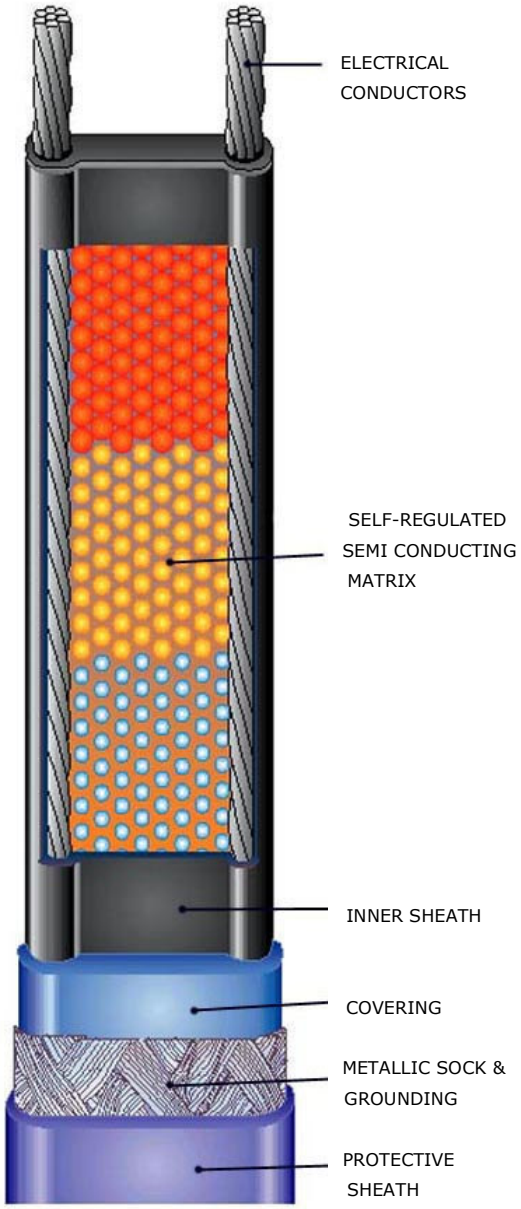
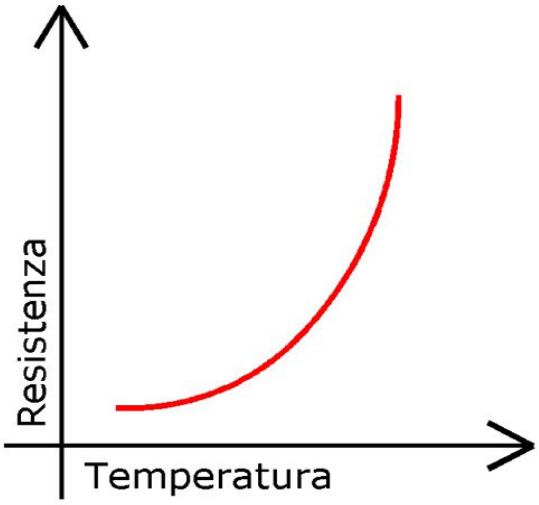
INSULATION

Astro tanks can be used for several applications because they satisfy the customers needs, composed by chemical company, pharmaceutical, cosmetic, food, textiles and inks, dry cleaning industry, sewage treatment plants, water, waste disposal facilities etc….

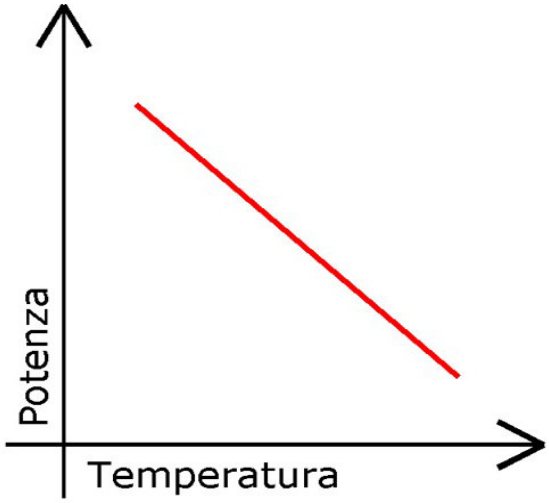
The operating temperature is generally between –20°C and +60°C, but in the last time we have also introduced new application : for example the use of heating cables and insulation.

