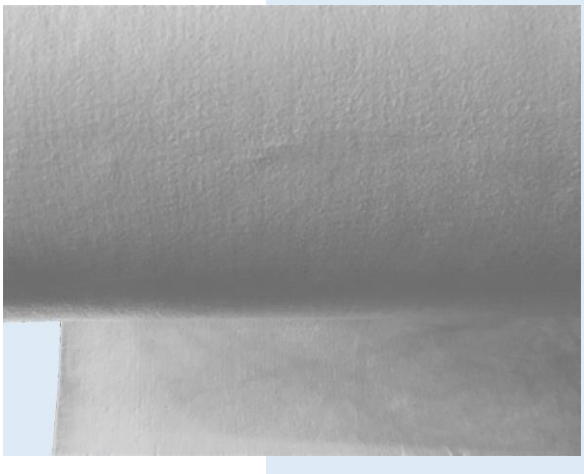
REFIAL®
Refractory Insulation Solutions

*Your partner in economical and **high-performance**, **high temperature resistant** and **fireproof insulation** for your applications and thermal industrial processes .*

REFIAL® -AEROMAT

Aerogel Insulation Blankets for the industry



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REFIAL®-AEROMAT

Microporous Aerogel insulation mats.

REFIAL®-AEROMAT *is a high-temperature insulation mat , based on a microporous gel and reinforced with a non-woven, glass-fiber batting .* **REFIAL® -AEROMAT** *has the lowest thermal conductivity of any known solid.*
REFIAL® -AEROMAT *has a an application temperature of -200°C to +650°C and a density of around de 180 kg/m³.*
REFIAL® -AEROMAT *is a flexible, environmentally safe and easy to use insulation blanket , ideal for insulating piping , vessels, tanks, and equipment.*
REFIAL® -AEROMAT *can be used for oil refineries , chemical industry, power stations, piping solutions, and insulation for all kind of equipment, aeronautics , ….*
REFIAL® -AEROMAT *is available in standard thickness of 3, 6 and 10 mm.*

Technical data

Brand	**REFIAL® -AEROMAT HT650**
Colour	*White/Beige*
Maximum application temperature *Recommended Service Temperature °C*	*650°C* *100°C -550°C*
Linear shrinkage under soaking heat	*≤ 2% in width and Length*
Density (kg/m³)	*190 kg/m³ (±15 kg/m³)*
Compressive Strength @10% reduction in thickness	*20,7 KPa*
Tensile Strength	*1000 KPa*
Hydrophobicity	*≥ 98%*
Mass hygroscopicity	*≤ 5%*
Water absorption at room temperature	*± 8%*
Wator vapour absorption (at room	*< 5% by weight*
Stress corrosion cracking-ASTM C692, ASTM C795	*Insulation for use over austenitic steel: no cracks, passed*
Corrosivess of steel – ASTM C1617, procedure A	*Passed, mass loss corrosion Rate (MLCR) not exceeding that of 5 ppm chloride solution on a carbon steel coupon*
Weather resistance	*In all industrial applications, the outer layer of the insulation must be protected with an adequate covering like metal jacketing.*
Health aspects	*Neutral, MSDS available on request*
Fungal resistance	*No growth*
Loss on Ignition	*≤ 5%*
Thickness	*3-6-10 mm*
Width	*1500 mm ± 5 mm*
Length m/roll	*36 m (3 mm) – 36 m (6 mm) – 36 m (10 mm)*

Thermal conductivity

Mean Temp. °C	*25*	*200*	*300*	*400*	*500*	*650*
W/mK	*0,021*	*0,028*	*0,035*	*0,045*	*0,072*	*0,095*

