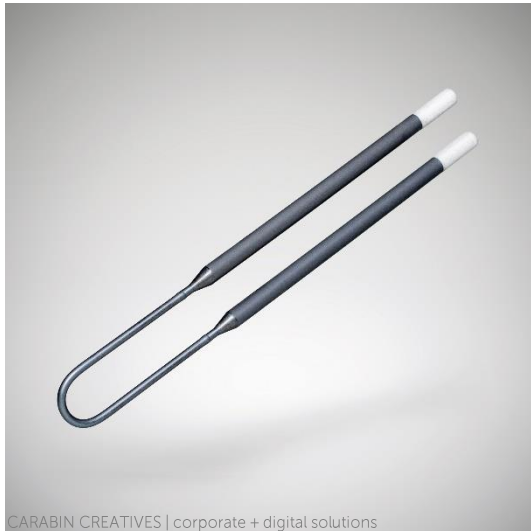


MolyCom[®] HOT ALONE WON'T DO THE TRICK

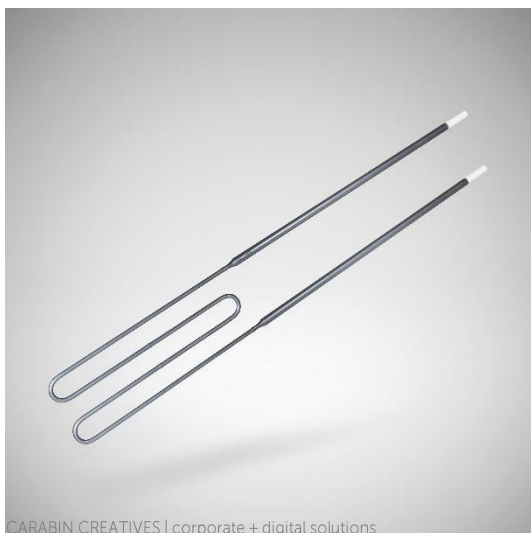
Molybdenum disilicide (MoSi_2) electric heating elements
up to **1820 °C (3308 °F)** element temperature



MolyCom[®]-Ultra and **MolyCom[®]-Hyper** electric heating elements are metallic-ceramic materials mainly composed of molybdenum disilicide (MoSi_2). Above **1000 °C** service temperature the surface will form a protective high-temperature layer of pure quartz, which gives the **MolyCom[®]** heating elements a high resistance to oxidation.

The elements may be used up to a surface temperature of maximum **1820 °C** in oxidizing atmospheres. These elements are manufactured according to established industry standards. Long service life and easy replacement contribute to high furnace utilization and low maintenance costs. The surface of the element will form a self-regenerating protective layer in oxidizing atmosphere. That makes them suitable for aggressive atmospheres. For even specific process atmospheres we provide heating elements with a thicker SiO_2 layer.

New and old elements can be used together and in series. The elements can also be used in combination with other molybdenum disilicide elements as an alternative or replacement part, because the element's wearout affects the performance only slightly.



Whether industrial standard, high-purity demands or special resistance to oxidation – **SCHUPP[®] Ceramics** makes high temperature technology to suit your specific requirements.

MolyCom[®]-Ultra 1700, 1800 and 1850 are particularly durable and conform to industrial standards.

MolyCom[®]-Hyper heating elements are composed of high-purity raw materials. Trace elements are reduced to a minimum (1/10 compared to competitor) which makes them suitable for high purity sophisticated demands. Therefore the heating elements show an excellent low temperature oxidation ("pest") resistance and long life use. **MolyCom[®]-Hyper 1800** and **MolyCom[®]-Hyper 1800SC** (Super Clean) allow sintering of zirconia without discolouration, also above **1600 °C**. **MolyCom[®]-Hyper 1800AP** (Anti Pest) is a special type of element, one that is resistant to oxidation from **200 °C** to **700 °C**.

YOUR BENEFITS WITH MOLYCOM[®] AT A GLANCE

- ✓ MolyCom[®]-Ultra – Industrial Standard
- ✓ MolyCom[®]-Hyper – HIGH-PURITY
- ✓ Up to **1820 °C** element temperature, up to **1750 °C** application temperature
- ✓ High surface load and long service life
- ✓ U-, L-, W-shaped elements and other geometries
- ✓ Diameters from 3/6 mm to 12/24 mm and lengths from 25 mm to 2000 mm

MATERIAL PROPERTIES OF MOLYCOM®-ULTRA 1700 / -ULTRA 1800 / -ULTRA 1850

| | MolyCom®-Ultra 1700 | MolyCom®-Ultra 1800 | MolyCom®-Ultra 1850 |
|---|-----------------------------|-----------------------------|-----------------------------|
| Density | 5.8 kg/dm ³ | 5.8 kg/dm ³ | ≥ 6.5 kg/dm ³ |
| Bending strength at 20 °C (68 °F) | 350 – 450 N/mm ² | 350 – 450 N/mm ² | 350 – 450 N/mm ² |
| Porosity | < 1 % | < 1 % | < 1 % |
| Max. element temperature (under air) | 1700 °C (3092 °F) | 1780 °C (3236 °F) | 1820 °C (3308 °F) |
| Max. furnace/kiln temperature (under air) | 1550 °C (2822 °F) | 1650 °C (3002 °F) | 1750 °C (3128 °F) |

