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# Технические характеристики на ТЕПЛОИЗОЛЯЦИОННЫЕ ПОКРЫТИЯ ISOTEX КОМПАНИИ MASTERWATT

# ISOTEX INSULATING BLANKETS



## **Isotex insulating blankets**

ISOTEX insulating blankets have been designed to protect, in the best way, the operators from the heat irradiating from the plastification cylinders. Made of a non conducting tissue padded with highly insulating material, they offer a very good thermal insulation of the plastification cylinder thus providing important savings in the request of electrical energy dedicated to heating: tests performed in our laboratory showed a saving of 30%. Thanks to their limited envelope (thickness = 15 mm) and to their high flexibility (typical in tissues) ISOTEX blankets can be installed where other types of insulating covers can not. The possibility to cut, in their surface, slots of different dimensions allows to employ ISOTEX blankets also in the cases where mechanical parts or temperature measurement devices alter the smoothness of the cylinder surface. ISOTEX blankets are largely used in the thermal insulation of plastification cylinders. Their flexibility, stability and resistance make them suitable for the insulation of other mechanical components like valves, flanges, expansion joints, and hot parts in general. They turn out to be useful in the most different types of plants: ovens, tanks, railway and industrial vehicles, naval plants and thermal stations.

### ISOTEX

#### - Insulating Blankets -

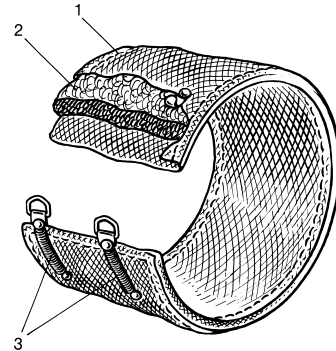


Figure 1

#### GENERAL CHARACTERISTICS

ISOTEX insulating blankets have been designed to protect, in the best way, the operators from the heat irradiating from the plastification cylinders.

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Amongst the advantages of ISOTEX blankets, the following can be listed:

- **High thermal insulation**
- **Non flammable**
- **Non toxic**
- **Incorruptible and stable in humid environment**
- **No absorbability of liquids**
- **Resistance to corrosion**
- **No chemical reactivity**
- **Stable mechanical and thermal characteristics, even at high temperatures**
- **Resistance to vibrations**
- **Low cost and easy installation.**

#### APPLICATIONS

ISOTEX blankets are largely used in the thermal insulation of plastification cylinders. Their flexibility, stability and resistance make them suitable for the insulation of other mechanical components like valves, flanges, expansion joints, and hot parts in general. They turn out to be useful in the most different types of plants: ovens, tanks, railway and industrial vehicles, naval plants and thermal stations.

#### TECHNICAL DATA (see Figure 1)

1. **EXTERNAL TISSUE** made of fibreglass suitable for high temperatures. It consists 100 % of a woof of type "E" fibreglass continuous threads (borosilicate with a low content of alkali) that undergoes a specific thermo-chemical treatment.

The tissue complies to U.S. military standard MIL-C-20079 and U.S. Coast Guard specification n° 164009 for non flammable materials.

2. **INTERNAL FELT** made of type "E" fibreglass suitable for high temperatures, mechanically stretched. It is a very compact felt, whose compactness is not obtained by chemical binders but is the result of a mechanical operation which produces a matelassé, very dense felt. Its insulation capability is very high and it is capable to operate to temperatures as high as 650 °C. The felt fulfils the requirements of the U.S. military specification MIL-I-16411 as well as of U.S. Coast Guard specification 164009 and of military specification MIL-I-2422 for non flammable and corrosion resistant materials. The main technical characteristics of this material are:

- Thickness: ½"
- Fibre Diameter: 6 micron
- Volume Density: 140 kg/m<sup>3</sup>
- Surface Density: 1.8 kg/m<sup>2</sup>
- Operating Temperatures: = 650 °C
- Weight loss at 650 °C: = 2%
- Thermal Conductivity: see Table

Temperature	Thermal Conductivity
205 °C	0.041 kcal/mh°C
260 °C	0.048 kcal/mh°C
315 °C	0.059 kcal/mh°C

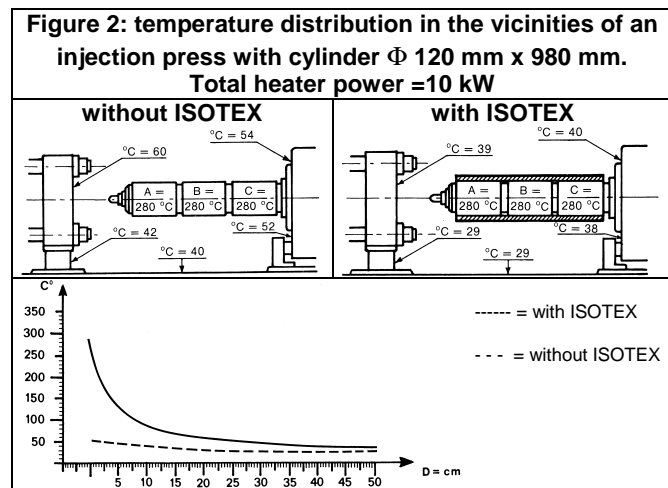
3. **SPRING STAYS AND FIXATION HOOKS** made of stainless steel AISI 302 resistant to high temperatures. This special material guarantees to the springs stays stable mechanical characteristics also after long periods of operation at high temperatures. Hooks, strings and eyelets are fixed onto the external surface of the blankets by through rivets.