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Features and Benefits

- *Extremely low thermal conductivity over a wide temperature range*
- *4-5 times better performance than conventional insulation*
- *High thermal stability*
- *Low in weight*
- *Inorganic and non-combustible*
- *Shock and vibration resistant*
- *Quick and easy to install*
- *Space saving in and around congested areas or closely spaced pipe clusters.*
- *Breathable hydrophobic flexible blanket that will not crack and will retain its integrity throughout high temperature service*
- *Can be re fitted after removal and inspection*
- *Slim and fitted insulation thickness*
- *Flexible and versatile shapes choices*
- *Environmentally friendly*
- *No harmful respirable fibres*

Typical Applications

- *Power Generation, Refining and chemical Processing Industries*
- *Process piping*
- *Vessels*
- *Storage tanks and equipment*

Insulation thickness (mm) in function of Process Temperature and Nominal Pipe diameter

NPS Inch	NPS mm	100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C	500°C	550°C	600°C
0,5	15	5	5	5	10	10	15	15	20	20	25	30
0,75	20	5	5	5	10	10	15	15	20	25	30	35
1	25	5	5	10	10	15	15	20	25	30	35	40
1,5	40	5	5	10	10	15	20	20	25	30	40	45
2	50	5	5	10	15	15	20	25	30	35	40	50
3	80	5	10	10	15	20	25	30	35	40	50	60
4	100	5	10	10	15	20	25	30	35	45	55	65
6	150	5	15	15	20	25	30	35	45	50	60	75
8	200	5	15	15	20	25	30	40	45	55	70	80
10	250	5	15	15	20	25	35	40	50	60	75	85
12	300	5	15	15	20	30	35	45	55	65	75	90
14	350	5	15	15	25	30	35	45	55	65	80	95
16	400	5	15	15	25	30	40	45	55	70	80	100
18	450	5	20	20	25	30	40	50	60	70	85	100
20	500	5	20	20	25	30	40	50	60	75	90	105
24	600	5	20	20	25	35	40	50	65	75	90	110
28	700	5	20	20	25	35	45	55	65	80	95	115
30	750	5	20	20	25	35	45	55	65	80	95	115
36	900	5	20	20	30	35	45	55	70	85	100	120
48	1200	10	20	20	30	40	50	60	75	90	105	130

Ambient temperature: 86°F (30°C), Wind speed: 2;2 mph (1m/s), Surface emissivity: 0,15 , max. outside surface temperature : 140°F (60°C)

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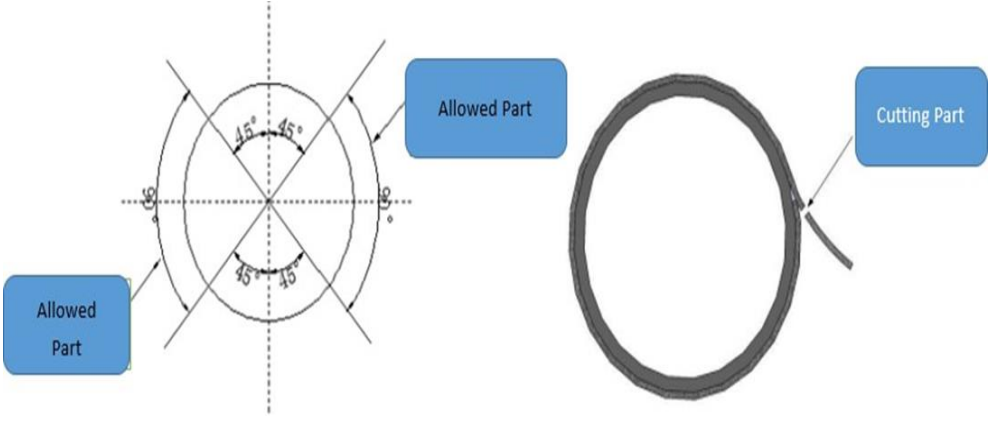
Installation of REFIAL®-AEROMAT *for piping Lines*

One Layer Insulation Installation :

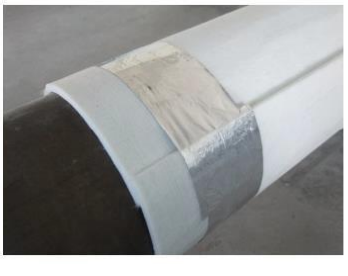
1) *The joint seaming part /claddings of* **REFIAL®-AEROMAT** *blankets cannot be fixed within the scope of vertical center line of the pipes.*

