

THERMOWELL MATERIALS FOR TEMPERATURE SENSORS

Recommended operating temperatures; melting points and environmental operation characteristics.

Metal/Alloy	Maximum Operating Temperature °C	Melting Point °C	Sheath Environmental Operating Characteristics			Notes
			Oxidising	Reducing	Sulphurous	
Copper	150	1083	Fair	Good	Poor	Of all the common metals, it has the fastest response to change in temperature.
Brass	Composition Dependent	Composition Dependent	Poor	Fair	Poor	Suited to general purpose applications particularly light duty steam environments.
Aluminium	371	660	Fair	Fair	Fair	Lightweight and with good resistance to corrosion.
Monel*	538	1325	Good	Good	Fair	High strength and corrosion resistant. Suited to sulphuric acid and caustic solutions.
Mild Steel	550	1525	Poor	Poor	Poor	General purpose sheath with limited corrosion resistance.
Cupro Nickel 70/30	760	1230	Good	Fair	Fair	Good resistance to corrosive environments particularly under wet conditions.
Cast Iron	870	1535	Poor	Fair	Poor	Resistant to concentrated sulphuric and caustic solutions.
Stainless Steel AISI 304	900	1430	Good	Fair	Fair	Fair corrosion resistance over whole operating temperature range.
Stainless Steel AISI 316	900	1430	Good	Fair	Fair	Good corrosion resistance throughout operating temperature range.
Stainless Steel AISI 310	1100	1400	Good	Fair	Fair	Good resistance to oxidation but manipulation is then limited. Limited high temperature strength.

*Trade names

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			Oxidising	Reducing	Sulphurous	
Stainless Steel AISI 446	1150	1400	Very Good	Good	Good	High resistance to oxidation and sulphurous attack. Limited high temperature strength.
Inconel 600*	1100	1400	Good	Fair	Poor	Has good resistance to oxidation and carburisation. Has good hot strength.
Incoloy 800*	1100	1370	Good	Fair	Good	Superior to Inconel for resistance to oxidation and attack by sulphurous compounds.
Hastelloy X*	1222	1300	Very Good	Fair	Very Good	Very resistant to attack by oxidation and sulphurous compounds
Nicrobell B*	1250	1420	Very Good	Very Good	Poor	Good high temperature strength recommended for vacuum atmosphere. Best when used with type 'N' thermocouples.
Nicrobell C*	1250	1420	Very Good	Very Good	Fair	A high chromium alloy excelling in carburising environments.
Nickel	1260	1455	Good	Good	Poor	Resistant to attack by many chemicals.
Platinum	1677	1773	Very Good	Poor	Fair	Extremely resistant to attack by oxidising atmospheres.
Niobium	1982	2497	Poor	Poor	Poor	Very high resistance to attack by many acids. Inert to many molten metals.
Molybdenum	2200	2620	Poor	Fair	Fair	Has very high corrosion resistance to metals.
Tantalum	2480	2996	Poor	Poor	Poor	Extremely ductile and corrosion resistant.

*Trade names