



Material for EM-Tec high precision carbon steel cutting tweezers

The EM-Tec high precision cutting tweezers are made from DIN 1.1221 hardened carbon steel and includes the following tweezers:

50-005015	EM-Tec 15.CS high precision cutting tweezers, 12mm angled blades
50-005020	EM-Tec 15P.CS high precision cutting tweezers, 12mm parallel blades
50-005025	EM-Tec 15M.CS high precision cutting tweezers, 10mm angled blades

General remarks:

- Carbon steel DIN 1.1221 (Ck 60, AISI 1060)
- Contains 0.57-0.65 wt% carbon
- Magnetisable
- Hardened by heat treatment with maximum hardness of 57 HRC
- Poor corrosion resistance
- Ideal for cutting soft metal wires (copper, gold, silver, aluminium, steel)
- Typical applications include tweezers and cutting tools for fine mechanics, watch making, jewellery and electronic industry

General composition of Carbon steel 1.1221

Element	Wt. %
C	0.57 – 0.65
Mn	0.60 – 0.90
Cr	≤0.4
Ni	≤0.4
Mo	≤0.1
Si	0.15 – 0.35
P	≤0.035
S	≤0.035
Fe	Balance



Properties of Carbon Steel 1.1221

Mechanical Properties	
State	Hardened
Density	7.9 g/cm ³
Hardness, HRC	55-57
Tensile strength, ultimate	850 - 1000 MPa
Tensile strength, yield 0.2%	550 MPa
Elongation at break	12%
Modulus of Elasticity	200 GPa
Poisson's ration	0.29
Thermal Properties	
Coefficient of linear thermal expansion	11 x 10 ⁻⁶ /°C (20-100°C)
Coefficient of linear thermal expansion	12 x 10 ⁻⁶ /°C (20-300°C)
Specific heat capacity	0.502 J/(g.K)
Thermal conductivity	52W/(m.K)
Continuous use (service) temperature	450°C
Maximum service temperature (short)	500°C
Electrical Properties	
Resistivity	0.8 x 10 ⁻⁴ Ohm.cm

TSB 50-005015 Material for EM-Tec high precision carbon steel cutting tweezers 2022-05-04 Revision 3