2) *Fix the* **REFIAL®-AEROMAT** *blanket into the accurate length needed for the total wrapping of the pipe ;the length can be measured through direct wrapping. The joint areas will be controlled at about 10-20mm.*

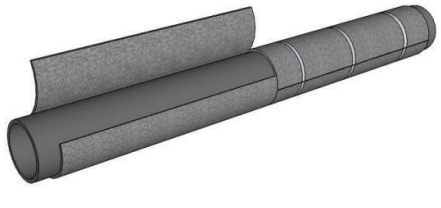


3) *Attaching on the surface tightly , wrap the blankets . Make sure firstly fix the starting part of the blanket fasten with galvanized iron tire (Φ0.5mm /Φ1mm) or high temperature resistant glue, then operate accordingly the same in the ending part while finished.*

4) *Then spirally fasten the fiber cloth even on the surface of pipes , in the same orientation with the blankets, the cladding parts of the jointing will be controlled appropriately at 1/2 of its own width. Fabric cloth with width at 10-30cm will be suggested.*

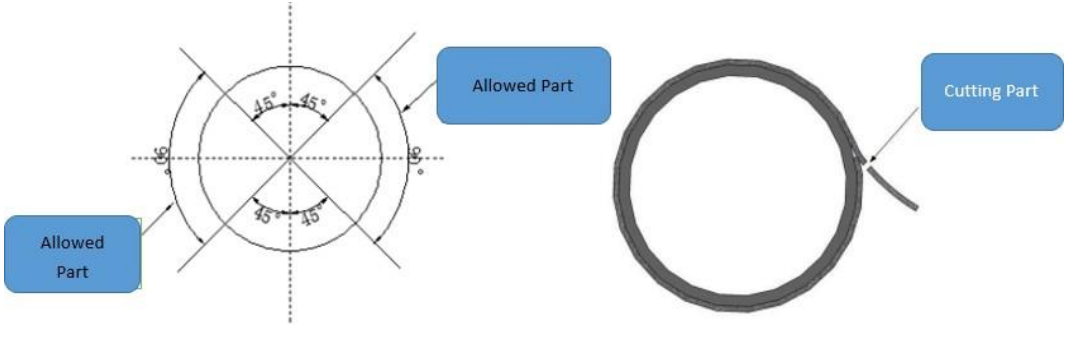


5) *The jointing layers of each aerogel blanket in the length direction will be tiled staggered and overlapping. Finally a protective mental(Aluminium) framework will be covered.*



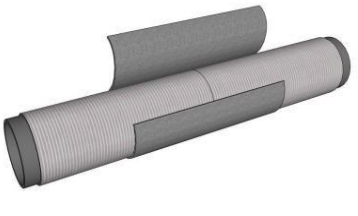
Multi-layers insulation solutions

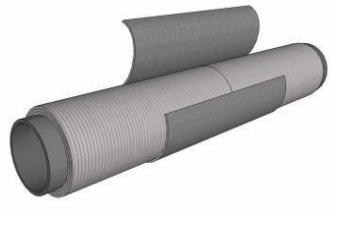
1) *The joint seaming part /claddings of aerogel blankets cannot be fixed within the scope of vertical center line of the pipes.*
2) *Fix the* **REFIAL®-AEROMAT** *blanket into the accurate length needed for the total wrapping of the pipe ;the length can be measured through direct wrapping. The joint areas will be controlled at about 10-20mm.*



3) *Attaching on the surface tightly , wrap the blankets . Make sure firstly fix the starting part of the blanket fasten with galvanized iron tire (Φ0.5mm / Φ1mm) or high temperature resistant glue, then operate accordingly the same in the ending part while finished.*

4) *Then spirally fasten the fibre cloth even on the surface of pipes , in the same orientation with the blankets, the cladding parts of the jointing will be controlled appropriately at 1/2 of its own width. Fabric cloth with width at 10-30cm will be suggested.*
5) *Staggering position of Adjacent two layers should be at a position of 1/2 of the blanket's width. Finally a protective metal layer framework will be covered.*





Note: When the hot side in the pipeline is too high within the allowed temperature range（280℃≤T＜550℃), a reflective aluminium foil layer can be attached on the surface of the pipes / the aerogel blanket.