MATERIAL PROPERTIES OF MOLYCOM®-HYPER 1800 / -HYPER 1800SC / -HYPER 1800AP

| | MolyCom®-Hyper 1800 | MolyCom®-Hyper 1800SC ¹⁾ | MolyCom®-Hyper 1800AP ²⁾ |
|--|-----------------------------|-------------------------------------|-------------------------------------|
| Density | 5.7 kg/dm ³ | 5.7 kg/dm ³ | 5.7 kg/dm ³ |
| Bending strength at 20 °C (68 °F) | 350 – 450 N/mm ² | 350 – 450 N/mm ² | 350 – 450 N/mm ² |
| Porosity | < 1 % | < 1 % | < 1 % |
| Max. element temperature (under air) | 1800 °C (3272 °F) | 1800 °C (3272 °F) | 1800 °C (3272 °F) |
| Max. furnace/kiln temperature (under air)* | 1750 °C (3182 °F) | 1750 °C (3182 °F) | 1750 °C (3182 °F) |

* Depending on furnace size and type. | ¹⁾SC - Super Clean / ²⁾AP- Anti Pest

IMPURITIES OF MOLYCOM®-HYPER 1800

| [ppm] | Al | Fe | Mg | Ca | Ti | Na | K | Cr | Ni | Mn | Cu |
|----------------|------|------|------|------|------|------|------|----|----|------|------|
| Competitor | 3500 | 1200 | 740 | 560 | 114 | 104 | 95 | 53 | 43 | 13 | < 10 |
| MolyCom®-Hyper | < 10 | 590 | < 10 | < 10 | < 10 | < 10 | < 10 | 20 | 11 | < 10 | < 10 |

MAXIMUM RECOMMENDED ELEMENT TEMPERATURES IN VARIOUS ATMOSPHERES

| | MolyCom®-Ultra 1700 | MolyCom®-Ultra 1800 | MolyCom®-Ultra 1850 |
|---------------------------------|---------------------|---------------------|---------------------|
| Air | 1700 °C (3092 °F) | 1780 °C (3236 °F) | 1820 °C (3308 °F) |
| Nitrogen (N ₂) | 1600 °C (2912 °F) | 1700 °C (3092 °F) | 1750 °C (3182 °F) |
| Argon (Ar); Helium (He) | 1600 °C (2912 °F) | 1700 °C (3092 °F) | 1750 °C (3182 °F) |
| Hydrogen (H ₂), dry | 1150 °C (2102 °F) | 1150 °C (2102 °F) | 1150 °C (2102 °F) |

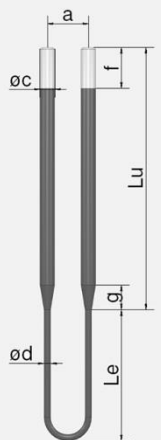
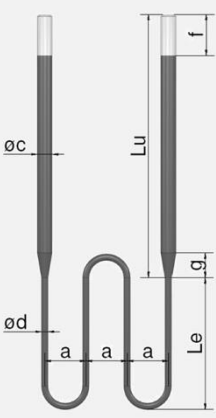
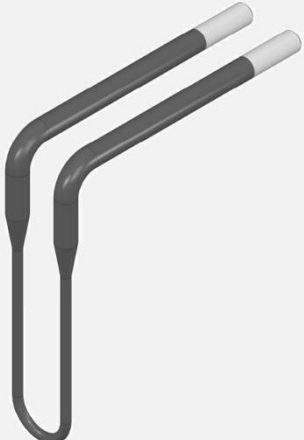

AVAILABLE SIZES OF MOLYCOM®-ULTRA AND MOLYCOM®-HYPER

| Size of element [mm] | Ø d | Ø c | Lu | Le | a | f | g |
|----------------------|-----|-----|------------|-----------|----|-----|----|
| 3/6* | 3 | 6 | 60 – 400 | 25 – 500 | 25 | 25 | 15 |
| 4/9* | 4 | 9 | 60 – 400 | 25 – 500 | 25 | 25 | 15 |
| 6/12* | 6 | 12 | 70 – 1000 | 40 – 1400 | 50 | 45 | 25 |
| 9/18 | 9 | 18 | 70 – 1000 | 50 – 2000 | 60 | 75 | 30 |
| 12/24 | 12 | 24 | 100 – 1000 | 60 – 2000 | 80 | 100 | 40 |


