



## ANALYSIS OF SHEATH MATERIALS

### 1.) STAINLESS STEEL TYPE 304

Cr - 18-20%  
Ni - 8-12%  
Mn - 2% Max.  
Si - 1% Max.  
C - .08% Max.

### 2.) STAINLESS STEEL TYPE 321

Cr - 17-19%  
Ni - 8-11%  
Ti - 5% x C Min.  
C - .08% Max.  
Mn - 2% Max.  
Si - 1% Max.

### 3.) STAINLESS STEEL TYPE 316L

Cr - 16-18%  
Ni - 10-14%  
Mo 2-3%  
C - .03% Max.  
Mn - 2% Max.  
Si - 1% Max.

### 4.) INCOLOY 800

Ni + Co - 30-34%  
Cr - 19-22%  
C - .10%  
Mn - 1.5%  
S - .03%  
Si - 1%  
Fe - Remainder

### 5.) INCOLOY 840

Ni - 18-22%  
Cr - 18-22%  
Mn - 1%  
Cu - .075% Max.  
Si - 1.0% Max.  
C - .08% Max.  
S - .015%  
Fe - Remainder

### 6.) COPPER-ALLOY #122

Cu. 99.9% Min.  
P - .015-.040%  
Ag. - Counted as Cu

## MANUFACTURING LIMITS

### WATTAGE TOLERANCE

In the manufacture of electric tubular heaters, wattage variation will result. This variation on most standard heaters is up to plus five percent (5%) and down to minus ten percent (-10%) of the listed wattage. Closer tolerances can be held but this requires special care and added cost.

### DIMENSIONAL TOLERANCES

Always specify the largest acceptable tolerance permissible on element drawings. If tolerances are more rigid than necessary, it may require special tooling to maintain these tolerances which in turn raises costs. Be sure to specify all critical dimensions which will effect elements in their application.

### RESISTANCE LIMITS

There are limits in wire size that can be used in the manufacture of tubular elements. Listed below are the minimum and maximum cold ohms per inch of heated length verses diameter. If in doubt as to whether the heater can be made you may use the following formula to check design.

$$\frac{\text{Hot Ohms minus 4\%}}{\text{FINISHED HEATED LENGTH}} = \text{COLD OHMS PER INCH (APPROXIMATE)}$$

RESISTANCE LIMIT CHART		
DIAMETER	COLD OHMS PER INCH OF HEATED LENGTH	
	MINIMUM	MAXIMUM
.260	.105	12.50
.315	.080	16.50
.430	.040	16.50

Consult Durex Industries for heater designs which do not fall within these limits for further information.