

Material for Value-Tec stainless steel probes

The material used for manufacturing the Value-Tec stainless steel probe handles and probe needles is a martensitic hardened stainless steel AISI 410

It is used for the following products:

- [#52-001070 Value-Tec VP1 probe with straight tip](#)
- [#52-001071 Value-Tec VP2 probe with bend tip](#)
- [#52-001072 Value-Tec VP3 probe with slight curved tip](#)
- [#52-001073 Value-Tec VP4 probe with bend hook tip](#)
- [#52-001074 Value-Tec VP5 probe with curved hook tip](#)
- [#52-001075 Value-Tec VP6 probe with sharp curved hook tip](#)

General remarks:

- AISI 410 is a martensitic steel (DIN 1.4006, X12Cr13) which can be hardened by heat treatment
- Contains 11.5 – 13.5 wt% Chromium
- Magnetic, hardened stainless steel
- Can be hardened by heat treatment
- Properties can be varied by different heat treatments
- Good corrosion resistance to most solvents, moderate corrosion resistance to salts and weak acids
- Generally used where moderate corrosion resistance combined with high mechanical strength is required
- Typical applications include probes, spatulas, knives, tools and springs

General composition of AISI 410

Element	Wt. %
C	≤0.15
Cr	11.5 – 13.5
Mn	≤1.0
Si	0.0
P	≤0.04
S	≤0.03
Fe	Balance

Properties of AISI 410

Mechanical Properties	
State	Hardened, stress relieved
Density	7.74.0 g/cm ³
Hardness Rockwell B	80
Hardness Vickers	291
Tensile strength, ultimate	485 MPa
Tensile strength, yield	310 MPa
Yield stress, 0.2%	275 Mpa
Elongation until break	25%
Modulus of Elasticity	200 GPa
Poisson's ratio	0.29
Thermal Properties	
Coefficient of thermal expansion	9.9 x 10 ⁻⁶ /°C (20-100°C)
Coefficient of linear expansion	11 x 10 ⁻⁶ /°C (20-300°C)
Specific heat capacity	0.46 J/(g.K)
Thermal conductivity	24.9W/(m.K)
Continuous use (service) temperature	705°C
Maximum service temperature (short)	815°C
Electrical Properties	
Resistivity	0.57 x 10 ⁻⁴ Ohm.cm

TSB 52-001070 Material for Value-Tec stainless steel probes 2015-10-24 Revision 1