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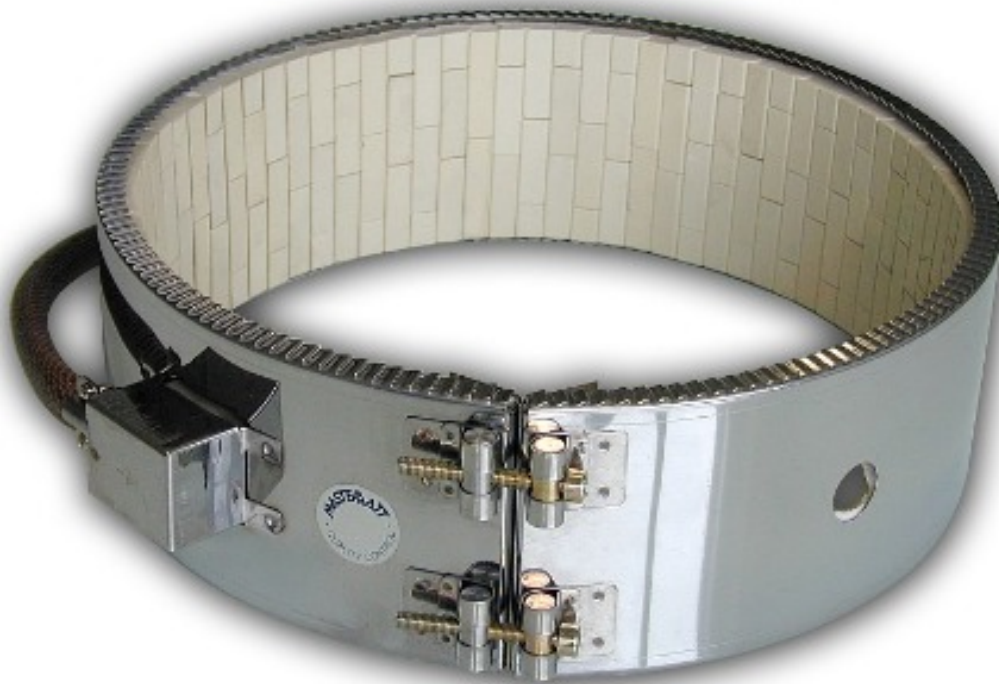
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Технические характеристики на ленточные керамические нагреватели KERAPLAST КОМПАНИИ MASTERWATT

Band heaters KERAPLAST



KERAPLAST ceramic heater bands for plastification cylinders

KERAPLAST

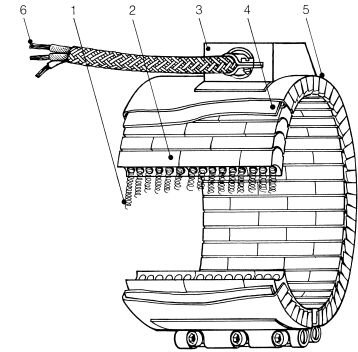
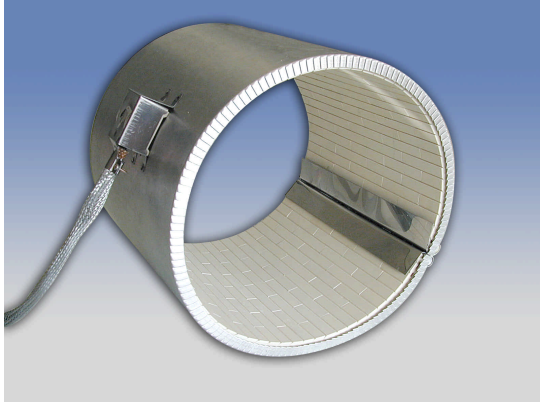
heaters are heater bands with ceramic insulation that are employed in the heating of the plastification cylinders of the plastic moulding machines. They are recommended when the operational temperature exceeds 280°C and in all cases presenting severe operational conditions. Thanks to the most advanced technical solutions, to the selection of the most appropriate materials and to the severe quality control procedures, they are characterised by:

- Long Operational Life
- Energy saving
- Fast heat conduction
- Uniform heat distribution
- High electrical insulation
- Easy installation
- Great mechanical resistance to shocks and to tearing applied to the cables
- Tight manufacturing tolerances

KERAPLAST

- High Power Heater Bands for Plastification Cylinders -

Figure 1



GENERAL CHARACTERISTICS

The continuous technological development in the moulding of plastic materials demands to all the machine components high performances and reliability. The long experience in this field and a specific technical solution allowed us to produce a family of heaters which fulfils these tight requirements. They have imposed throughout the market and have made us leaders in this field.

