

## **MINERAL INSULATED (MI) ALLOY 825 S.S. HEAT TRACE CABLE ASSEMBLY**



### **DESCRIPTION**

Delta-Therm seamless Alloy 825 sheath was developed to meet the demands of corrosive environments that are severe and/or unusual. Delta-Therm uses only seamless Alloy 825 tube to avoid the potential problems associated with seam-welded tube used by most heat tracing manufacturers.

Independent laboratory reports have shown Alloy 825 to be superior to most other alloys including Inconel 600. After many years experience with other materials, we have standardized on Alloy 825 as the sheath material on our high temperature heating cable.



## RESISTANCE TO REDUCING ENVIRONMENTS, STRESS CORROSION AND OXIDIZING ENVIRONMENTS

The relatively high nickel content of alloy 825, plus molybdenum and copper, makes it considerably more resistant to reducing environments (such as sulfuric or phosphoric acids) than most of the common stainless steels. It also effects a high resistance to stress corrosion cracking in chloride or alkaline environments. The chromium content, in combination with the nickel, makes the alloy resistant to a variety of oxidizing environments such as nitric acid solutions, nitrates and oxidizing salts.

## APPEARANCE

Metallic, 32 micro inch rms finish, or smoother with dull gray finish.

## CARBIDE PRECIPITATION

Austenitic stainless steels such as type 304, and also many high nickel alloys such as alloy 600, are subject to carbide precipitation at grain boundaries when operated in, or cooled slowly through, the range of -800°F (-427°C) to 1599°F (871°C), rendering the metal susceptible to intergranular attack.

The presence of titanium, plus the low carbon content of alloy 825, makes it relatively immune to this phenomenon at these temperatures. Alloy 825 can be used at temperatures up to 1472°F (800°C) in normal atmospheres.

## Limiting Chemical Composition, % By Weight:

Nickel	38 - 46
Carbon	0.05 Max.
Manganese	1.0 Max.
Iron	Balance
Sulfur	0.03 Max.
Silicon	0.5 Max.
Copper	1.5 - 3.0
Chromium	19.5 - 23.5
Aluminum	0.2 Max.
Titanium	06 - 1.2
Molybdenum	2.5 - 3.5

## Equivalent Analysis

Material No.	2.4858
DIN/SEW	17744
ASTM/ASME	B423-425
UNS. No.	N 08825
BS	3072-3076
BS No.	NA16

# QUICK REFERENCE GUIDE\*

Alloy	Description	Nominal Chemical Composition, % (Major Element)		Thermal Conductivity Btu-In/ Ft. 2-hr-°F(W/m-C)		High Temperature Resistance +1000°F (+540°C)		Corrosion Resistance															
		Nickel (+Cobalt)	Iron	Chromium	Other	70°F (21°C)	1500°F (816°C)	Oxidation	Carburization	Sulfuric Acid	Hydrochloric Acid	Hydrofluoric	Phosphoric Acid	Nitric Acid	Organic Acid	Alkalis	Salts	Seawater	Chloride Cracking	G-E = Good To Excellent NR = Not Recommended		A = Acceptable X = Check For Specific Data	
INCONEL Alloy 600 Nickel Chromium	High nickel, high chromium content for resistance to oxidizing and reducing environments; for severely corrosive environments at elevated temperatures.	76	8	15.5		103 (15)	193 (28)	G-E	G-E	A	NR	A	A	A	G-E	G-E	G-E	A	G-E				
INCOLOY Alloy 825 Nickel - Iron-Chromium	Excellent resistance to wide variety of corrosives. Resists pitting and intergranular type corrosion, reducing acids and oxidizing chemicals.	42	30	21.5	Mo 3.0 Cu 2.2	77 (11)	164 (23)	G-E	G-E	G-E	G-E	G-E	G-E	G-E	G-E	G-E	G-E	G-E	G-E				

\* From Huntington Alloys Publication 78-348-2