

## High Performance Metal Solutions

# H.C. Starck Solutions' High Temperature Furnace Products

H.C. Starck Solution offers nearly 100 years of experience with a trusted supply chain of superior refractory pure and alloyed materials for heat treating medical, aerospace, defense and automotive products.

### Materials

- > Molybdenum
- > Tungsten
- > Tantalum
- > Niobium
- > TZM
- > MHC
- > MoLa (molybdenum-lanthanum)
- > MoW (molybdenum-tungsten)

### Applications

- > Annealing
- > Brazing
- > Heat Treating
- > HIPing
- > Melting
- > Pre-heating for Metalworking
- > Powder Processing
- > Sintering
- > Tempering
- > MIM (Sintering/Debonding)

### Forms Available

- > Furnace Assemblies
- > Boats & Trays
- > Furnace Racks
- > Flat Ribbed Heating Elements
- > Hot Zones
- > Heat Shields
- > Rolled and Bent Formed Product
- > Brackets and Furnace Fixture

### Furnaces Served

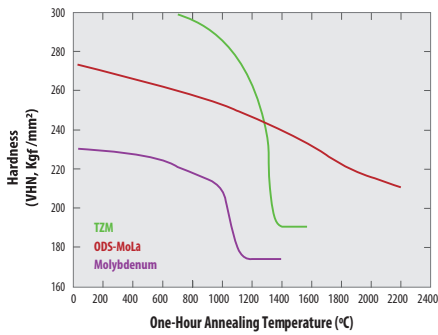
- > High temperature furnaces in vacuum, reducing or inert atmospheres
- > Chemical reaction furnaces in vacuum, air, or various atmospheres



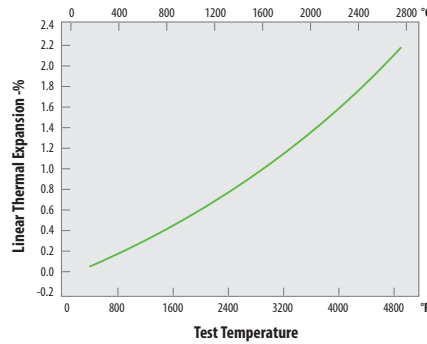
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# Superior Mechanical Properties with Molybdenum Alloys

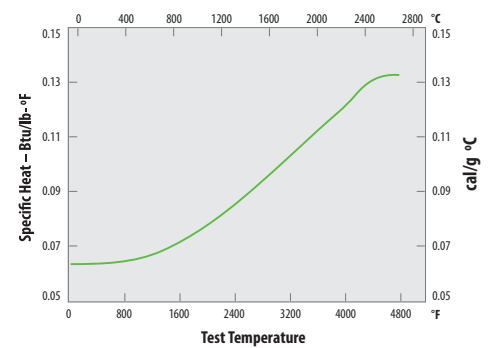
**HARDNESS VERSUS ANNEAL TEMPERATURE**



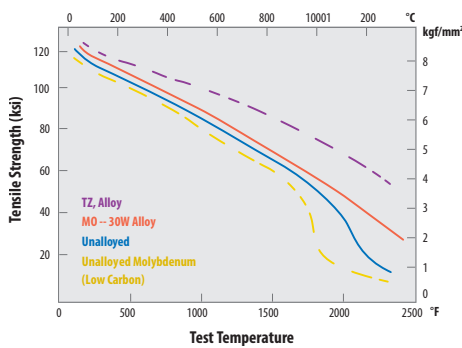
**THERMAL EXPANSION VERSUS TEMPERATURE**



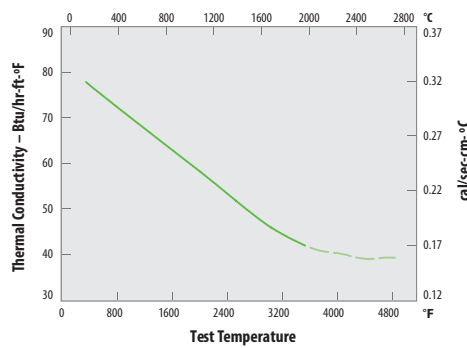
**SPECIFIC HEAT VERSUS TEMPERATURE**



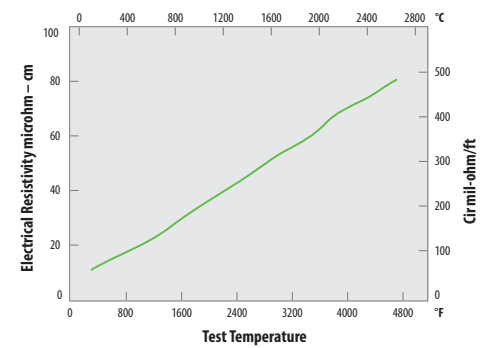
**TENSILE STRENGTH VERSUS TEMPERATURE**



**THERMAL CONDUCTIVITY VERSUS TEMPERATURE**



**ELECTRICAL RESISTIVITY VERSUS TEMPERATURE**



Typical Tensile Properties for indicated Products (5/8 inch Diameter bars)

High melting temperature refractory, lower cost than Tungsten, creep resistance, and high temperature mechanical properties.

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