KERAPLAST heaters belong to the new generation of electrical heaters for the plastic industry and have become components of primary importance for the smooth operation of the moulding machine. The selection of the best materials, allows to reach very high heating power values and presents several advantages. In particular it is worth to mention:

- Long Operational Life
- Energy saving
- Fast heat conduction
- Uniform heat distribution
- High electrical insulation
- Easy installation
- Great mechanical resistance to shocks and to tearing applied to the cables
- Tight manufacturing tolerances

The heaters undergo dimensional and electrical controls all along the production phase, as requested by the company Quality Control System that is certified in accordance with ISO 9001:2000 Standard. A 100 % electrical acceptance test allows to verify the compliance of each single heater to the requirements specified in the applicable CEI/EN/UL Specification. In particular, the following tests are performed:

- Verification of the earth connector efficiency
- Measurement of the Insulation resistance
- Measurement of the dielectrical rigidity
- Measurement of the dispersion current
- Measurement of the resistance ohmic value

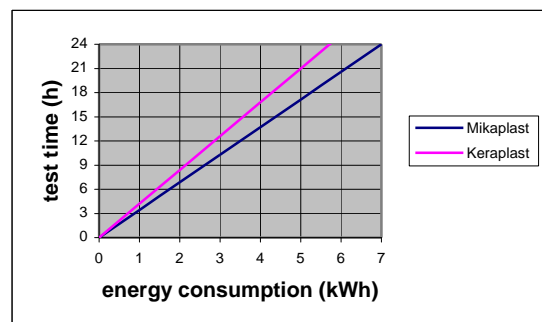
APPLICATIONS

These heaters are employed in all the plastic moulding machines whenever a high heating power is required. They are recommended for use in all the case where the operational temperature exceeds 280 °C.

TECHNICAL DATA (see Figure 1)

1. **RESISTIVE WINDING** spiral made of Nickel/Chrome 80/20 DIN 17470, material n° 4869, characterised by large section and consequent low power density,

2. **ELECTRICAL INSULATION** made of high purity ceramic KER 221 DIN 40685 which presents a high resistance to thermal shocks and a high dielectrical rigidity. The peculiar internal structure of the ceramic insures a rapid and uniform transmission of the heat. Thanks to the high temperatures which are reached and to the particular shape of the mosaic, the heat is transmitted both by conduction and radiation.
3. **CERAMIC TERMINAL BOARD** connecting the power supply cables to the internal electrical circuit. A special metallic cover protects the ceramic board from shocks and tearings applied to the cables
4. **INTERNAL INSULATION** made of fibreglass which allows to save electrical energy: the graph below shows, for a 24 hours working cycle, that saving that can be obtained if a KERAPLAST heater is used in place of a MIKAPLAST is about 20 %.



5. **INTERNAL SHEATH** made of galvanically treated steel resistant to high temperatures. Its compressing action onto the heating band guarantees an optimum heat exchange efficiency
6. **POWER SUPPLY CABLE** (optional) suitable for high temperatures, with internal conductors in nickel-plated copper or in pure nickel (for the most severe applications). Internal insulation made of fibreglass and Teflon. Externally protected by a metallic braid sheath.

POWER

KERAPLAST heaters are normally manufactured with a specific power of $4 \div 6 \text{ W/cm}^2$. In specific applications values as high as 8 W/cm^2 can be obtained.

INSTALLATION

Thanks to its very flexible structure this heater can be opened up to its diameter and then closed onto the cylinder by tightening the hexagonal-head screws provided with the heater itself.

In case of maximum adherence exigencies (and in any case, if the internal diameter exceeds 300 mm) closing systems provided with pressing springs are supplied (see Figure 2).

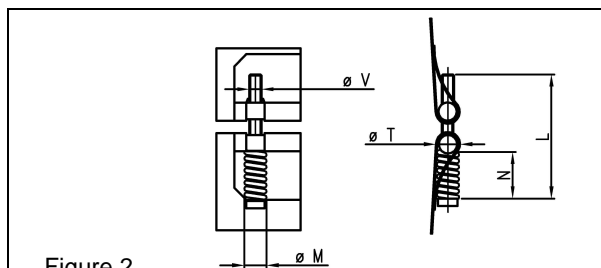


Figure 2

CLOSURE TYPE	ΦV	ΦT	ΦM	N	L
TR6/50	M6	12	12	15	50
TR7/100	M6	12	12	40	100

DIMENSIONS

KERAPLAST heaters can be manufactured starting from a minimum diameter of 70 mm. There are no specific limitations for the maximum diameter even if, beyond 500 mm, the best solution is to divide the heater into two or more sectors with separate power supplies.