Examined in detail you can see that
the cables are self-regulating heating cables
semi conducting matrix composed of a mixture
of graphite powder and extruded polymer
two conductors appropriate section
(about 1.25 mm), this matrix is
then irradiated to fix the molecular structure
and build a memory of its initial construction.
Is then covered with a sheath of polyolefin
(thermoplastic material) and a further
protection fluoride polymer or
thermoplastic material.
So this format is nothing more than basic cable.
This cable can then be covered with
a tinned copper braid or stainless steel
mechanical protection and earthing,
and finally by a final coating or
Fluor polymer plastic material
(see figure at right).
The carbon particles are between
live conductors numerous current paths.
With increasing temperature,
the plastic material of the semiconductor
expands interrupting the flow of carbon
from the current formats.
It follows an increase in electrical resistance,
decreasing power consumption and heat generated
When the ambient temperature,
the plastic retires, again restoring the links.
The decrease in electrical resistance increases
the current consumption and hence
the heat generated.
Self-regulating heating tapes to provide
every point of the circuit, even when
temperature and subject to frequent change,
the right heat necessary.
Its adaptability to individual needs
severely limiting the heat consumption
energy and thus the cost of heating.





With temperature increasing, the resistance increases.



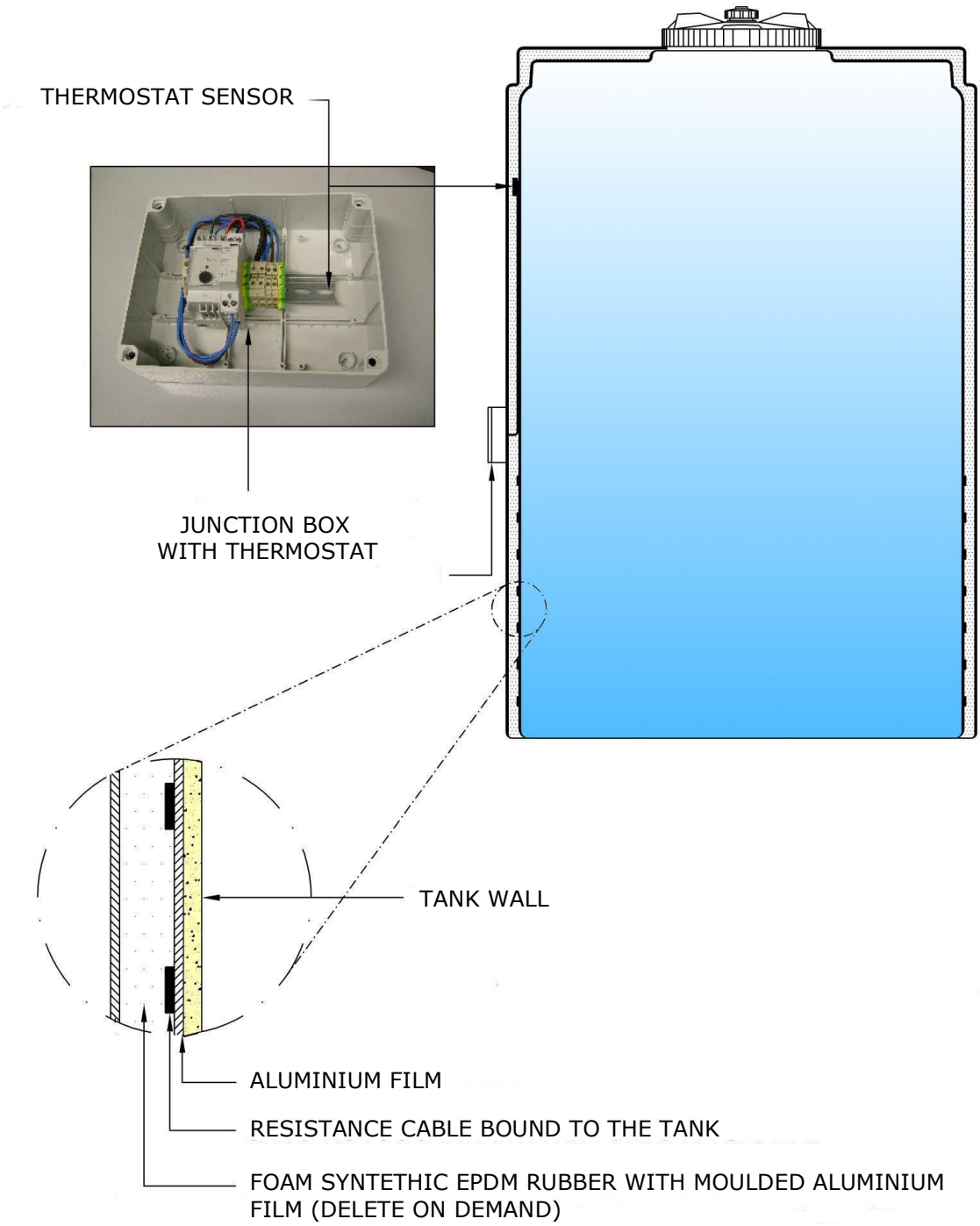
With temperature increasing the power consumption decreases.