#### THERMAL INSULATION OF PLASTIFICATION CYLINDERS

Insulating plastification cylinders by means of ISOTEX blankets reduces considerable the thermal radiation towards the surrounding environment and the machine mounting structure. A twofold result is therefore obtained:

1. the thermal expansion of the machine structural parts is reduced
2. the work area is more comfortable for the operator and presents no risks of accidental contact with high temperature zones.

The positive effects of ISOTEX insulating blankets have been measured in the frame of tests made on an injection press whose plastification cylinder had  $\Phi 120$  mm x 980 mm length dimensions and hosted three heaters for a total power of a 10 kW (see Figure 2).

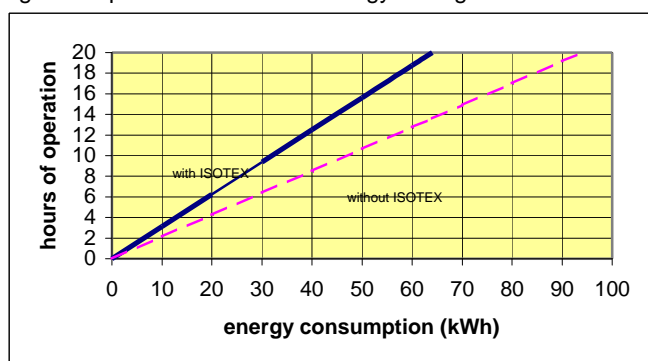


**ATTENTION!** The use of ISOTEX blankets on a plastification cylinder causes an increase of the surface temperature of the heaters beneath. If MIKAPLAST heaters are used, this effect imposes a reduction by  $0.5 \text{ W/cm}^2$  of the maximum allowable specific power (see MIKAPLAST catalogue).

### ENERGY SAVING

The good thermal insulation of the plastification cylinder offered by ISOTEX blankets provides important savings in the request of electrical energy dedicated to heating. Tests executed on an injection press whose plastification cylinder had  $\Phi 120$  mm x 980 mm length dimensions prove (see graph in Figure 3) that **the use of ISOTEX blankets allows to reduce by ~ 30 % the electrical energy needs.**

Figure 3: quantification of the energy saving



### DIMENSIONS

ISOTEX blankets can be produced starting from minimum dimensions of 100 x 10 mm. There are no specific technical limitations for what concerns maximum length and width. To define correctly the overall dimensions please consult section "TO ORDER AN ISOTEX BLANKET".

### SLOTS

Rectangular slots (minimum dimension 30 x 30 mm) can be cut onto the blanket surface as required. No circular-shape openings can be made.

To define correctly the slots dimensions and their position please consult section "TO ORDER AN ISOTEX BLANKET".

### INSTALLATION

Thanks to its flexible structure, the ISOTEX blanket can be directly wrapped around the part to be protected. It fits easily the most different shapes. To mount it, it is sufficient to lay it onto the surface to be insulated and to fix it by means of the provided spring hooks. If the blanket is mounted onto a cylindrical heater, start wrapping from the terminal board edge so that the power supply cable can exit between the two edges of the blanket.

**TO ORDER AN ISOTEX BLANKET PLEASE SPECIFY (see Figure 4):**

- The length L and the width H
- The dimensions (a, b) and the position of the centre (X, Y) of any slots that has to be cut onto the blanket surface

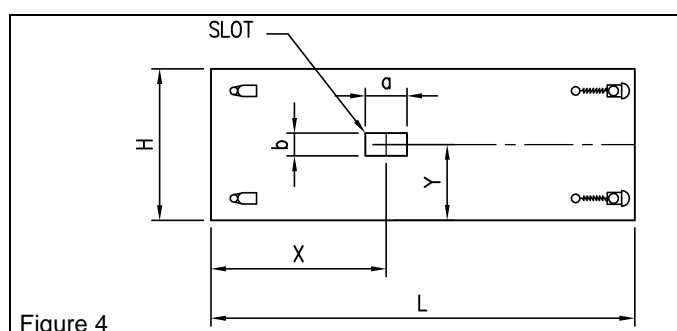


Figure 4

When cylindrical surfaces have to be insulated, the required blanket length can be calculated starting from the cylinder diameter and employing the following formula:

$$L = (\Phi_{est} + 20.9) / 0.321$$

where  $\Phi_{est}$  is the external diameter of the surface to be insulated.

### NOTE

- If the blanket shall be wrapped around a MIKAPLAST or a KERAPLAST heater, the following shall be kept in mind:

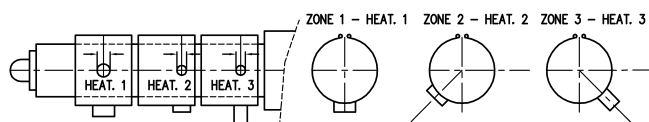
$$\Phi_{est} = \Phi_{cil} + 9 \quad \text{for MIKAPLAST heaters}$$

$$\Phi_{est} = \Phi_{cil} + 23 \quad \text{for KERAPLAST heaters}$$

where  $\Phi_{cil}$  is the plastification cylinder diameter.

- Slots dimensions shall be increased by at least 10 mm per side with respect to the minimum required. This will insure a correct installation of the blanket.
- In all cases, our technical department can define correctly the ISOTEX dimensions for you. Please provide a sketch of the item to be insulated (see example in Figure 5 relevant to a plastification cylinder)

Figure 5: plastification cylinder sketch suitable for the definition of ISOTEX blankets



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