.2% Offset	379 MPa at 20 °C, 77.2 MPa at 2149 °C
Elongation	24% at 20 °C, 10% at 2149 °C
Hardness	225 VHN as annealed
Strain-Hardening Exponent	0.52
Shear Modulus	170 GPa at 20 °C
Elastic Modulus	460 GPa at 20 °C, 10.3 GPa at 2149 °C
Poissons Ratio	0.49
Creep Strength (2200 °C)	10-h rupture stress, 20 MPa; 100-h rupture stress, 10 Mpa

Fabrication Characteristics and Chemical Properties

Welding: Electron Beam welding and Laser joining methods produce extremely ductile joints.

General Resistance to Corrosion: Oxidation in air is catastrophic above 600 °C due to the formation of rhenium heptoxide (Re₂O₇), which has a melting point of 363 °C. Rhenium is resistant to carburization; it withstands arc corrosion well and has good wear resistance.

Resistance to Specific Agents: Rhenium is resistant to water cycle corrosion; to sulfuric acid and hydrochloric acid (but can be dissolved by nitric acid); to liquid alkali metal corrosion; and to attack by molten zinc, silver, copper, and aluminum.