This not happen in conventional heaters and with temperature increasing the power remains unchanged.

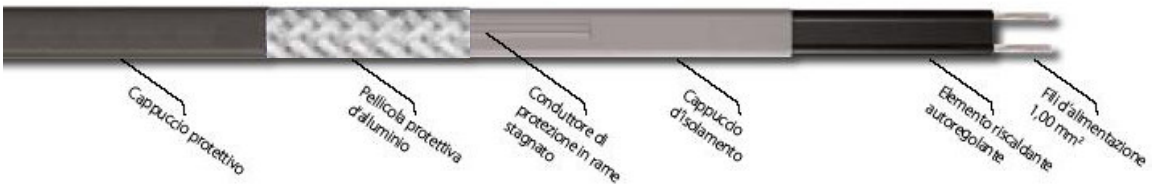
The self regulating heating cable provides to us:

- A reduction of the overall cost of installation, also can be powered by 230V to its maximum length of each cable without the need for transformers.
- A reduction of operating cost given that his power is automatically reduced when the required temperature is reached.
- A great ease of assembly having its easy design as it can be cut, spliced and derived directly on site with a very small footprint.
- A heat supply individually controlled at each point.
- The total absence of risk of overheating since it can be overlaid to itself secure.
- Total reliability.

In the drawing here below it's possible to see how the tank will be assembly with insulation and heating system :



Here below, there are the technical information of the heated cable ***ELSR-N-40-2*** that it's used on the tanks.