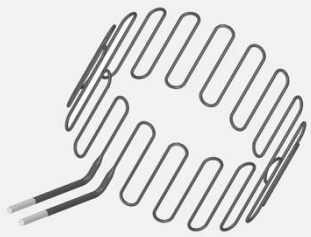
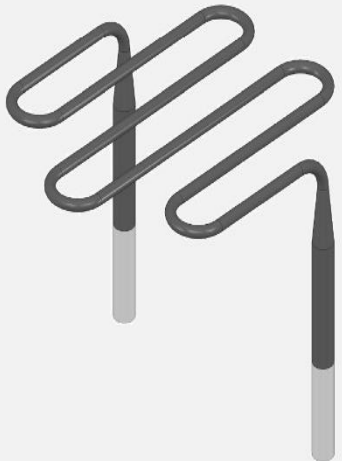
MolyCom®-Ultra and -Hyper heating elements are manufactured by the Powder-Metallurgy-Technology. They are made in U-, W- and L-shapes, diameters 3/6 mm, 4/9 mm, 6/12 mm, 9/18 mm, 12/24 mm and in total length up to about 2000 mm and more. MolyCom® products are precisely manufactured and hot bended.

* Also available as MolyCom®-Hyper 1800, MolyCom®-Hyper 1800SC and MolyCom®-Hyper 1800AP with a maximum length of Le with 650 mm and Lu with 500 mm.

AVAILABLE STANDARD TYPES OF HEATING ELEMENTS

| U-Shape | W-Shape and Multi-Shank | L-Shape (bent 90° at Lu) | L-Shape (bent 90° at Le) |
|---|---|--|---|
|  |  |  |  |

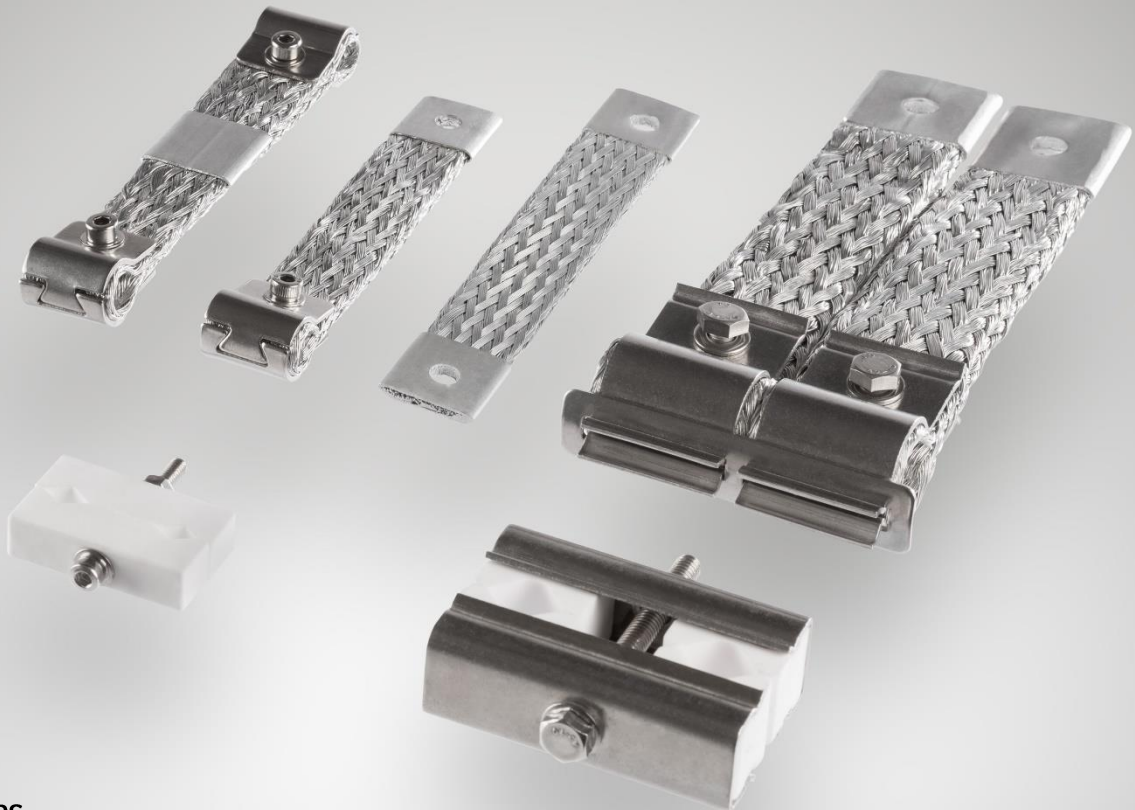
AVAILABLE SPECIAL TYPES OF HEATING ELEMENTS

| Rod-Type | Panorama-Shape | Meander-Shape |
|---|---|---|
|  |  |  |
| <p>Other types upon request.</p> | | |

AVAILABLE ACCESSORIES FOR MOLYCOM® HEATING ELEMENTS

CONTACT STRAPS

- ✓ Power-to-Power
- ✓ Power-to-Element
- ✓ Element-to-Element



HOLDERS

- ✓ Single-shank holders
- ✓ Two-shank holders

All necessary accessories like contact straps, single- and two-shank holders, air nozzles and passage bricks are available.

Martin Braun Fotografie – www.braun-foto.com