

TZM

Technical Datasheet

Short-Name	TZM (Titan-Zirkon-Molybdän)	Chemical Composition (Reference values in %)	Ti	Zr	C	Mo
Code	-		0.5	0.08	0.03	balance
Material-No.(old)	-					

Material-Properties High melting point, higher high-temperature strength in comparison with pure Molybdenum, low thermal extension, good thermal conductivity and chemical resistance.

Applications

- Trays in continuous heating furnaces
- Sinter boats
- Hot-runner tips in plastic injection nozzles
- Vacuum furnace heating elements
- Electrodes for RP welding of copper sheets

Mechanical Properties (Reference values)	Hardness	HV	200–250
	Tensile strength c. 85 % reduced	N/mm ²	800–1.000
	Yield strength	N/mm ²	750–900
	Elongation L = 5 D	%	6–10
	Modulus of elasticity 20 °C (293 K)	kN/mm ²	300

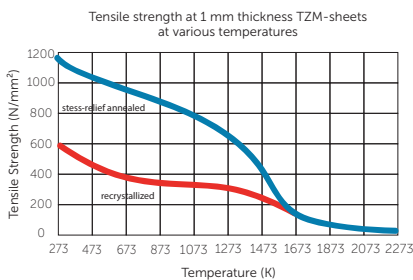
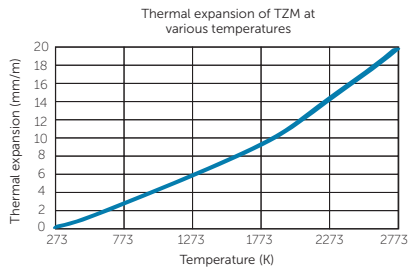
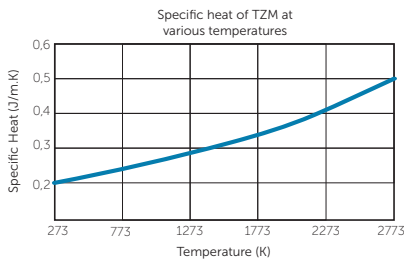
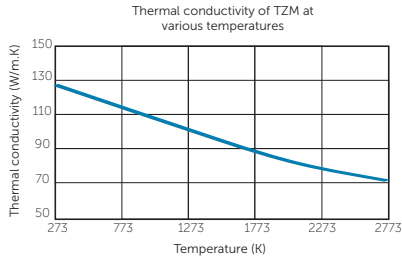
Physical Properties	Electrical conductivity 20 °C (293 K)	MS/m	ca. 15
	Electrical resistance 20 °C (293 K)	$\frac{\Omega \cdot \text{mm}^2}{\text{m}}$	ca. 0.06
	Coefficient of electrical resistance	$\frac{1}{\text{K}}$	ca. 0.0046
	Coefficient of thermal expansion 0-300°C (273-573 K)	$\frac{1}{\text{K}}$	5.3 – 5.7•10 ⁻⁶
	Specific heat	$\frac{\text{J}}{\text{g} \cdot \text{K}}$	0.25
	Thermal conductivity 20 °C (293 K)	$\frac{\text{W}}{\text{m} \cdot \text{K}}$	ca. 130
	Density	g/cm ³	10.2

Products

Wire, bars, sheets, machined parts against drawing.
Tensile strength properties depend on cross-section and design.

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Machining Instructions (Reference values)

Turning	Tungsten Carbide ISO K 05	HSS 1.3202
Cutting speed (m/min)	70–120	30–40
Rake angle	ca. 20°	ca. 20°
Feed and depth of cut	–	–
Clearance angle	7–10°	7–10°

Milling	Tungsten Carbide ISO K 10 / ISO K 05	HSS 1.3202
Cutting speed (m/min)	80–120	20–25
Rake angle	10°	10°
Feed (mm/min)	–	–

Drilling	Tungsten Carbide ISO K 10 or ISO K 05	HSS 1.3202
Cutting speed (m/min)	12	10–15

Wire-cut EDM and die sinking	Possible, electrodes and machining datas according to the machine producers experience.
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All statements as to the properties or utilization of the materials and products mentioned in this datasheet are only for the purpose of description. Guarantees in respect of the existence of certain properties or utilization at the material mentioned are only valid if agreed upon in writing.