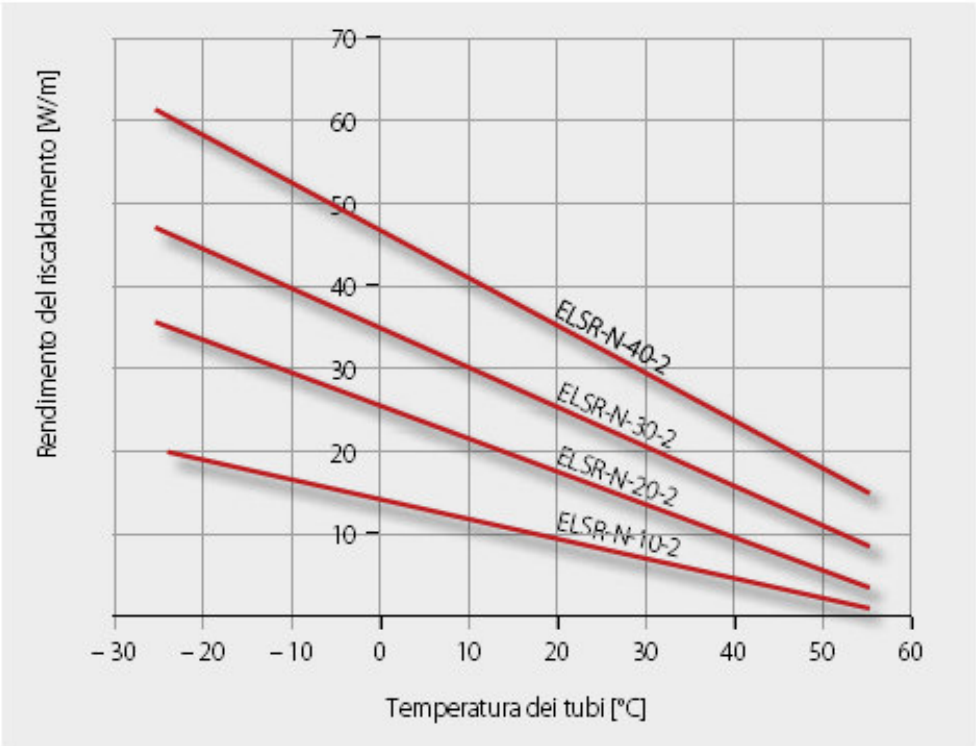


Type : ELSR-N-40-2-AO

Structure : Aluminum sheet and external covering thermoplastic

Protective covering: TPE-O

Power conductor: Cu nickel
Maximum surrounding temperature admitted (off): 80°C
Maximum permissible temperature around (on): 65°C
Rated voltage: 230 V
Minimum curve radius of 25 mm
Transfer temperature: min. -45°C
Nominal power: 40 W/m from 10°C
Dimensions: 13.6 mm x 5.5 mm
Weight: 91 g/m



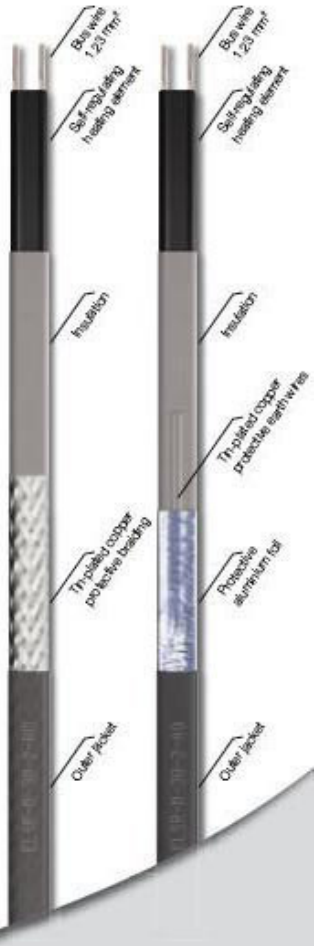
Type ELSR-N up to 80 °C

Design:

BO: Protective braiding and a thermoplastic outer jacket
AO: Aluminium foil and a thermoplastic outer jacket
BOT: Protective braiding and a fluoropolymer outer jacket

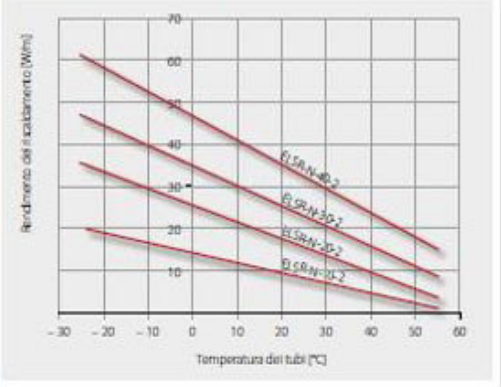
Technical data:

Outer jacket . . . . . TPE-O
Bus wire . . . . . Cu nickel-plated
Maximum exposure temperature (deenergised) . . 80 °C
Maximum exposure temperature (energised) . . . . 65 °C
Nominal voltage . . . . . 230 V
Bending radius minimum . . . 25 mm
Minimum installation temperature . . . . . – 45 °C
Ⓔx II 2 G Ex e II II Ⓔx 2 D Ex tD A21 Tmax 80 °C



Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Item number
ELSR-N-10-2-AO	10 W/m at 10 °C	13.6 x 5.5	91	B0200130
ELSR-N-10-2-BO	10 W/m at 10 °C	14.1 x 5.8	108	B0200110
ELSR-N-10-2-BOT	10 W/m at 10 °C	13.8 x 5.6	108	B0200120
ELSR-N-20-2-AO	20 W/m at 10 °C	13.6 x 5.5	91	B0200230
ELSR-N-20-2-BO	20 W/m at 10 °C	14.1 x 5.8	108	B0200210
ELSR-N-20-2-BOT	20 W/m at 10 °C	13.8 x 5.6	108	B0200220
ELSR-N-30-2-AO	30 W/m at 10 °C	13.6 x 5.5	91	B0200330
ELSR-N-30-2-BO	30 W/m at 10 °C	14.1 x 5.8	108	B0200310
ELSR-N-30-2-BOT	30 W/m at 10 °C	13.8 x 5.6	108	B0200320
ELSR-N-40-2-AO	40 W/m at 10 °C	13.6 x 5.5	91	B0200430
ELSR-N-40-2-BO	40 W/m at 10 °C	14.1 x 5.8	108	B0200410
ELSR-N-40-2-BOT	40 W/m at 10 °C	13.8 x 5.6	108	B0200420

Prestazione di ELSR-N-...-2
(su tubi metallici isolati secondo EN 62395-1)



Lunghezze del circuito di riscaldamento ELSR-N-...-2
In considerazione di
- tensione nominale 230 V
- con interruttore di sicurezza (caratteristica C) con massimo utilizzo 80%
- Caduta di tensione max. 10% al conduttore d'alimentazione del riscaldamento
- Un (1) condutture di riscaldamento, alimentato unilateralmente

Temperatura d'accensione (°C)	Valore nominale Sicurezza (A)	Lunghezza del circuito di riscaldamento (m) per ELSR-N-10-2	ELSR-N-20-2	ELSR-N-30-2	ELSR-N-40-2
10	16	177,0	109,0	83,0	57,0
	20	177,0	129,0	104,0	71,0
	25	177,0	129,0	113,0	89,0
0	16	160,0	92,0	71,0	50,0
	20	160,0	115,0	89,0	62,0
	25	160,0	119,0	105,0	78,0
-10	16	144,0	79,0	63,0	44,0
	20	149,0	99,0	78,0	55,0
	25	149,0	111,0	98,0	69,0
-20	16	125,0	70,0	56,0	40,0
	20	139,0	87,0	69,0	50,0
	25	139,0	104,0	87,0	62,0
-40	16	99,0	56,0	45,0	33,0
	20	124,0	71,0	57,0	42,0
	25	124,0	88,0	71,0	52,0