Pipe Ends InstallationSteps:

1) *Wrap the* **REFIAL®-AEROMAT** *strips in the pipe endings, make sure the diameters of the strips circle and the Pipe ends opening are equivalent, then fasten the strips with galvanized iron tire/ steel belts.*

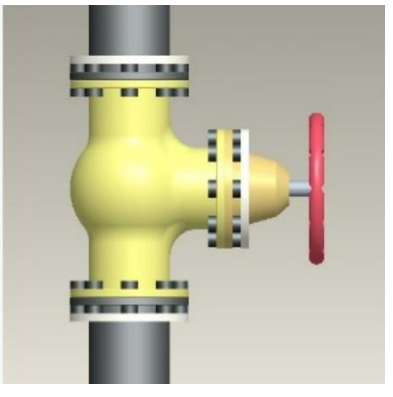
2) *Tile a layers of* **REFIAL®-AEROMAT** *blanket layer outside of the aerogel strips and the openings, to maintain the insulation requirement, sometimes round shape aerogel s slice can be optional to cover the opening. Fix with galvanized iron tire /steel belts the* **REFIAL®-AEROMAT** *blanket, as well as* **REFIAL®-AEROMAT** *slice if needed.*

3) *Metal protective framework installed finally.*

Valves and Flanges installation Steps :

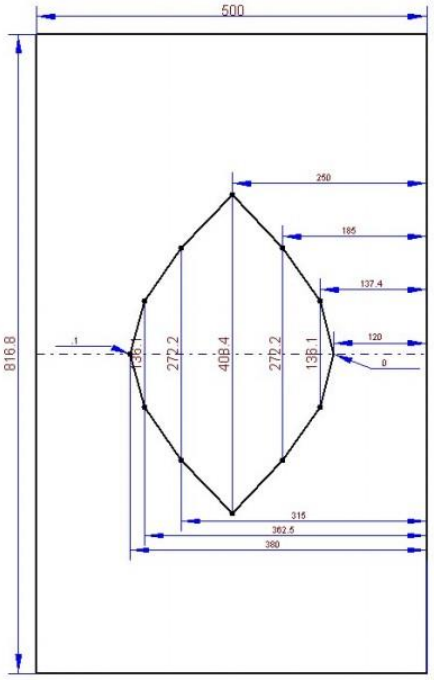
In the following steps, trimmed **REFIAL®-AEROMAT** *blankets can be installed on the valves and flanges according to the cross-section drawings .*

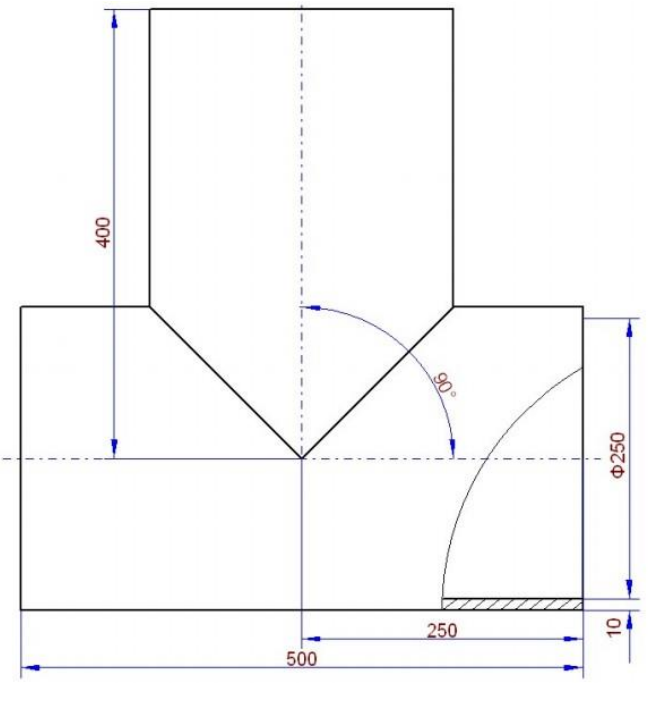
1) *Wrap the jointing parts between flanges and the connection point of the pipes, making it at same diameter size with the connection joint. Applying the same to flange bonnet, then fasten tightly with galvanized iron tire / steel belts.*

