



Heating Element

Single core with true cold ends: TET and TUT types

Minimum bending radius: 3 x OD

These types are recommended when the specific power (W/m) is very high and the cold ends have to be long.

The materials and characteristics are identical to those of the ZEZ or ZUZ types except for the electrical resistance of the core at the cold ends: the rate of the resistances per metre between hot part and cold ends are:

- about 80 for TET types,
- about 160 for TUT types.

This ratio diminishes when the cold ends are driven to a temperature of 300°C.

- Outer diameter range available from 0.5 up to 6 mm and length up to 150 m
- Compatible UHV, O₂, pressure up to 2000 bars (?)
- Minimum bending radius:
Stainless steel sheath: twice the outer diameter,
Inconel® sheath: 3 times the outer diameter

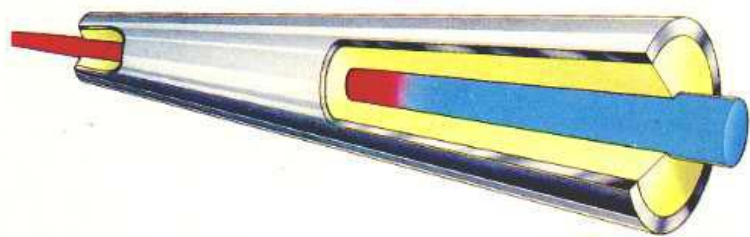
Materials

Core: nickel-chromium 80/20 elongated at each end by a conducting wire made of zirconium copper plated in stainless steel

Insulant: highly compacted mineral powder.

Sheath: continuous over the complete length, stainless steel (Ac) or Inconel® 600 alloy (I), without any joints, flush contour around the hot/cold transitions..

Continuous sheath without joint or flush contour around the hot/cold transitions.



Standard types

Sheath material	O.D. in mm	Minimum heating length in cm	TET		TUT	
			Line resistance in ohms/m at 20°C*			
			Hot part	Cold part	Hot part	Cold part
Stainless steel (Ac) or Inconel® (I)	1.5	100	5.5	0.07	12.4	0.07
	2.0	100	3.1	0.04	7.0	0.04
	2.5	100	2.0	0.03	4.5	0.03
	3.0	100	1.4	0.02	3.1	0.02

Maximum voltage

The voltage is determined by calculation. However, it must be limited at 110V for diameters 1 and 1.5 mm and to 220/380 V for larger diameters.

When temperature exceeds 600°C, it is advisable to use an isolating transformer.



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Swaging

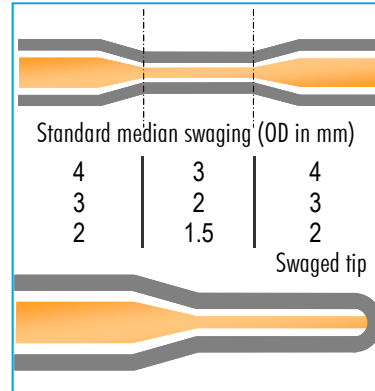
To increase the dissipated power without excessively heating up the connectors, a solution with swaging could be the answer.

Median swaging allows the power to be doubled. Numerous combinations of diameters are possible

Swaged tip allows multiplication of the power by a factor of 4. In this case, the end of the cable is normally grounded. The ratio between the diameters is 1 to 2.

This solution can be used when the power supply does not exceed 48 VDC or 24 VAC.

The purpose of the swaged tip is to double or to quadruple the power of the element.



Connection to supply cable

The THERMOCOAX heating elements are designed to work in very diverse and severe conditions.

Our connection range covers this diversity and the specific requirements of any applications.

The most common used connectors are issued from the plastic range where the maximum working temperature is 200°C and the metal/ceramic range where temperature can reach 600°C and operate in vacuum down to 10⁻⁹ bars.

More details are given in data sheet **E185**.



Seal glands and bushings

Any form of brazing or welding of a heating element through a wall requires some skill, and to facilitate the mounting, a range of small seal-glands have been developed and adopted for the standard THERMOCOAX dimensions.

More details are given in data sheet **E186**.



THERMOLOK seal gland



Bushing

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More information in the brochure
« How to choose your heating element »