EC Declaration of Conformity

Issuer's name and address:

eltherm
Elektrowärmetechnik GmbH
Ernst-Heinkel-Strasse 8-10
57299 Burbach

Product: Self regulating, self-limiting parallel heating cable

Type designation: NH1PXTPE QU TPE 80-10 (ELSR-N-10-2 BO); NH1PXTPE QU TPE 80-20 (ELSR-N-20-2 BO); NH1PXTPE QU TPE 80-30 (ELSR-N-30-2 BO); NH1PXTPE QU TPE 80-40 (ELSR-N-40-2 BO); NH1PXTPE QU TPE 65-10 (ELSR-M-10-2 BO); NH1PXTPE QU TPE 65-15 (ELSR-M-15-2 BO); NH1P TPE QU TPE 55-19 (ELSR-R-19-2 BO); NH1PXTPE QU TPE 65-15 (ELSR-L-15-2 BO); NH1PXTPE QU TPE 65-25 (ELSR-L-25-2 BO); NH1PXTPE QU TPE 65-30 (ELSR-L-30-2 BO)

The designated product is in conformity with the European Directive:

2006/95/EC

"Council Directive on the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits".

Full compliance with the standards listed below proves the conformity of the designated product with the provisions of the above-mentioned EC Directive:

DIN VDE 0254:1994-06

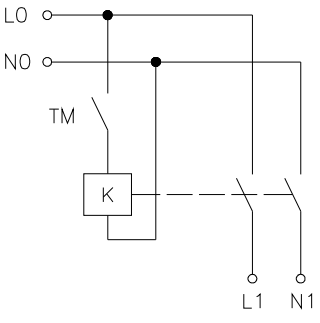
The VDE Testing and Certification Institute (EU Identification No. 0366), Merianstr. 28, D-63069 Offenbach, has tested and certified the product granting the VDE Approval for the mark(s) as displayed.

und/oder - and/or ◁VDE▷ oder/or ◁▷⌂ω▷

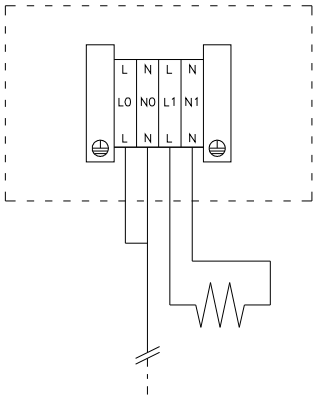
Certificate No. 97033
File Reference 2044400-5040-0001 / 88893 FG41 / LR

Burbach, 06.06.2007
(Place, Date)

(Legally binding signature of the issuer)



K *Contactor 20A*
TM *thermostat contact*
LO *Line 220/240V*
NO *Line 220/240V*
L1 *Heating cable*
N1 *Heating cable*

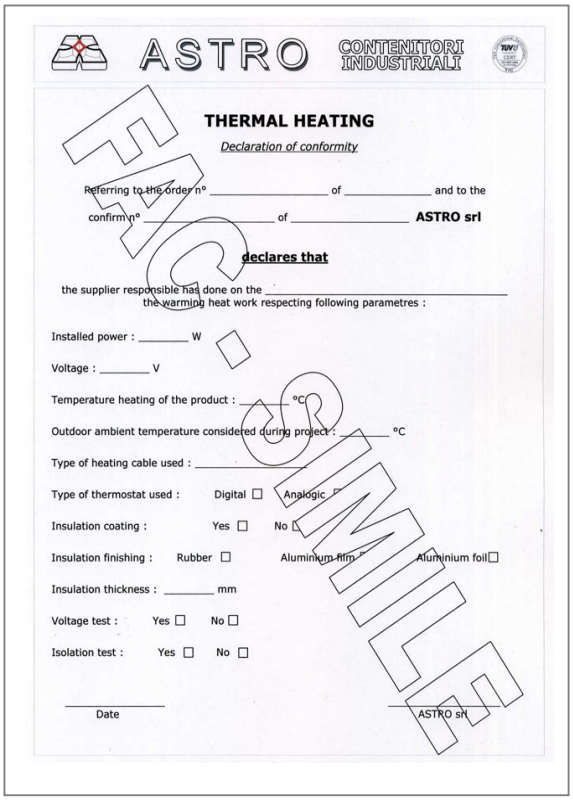


Particular of the Juctiont box

In addition to the insulation by heating with heating cables can equip Astro tanks only for thermal insulation.