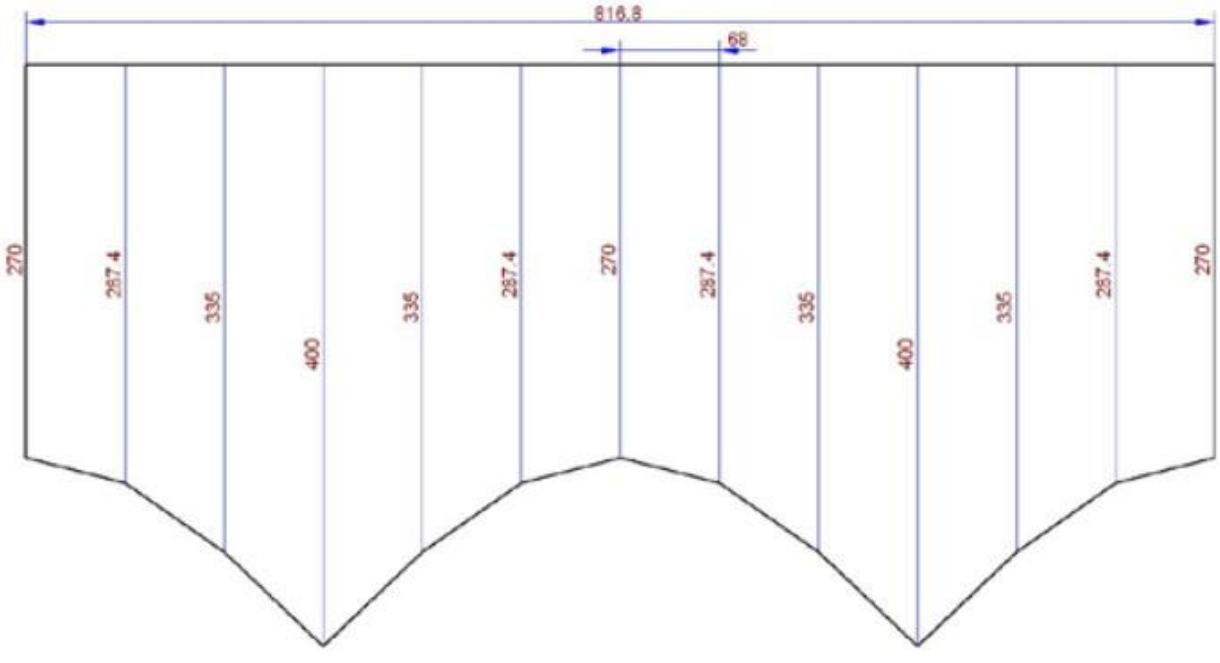


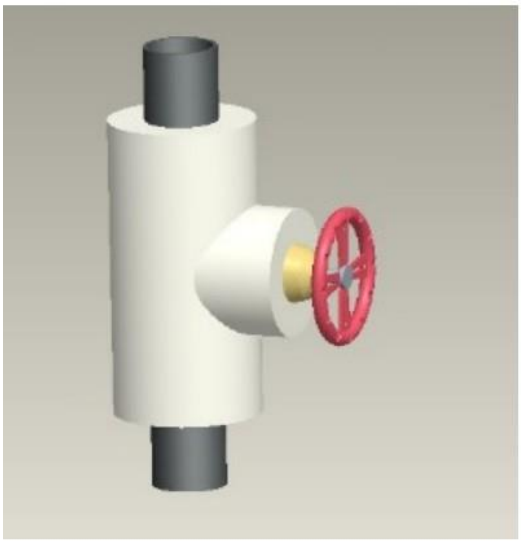
2) *Assuming the valve flange and the aerogel strips as a T-Joint, measure the size of the T-Joint. Trim the* **REFIAL®-AEROMAT** *blanket into customized strips based on the T-Joint Cross section drawing,*
3) *Fix the strip with galvanized iron tire / steel belts closely.*

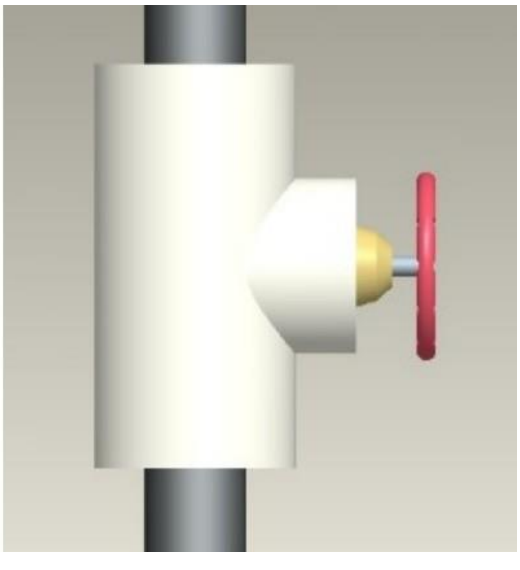