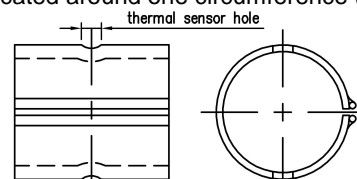
The heaters width is conditioned by the standard dimension of the blocks the mosaic is made of. Consequently the allowable width values are only those listed in the table below.

Standard Width (mm)					
23	106	188	271	353	436
31	113	195	278	360	443
38	121	203	286	368	451
46	128	210	293	375	458
53	136	218	301	383	466
61	143	225	308	390	473
68	151	233	316	398	481
76	158	240	323	405	488
83	166	248	331	413	496
91	173	255	338	420	503
98	181	263	346	428	511

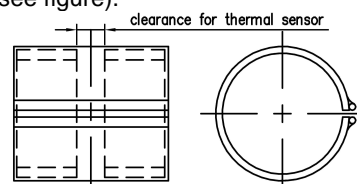
THERMAL SENSOR HOLE

The structure of KERAPLAST heaters can cause some difficulties in the realisation of holes or slots.

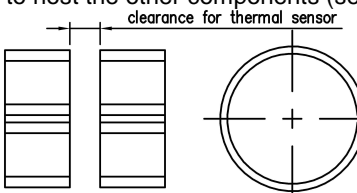
If more than one hole shall be foreseen, we recommend that they are all located around one circumference (see picture).



In this case, in fact, the heater will be divided into two separate parts, enclosed under a unique sheath and positioned such that interferences with the required openings are avoided (see figure).



Whenever possible, the best solution is to make use of 2 separate heaters and to leave free space in between as much as necessary to host the other components (see figure)


POWER SUPPLY

KERAPLAST heaters can be provided with mono-phase power supply and also with star (minimum width 53 mm) and delta (minimum width 120 mm) three-phase power supply. Solutions with double mono-phase power supply are possible too.

ELECTRICAL CONNECTION

To connect the internal heating circuit to the power supply cable, several terminal boards have been developed. They are provided with specific metallic covers and insure optimum mechanical resistance, easy mounting of the power supply cable, high electrical insulation, efficient electrical contact (also at high temperatures) and minimum envelope. Different typologies are available. They are summarised in Figure 3. The constructive details of each terminal board are provided in the Electrical Connections Catalogue.

TO ORDER A KERAPLAST HEATER PLEASE SPECIFY (see Figure 4):

- The diameter Φ
- The width L
- The supply voltage
- The heating power
- The position (in degrees and axial coordinate S) of the power supply and of any required hole. Please follow example in Figure 4 to define angular positions and axial coordinates
- The type of terminal board requested (see Figure 3 and Electrical Connections Catalogue)
- The length of the power supply cable (if required)

Figure 3: different typologies available for the electrical connection

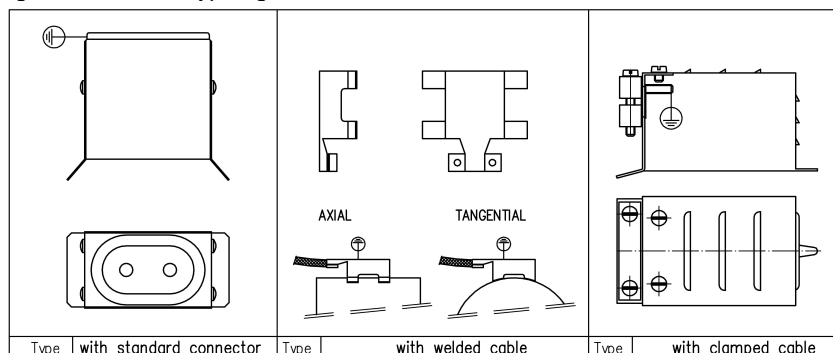
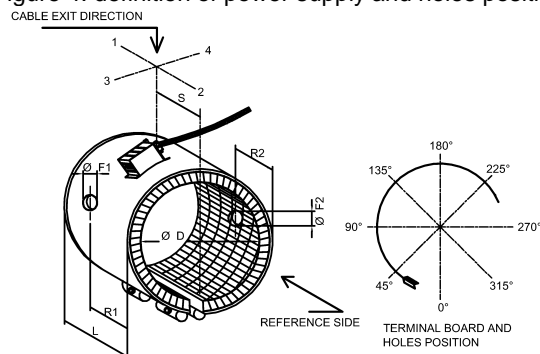


Figure 4: definition of power supply and holes positions



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