In this case, the tank will have no cable and no heating thermostat control, but will simply be wrapped by rubber insulation and possibly from the aluminum foil.

In both cases (with heating or insulation thermal insulation) Astro issue still a Certificate of Conformity that in addition to specifying the characteristics of installed attests controls functioned properly executed on it.



ASTRO CONTENITORI INDUSTRIALI

THERMAL HEATING

Declaration of conformity

Referring to the order n° _____ of _____ and to the confirm n° _____ of _____ **ASTRO srl**

declares that

the supplier responsible has done on the _____ the warming heat work respecting following parametres :

Installed power : _____ W

Voltage : _____ V

Temperature heating of the product : _____ °C

Outdoor ambient temperature considered during project : _____ °C

Type of heating cable used : _____

Type of thermostat used : Digital ☐ Analogic ☐

Insulation coating : Yes ☐ No ☐

Insulation finishing : Rubber ☐ Aluminium film ☐ Aluminium foil ☐

Insulation thickness : _____ mm

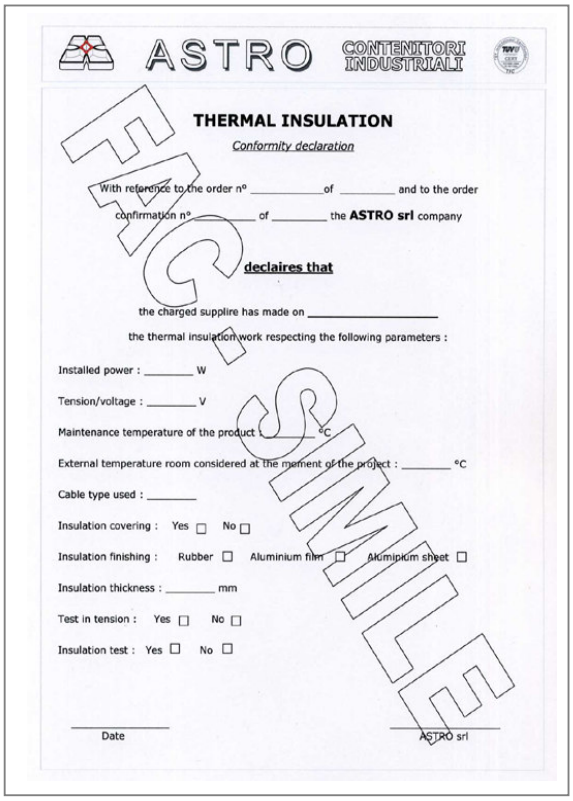
Voltage test : Yes ☐ No ☐

Isolation test : Yes ☐ No ☐

Date _____ ASTRO srl

FAC SIMILE

Conformity Certificate emitted by Astro concerning an insulation job with heating



ASTRO CONTENITORI INDUSTRIALI

THERMAL INSULATION

Conformity declaration

With reference to the order n° _____ of _____ and to the order confirmation n° _____ of _____ the **ASTRO srl** company

declaires that

the charged suppliire has made on _____

the thermal insulation work respecting the following parameters :

Installed power : _____ W

Tension/voltage : _____ V

Maintenance temperature of the product : _____ °C

External temperature room considered at the moment of the project : _____ °C

Cable type used : _____

Insulation covering : Yes ☐ No ☐

Insulation finishing : Rubber ☐ Aluminium film ☐ Aluminium sheet ☐

Insulation thickness : _____ mm

Test in tension : Yes ☐ No ☐

Insulation test : Yes ☐ No ☐

Date _____ ASTRO srl

FAC SIMILE

Conformity Certificate emitted by Astro concerning an insulation job of thermic isolation