TIPS: The internal voids in T-Link can be filled with aerogel strips , for a better insulation.











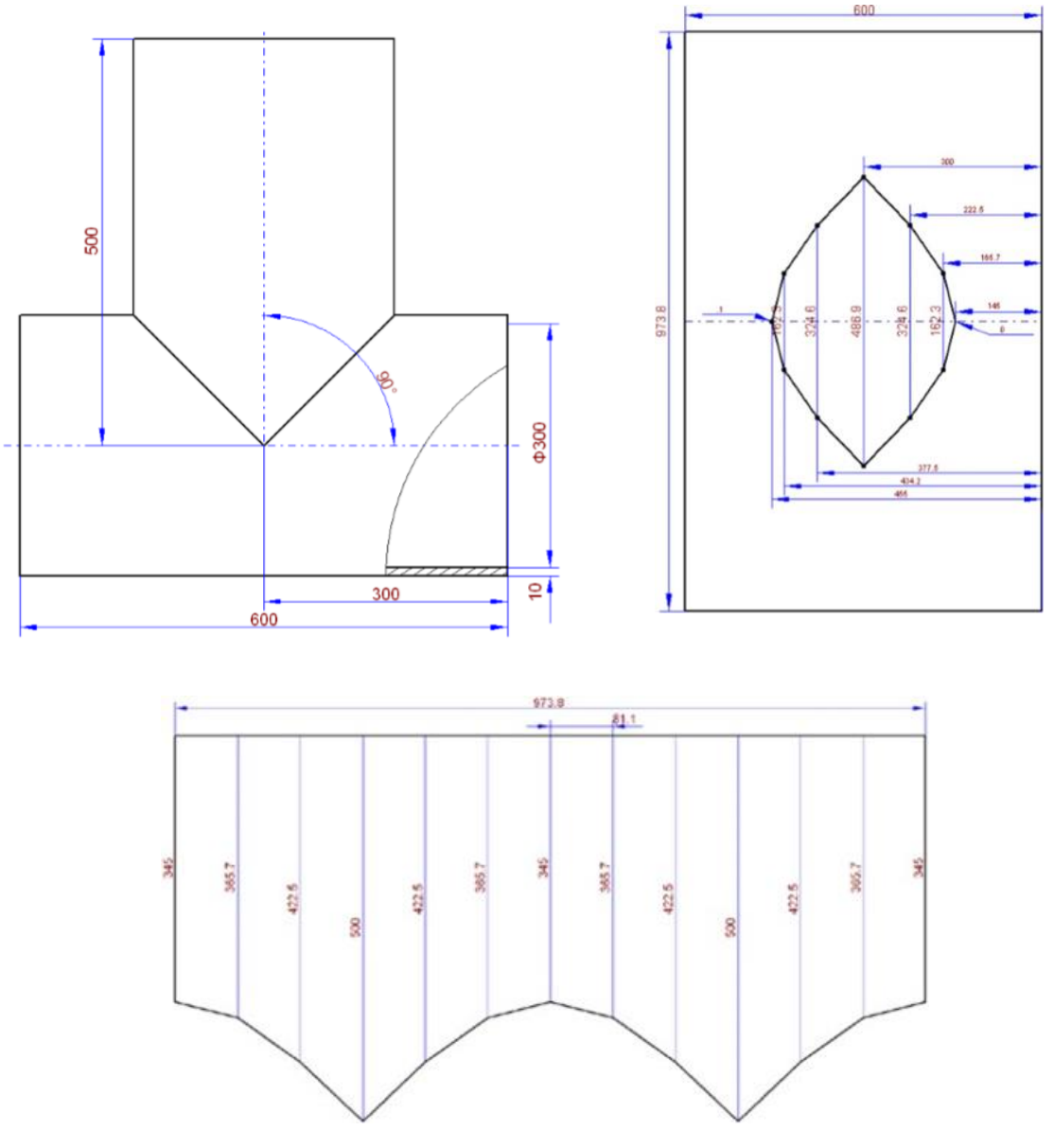
4) *It is suitable for two or more layers aerogel blankets needed.*
5) *Making staggered layers while using more layers, and fix tightly with galvanized iron tire/Steel belts*
6) *Metal Protective framework installed*

