

Alleima® TD

Tube and pipe, seamless

Datasheet

Alleima® TD is a nickel-chromium alloy characterized by:

- Excellent resistance to high temperature corrosion, particularly in oxidizing conditions
- Good strength at high temperatures

This alloy is suitable for a wide range of applications where resistance to both heat and corrosion are requirements.

Chemical composition (nominal)

Chemical composition (nominal) %

C	Si	Mo	Mn	P	S	Fe	Cr	Ni
<0.02	1.4	3	<0.05	<0.01	<0.005	<1.0	22	Balance

Others: REM

Applications

Alleima® TD is designed and developed for Mineral Insulating Cable applications (MIC). Its high temperature corrosion resistance makes this Nickel-Chromium alloy suitable for temperatures up to 1250 °C for thermocouple protection tubes.

Forms of supply

Alleima® TD seamless nickel alloy tubing is supplied bright annealed in the outside diameter 26.67 mm (1.050 in. OD; 0.824 in. ID) and wall-thickness 2.87 mm (0.113 in.), ¼ SCH 40.

Tolerances

Size OD, mm	Tolerances OD, mm	Wall Thickness %
26.67	0.3	+/- 10

Please contact Alleima for more information regarding other dimensions and finishes.

Mechanical properties

At 20°C (68°F)

Metric units

Proof strength		Tensile Strength		Elongation	Hardness HRB
$R_{p0.2}^a$		R_m		$A_{2''}$	
MPa	ksi	MPa	ksi	%	Approx.
>310	>45	>600	>87	>40	85-90

1 MPa = 1 N/mm²

1) $R_{p0.2}$ corresponds to 0.2% offset yield strength.

Physical properties

Density, at 20°C; 68°F; 8.33 g/cm³, 0.30 lb/in³

Thermal conductivity

Metric units, x10⁻⁶/°C

Temperature, °C	W/(m °C)	Temperature, °F	Btu/(ft h °F)
23	11,0	73	6,5
100	12,5	200	7,0
200	14,5	400	8,5
300	16,0	600	9,5
400	18,0	800	10,5
500	19,5	1000	12,0
600	25,0	1200	15,0
700	27,5	1400	16,0
800	28,5	1600	16,5
900	29,5	1800	18,5
1000	32,5	2000	20,0
1100	34,5		
1200	38,0		

Specific heat capacity

Temperature, °C	J/(kg °C)	Temperature, °F	Btu/(lb °F)
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23	445	73	0,105
100	465	200	0,110
200	485	400	0,115
300	505	600	0,120
400	520	800	0,125
500	535	1000	0,130
600	630	1200	0,150
700	635	1400	0,155
800	655	1600	0,160
900	680	1800	0,170
1000	720	2000	0,175
1100	740		
1200	785		

Thermal expansion

Metric units, $\times 10^{-6}/^{\circ}\text{C}$

Temperature, $^{\circ}\text{C}$	Per $^{\circ}\text{C}$	Temperature, $^{\circ}\text{F}$	Per $^{\circ}\text{F}$
30-100	12.5	86-200	7.0
30-200	13.5	86-400	7.5
30-300	14.0	86-600	7.5
30-400	14.0	86-800	8.0
30-500	14.0	86-1000	8.0
30-600	15.0	86-1200	8.5
30-700	15.5	86-1400	9.0
30-800	16.0	86-1600	9.0
30-900	16.5	86-1800	9.5
30-1000	17.0	86-2000	9.5
30-1100	17.5	-	-
30-1200	18.0	-	-

Resistivity

Temperature, °C	μΩm	Temperature, °F	ΩCirc.mil/feet.
20	1.19	68	715
100	1.25	200	750
200	1.26	400	761
300	1.28	600	770
400	1.30	800	784
500	1.32	1000	794
600	1.29	1200	776
700	1.27	1400	766
800	1.27	1600	765
900	1.23	1800	743
1000	1.22	2000	732
1100	1.20		

Modulus of elasticity, x10³, annealed condition

Temperature, °C	MPa	Temperature, °F	ksi
20	184	75	26.7
100	182	200	26.4
200	176	400	25.6
300	171	600	24.7
400	166	800	23.9
500	159	1000	22.7
600	151	1200	21.5
700	144	1400	20.4
800	138	1600	19.3
900	130	1800	17.5
1000	117	2000	15.1
1100	103	2200	14.1
1200	97		

Disclaimer:

Recommendations are for guidance only, and the suitability of a material for a specific application can be confirmed only when we know the actual service conditions. Continuous development may necessitate changes in technical data without notice. This datasheet is only valid for Alleima materials.