

Temperature Controls Pty Ltd



1424

ISO9001:2000
Lic 14412

Metallic Thermocouple Protection Sheath and Thermowell Materials

SHEATH MATERIAL	MAXIMUM TEMPERATURE (CONTINUOUS SERVICE IN AIR)	NOTES
304 Stainless Steel <ul style="list-style-type: none"> • 18% Chromium • 8% Nickel 	900°C	Good corrosion resistance. Subject to damaging carbide precipitation in 480°C to 870°C range.
304L Low Carbon Stainless Steel	900°C	Low carbon version of 304 S/S. Low carbon content allows this material to be welded and heated in the 480°C to 870°C range without damage to corrosion resistance.
310 Stainless Steel <ul style="list-style-type: none"> • 25% Chromium • 20% Nickel 	1150°C	Mechanical and corrosion resistance similar to but better than 304 S/S. Very good heat resistance. Not as ductile as 304 S/S.
316 Stainless Steel <ul style="list-style-type: none"> • 18% Chromium • 12% Nickel • 2 – 3% Molybdenum 	900°C	Best corrosion resistance of the austenitic stainless steel grades. Good corrosion resistance in Hydrogen Sulphide. Subject to damaging carbide precipitation in the 480°C to 870°C range.
316L Low Carbon Stainless Steel	900°C	Same as 316 S/S except low carbon version allows for better welding and fabrication.
347 Steel	800°C	Similar to 304 except nickel columbium stabilised. Designed to overcome susceptibility to carbide precipitation in the 480°C to 870°C range.

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321 Stainless Steel	870°C	Similar to 304 but carbide stabilised. Carbide stabilised grade intended to prevent harmful precipitation of chromium carbides and the resulting susceptibility to intergranular corrosion. For corrosion conditions and intermittent heating and cooling applications between 425°C and 815°C
446 Stainless Steel <ul style="list-style-type: none"> • 26% Chromium • No Nickel 	1150°C	Ferritic stainless steel which has good resistance to sulphurous atmospheres at high temperatures. Good corrosion resistance to nitric acid, sulphuric acid and most alkalis. 27% chromium content gives this alloy the highest heat resistance of any ferritic stainless steel.
Inconel 600 <ul style="list-style-type: none"> • 76% Nickel • 15.5% Chromium 	1175°C	Good high temperature strength, corrosion resistance, resistance to chloride-ion stress corrosion cracking and oxidation resistance to high temperatures. Do not use in sulphur bearing environments. Good in nitriding environments.
Inconel 601 <ul style="list-style-type: none"> • 60.5% Nickel • 23% Chromium • 1.5% Aluminium 	1175°C Intermittent 1260°C	Similar to Inconel 600 with outstanding resistance to oxidation and good resistance to carburizing and sulphur containing atmospheres.
Inconel 625	980°C	Excellent high temperature strength. Excellent resistance to pitting and crevice corrosion. Unaffected by radiation embrittlement.

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<p>Incoloy 800</p> <ul style="list-style-type: none"> • 32.5% Nickel • 46% Iron • 21% Chromium 	<p>1095°C</p>	<p>Good elevated temperature resistance to oxidation and carburisation. Good sulphur and corrosion resistance.</p>
<p>Titanium</p>	<p>425°C</p>	<p>Lightweight, excellent strength in the 150°C to 425°C temperature range. Excellent resistance to oxidising acids such as nitric or chromic. Resistant to inorganic chloride solutions, chlorinated organic compounds and most chlorine gas. Resistant to salt water spray and sea water.</p>
<p>Monel 400</p> <ul style="list-style-type: none"> • 66% Nickel • 31% Copper 	<p>540°C</p>	<p>540°C maximum in oxidising conditions. Nickel-copper alloy with good corrosion resistance. Excellent resistance to sea water, hydrochloric acid and most alkalis.</p>
<p>Hastelloy B</p> <ul style="list-style-type: none"> • 61% Nickel • 28% Molybdenum 	<p>540°C (oxidising) 815°C (reducing or vacuum)</p>	<p>Excellent resistance to hydrochloric acid at all concentrations and temperatures. Also resistant to Hydrogen Chloride, Sulphuric Acetic and Phosphoric Acid.</p>
<p>Hastelloy C</p> <ul style="list-style-type: none"> • 54% Nickel • 15.5% Chromium • 4% Tungsten 	<p>1095°C</p>	<p>Excellent corrosion resistance, especially in chlorinated environments. Resistant to ferric and cupric chlorides, solvents, chlorine, formic acids, acetic acids, brine wet chlorine gas and hypochlorite.</p>
<p>Hastelloy X</p> <ul style="list-style-type: none"> • 47% Nickel • 9% Molybdenum • 22% Chromium • 0.5% Tungsten 	<p>1200°C</p>	<p>Good high temperature strength and resistance to oxidation to 1200°C. Also good for reducing conditions.</p>

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Tantalum	482°C (Air)	Refractory metal. Very ductile. Use only in inert or very good vacuums. Do not use in environments containing nitrogen above 371°C.
Alloy 20	982°C	Generic version of Carpenter 20CB-3 developed specially for resistance to Sulphuric Acid.
253MA <ul style="list-style-type: none">• 21 % Chromium• 11% Nickel	1150°C	Good resistance to combustion gases with structural stability at high temperatures.

Note: The material recommendations for various service conditions listed are intended to be used only as a guide.

No guarantee of material suitability can be made as other factors which affect the materials life may be present.