Installation Steps of T- Joint:

In the following steps, trimmed aerogel blankets can be installed on T-joints according to the cross-section drawings.

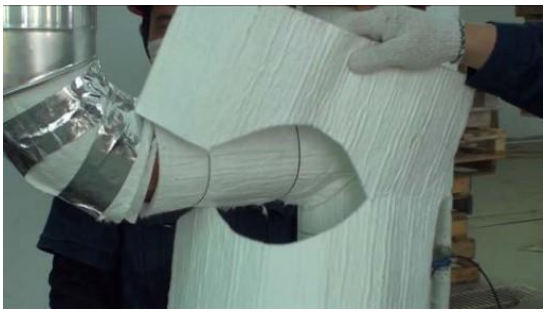
1) *Wrap the pipes with* **REFIAL®-AEROMAT** *blankets , in order to calculate the perimeter needed for insulation in each layer; Trim the* **REFIAL®-AEROMAT** *blankets into different specified slices upon request, based on different pipe sizes.*

TIPS ：3-10CM extra in perimeter should be reserved for overlapping.



2) *Insulate the T-link with* **REFIAL®-AEROMAT** *blankets, then fix with iron belts / galvanized iron tire fasten.*

3) *Make sure the top and bottom layer in staggered position while two or more layers insulation needed. Then fix with iron belts / galvanized iron tire fasten.*



4) *Protective metal framework installed.*

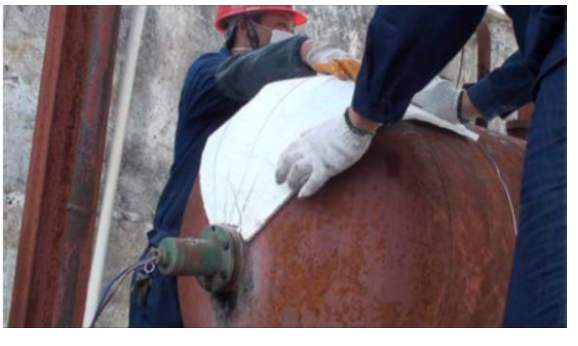
Installation Steps of Tank Head and Tanks:

