TEKNOWOOL®
ISOLANTI TERMOACUSTICI E NANOTECNOLOGIE

CASE STUDY

DATE September 2013

CUSTOMER : BITUMTEC SRL – TOTALERG GROUP – ISOLGAMMA SRL

SUBJECT : INSULATION OF DIATHERMIC CIRCUIT OUTSIDE

MANUFACTURER: CRISTIANO GATTI
PERFORMED BY: ISOLGAMMA SRL

LOCATION : VOLPIANO (TO) ITALY

Parameters :
Circuit lenght : 55 ml
Pipes dimensions : 3 inches
Insulation products : 1st layer – Pyrogel xt plus thickness 10 mm
2nd layer – Spaceloft thickness 10 mm
Covering product : SOLARTECH PE 55
Inside oil temperatures : 210 ° C
Outside temperature : from – 10 to 35 °C

Target :
1. Heat loss reduction by minimum thickness of insulation material.
2. Heavy duty covering installation to reduce the problem against weather conditions
3. Reduction of installation times and comparison with traditional insulation system
4. Safety temperature on the covered surface

Test : 24 hours in different weather conditions and with different outdoor temperatures

INSTALLATION :

First of all the installators prepare all the insulation pieces in warehouse according to the plant's layout (elbows , derivation , ecc. Included).
The first layer of the insulation is performed by Pyrogel xt plus , an insulating product made by air ,silica aerogel , glass fiber , and doped by iron dioxide . The layer has a thicknes of 10 MM with a Lamba value around 0,023 W /mK- at 100 °C
The second layer of the insulation is performed by Spaceloft , an insulating material made by nanoporous aerogels , air , and pe fibers . The layer has a thicknes of 10 mm with a Lambda value around 0,0136 W/mK at 40°C
The installation on the pipes surface was made by tying with wire or by a mechanical crimping .
To avoid thermal bridges , two layers with staggered joints need to be installed.
After the insulation installation the covering layer with solartech has been made.
This product is a sheet lamintaes of Uv Curing Glass Reinforced Plastic products .
The thicknes of this layer is 1,7 mm and the material is in uncured state , soft and malleable and ready for application.
In this case too , It s possible to prepare all the pieces in warehouse and in a second time proceed with the installation .
This product is highly photosensible and during the installation it is necessary cover the work site with an uv shield (a black tissue could be good) . After the installation, in very short time , the product changes his state and after the polymerization , the product becomes extremelly hard and weatherproof. In all situation , the product can be used on a walkable pipes.

TIME OF INSTALLATION :

If the installation is perfomerd by a specialist , the time required to install is considerably lower than a traditional product. This is mainly due to the very small size of the insulating pieces compared to the traditional products . This allowing a fastest installation.

INSTALLATION : IMAGES

Installation on standing surface

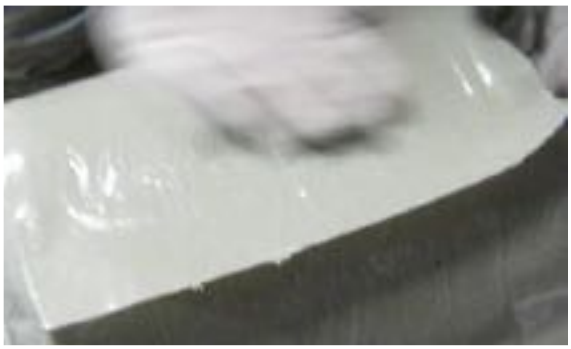
Installation on elbow

Multilayer installation

Elbow preparation

Elbow preparation

Solartech



Solartech Covering

TEST :

Below some test datas:

The synthesis has been formulated on a database of 17243 values / day (available upon request)

As we can see , the result are absolutely in line with our targets :

DAY 10TH OCTOBER 2013
TEMPERATURE : MIN 9°C ; MAX 17°C ; MED 12°C
HUMIDITY : 89%
WIND SPEED : 7 KM/H
WEATHER CONDITIONS : FOGGY

REL. TIME HOUR	OIL TE ARRIVE °C	OIL TE START °C	DELTA TEMPERATURE °C
00:00:03	206	206	0
06:00:00	206	206	0
12:00:04	206	206	0
18:00:01	205	205	0
23:59:58	208	209	1

DAY 10TH NOVEMBER 2013
TEMPERATURE : MIN 4°C ; MAX 13°C ; MED 9°C
HUMIDITY : 61%
WIND SPEED : 15 KM/H
WEATHER CONDITIONS : PARTIALLY CLOUDY

REL. TIME HOUR	OIL TE ARRIVE °C	OIL TE START °C	DELTA TEMPERATURE °C
00:00:04	206	206	0
06:00:01	207	206	1
12:00:03	208	208	0
18:00:59	207	207	0
23:59:56	206	206	0

DAY 10TH DECEMBER 2013
TEMPERATURE : MIN -3°C ; MAX 10 °C ; MED 3°C
HUMIDITY :72%
WIND SPEED : 5 KM /H
WEATHER CONDITIONS : PARTIALLY CLOUDY

REL.	OIL	OIL	DELTA
TIME	TE ARRIVE	TE START	TEMPERATURE
HOUR	°C	°C	°C
00:00:02	208	208	0
06:00:04	208	208	0
12:00:00	205	205	0
18:00:02	207	207	0
23:59:58	205	204	1

DAY 10TH FEBRUARY 2014
TEMPERATURE : MIN 2°C ; MAX6°C; MED 4°C
HUMIDITY : 80%
WIND SPEED : 12 KM/H
WEATHER CONDITIONS : RAINY

REL.	OIL	OIL	DELTA
TIME	TE ARRIVE	TE START	TEMPERATURE
HOUR	°C	°C	°C
00:00:01	210	209	-1
06:00:03	210	210	0
12:00:00	210	210	0
18:00:01	210	209	1
23:59:58	210	210	1

REMARKS :

The temperatures gap (from start point to arrive point , after 55 ml) are always lower than 1°C during the day .
This condition allows an optimal use of heat generator for the heating of diathermic oil and the subsequent optimization of fuel consumption.
All the pipes are properly insulated and also with the system infunction we can reach and touch the surfaces without problem in smoothly and total security.

The customer is higly satisfied about the Solartech coverage by that resist to UV rays and to different weather conditions allowing , above all , to work near the pipe lines without problem of damage.

The customer has presented this solution during a meeting in Hamburg , and raised interest in the installation also by others European partners who have already requested information about the opportunity to make the same insulation in their plant .

Presentation By Btitumtec / Totalerg in Hamburg slide

Immage of the insulated valves

Images of the plant in Volpiano .