Tank Head

1) *Measure the distance from the tangent line to the center of the tank head;*
2) *Measure the surface perimeter of the tank body surface, in order to calculate the* **REFIAL®-AEROMAT** *blankets amount needed for insulation installed from the tangent line of the tank;*
3) *Calculate the amount of the blankets, the perimeter of the uniform tangent , then fix the width needed for blanket slices installed on the tangent line.*

TIPS: An extra 10-30cm should be reserved in the tangent line of each aerogel blanket slice.

4) *Cut the* **REFIAL®-AEROMAT** *blankets into different slice needed based on the calculated sizes.*
5) *Fix each blanket slice fasten in the center of the tank head with galvanized iron tire / steel belts, then tiles the blanket slice to the tangent line, and fix accordingly the same.*



TIPS: Sealing the voids between each slice of **REFIAL®-AEROMAT** *blanket with tapes.*

6) *Trim the* **REFIAL®-AEROMAT** *blanket slice into the exact shape of the tank on the tangent line.*

7) *If two or more* **REFIAL®-AEROMAT** *blankets layers to be needed , please make sure tile the different layers staggered, then fix tight with galvanized iron tire.*

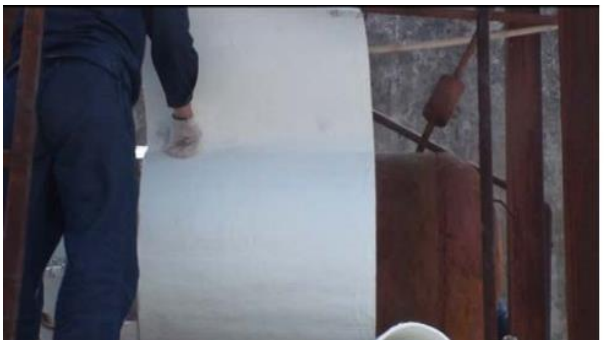



Finally install the Protective metal framework.

Tank Body :

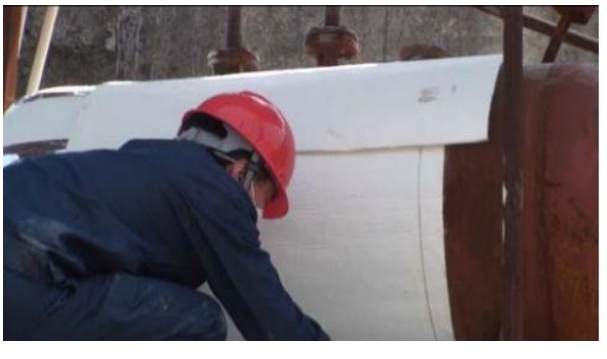
1) *Measure the surface area of insulation needed. Calculate the perimeter of the tank body after insulation on tank surface.*
2) *Trim the* **REFIAL®-AEROMAT** *blankets based on the measured area. Continuous covering layer by layer will be suggested for small tanks, while trimmed* **REFIAL®-AEROMAT** *blankets will be needed for larger tanks.*
3) *Fasten the starting parts of* **REFIAL®-AEROMAT** *blankets with appropriate tools, and wrap the tanks.*
4) *Combining the starting and ending parts of* **REFIAL®-AEROMAT** *blankets, fix tightly with galvanized iron tires / steel belts.*

TIPS: **REFIAL®-AEROMAT** *blankets can be trimmed upon necessary.*




5) **REFIAL®-AEROMAT** *blankets should be cut if encountering bulge, and then wrap the whole bulge with its shape at appropriate position.*

6) *If two or more* **REFIAL®-AEROMAT** *blankets layers to be needed , please make sure tile the different layers staggered, then fix tight with galvanized iron tire.*



7) *Finally install the Protective metal framework.*

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