# ARYANA PARS Co.
## Glass Wool Manufacturing

## Main Features

Aryana Pars Co. is one of the biggest glass wool manufacturers in the Middle East with a production capacity of 12000 tons per year. The company was founded in 2003 with association of Sanat -o- Madan Professional Bank ( Iranian Bank of Industry & Mine ) . The technology and the main process equipment are supplied by well-quaified (German and West European) companies. The product meets the requirements of DIN EN – 13161-162.

The most modern technology used in the factory ensures most updated operational bases and raw materials are so accurately formulated that the product does not cause any slightest harm to human.The process as well is quite environment friendly.

Aryana Pars Co. offers a wide range of products regarding their thickness, density and facing and meets all customers' expectations for thermal and sound insulation in residential or apartment buildings, prefabricated buildings, poultries and animal husbandries, sports halls, oil / gas / petrochemical plants, industrial equipment and machineries.

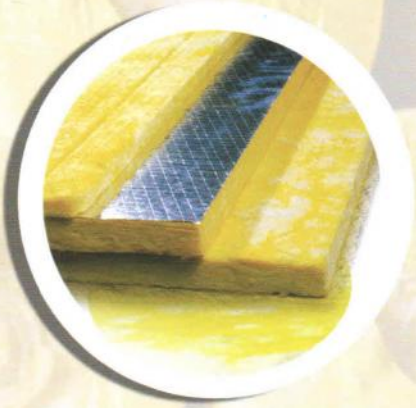
## Production Process

A mixture of raw materials (same as the ones for glassmaking) including Sand , Dolomite, Feldspar, Soda Ash, etc is melt in a high temperature furnace . The continuous glass flow leaving the furnace is drawn into very thin fibers (about 5 microns) within a heated centrifuge counterflow and compressed air. To avoid scattering of the fibers and to improve their forming, some thermoset resin binder is sprayed on glass wool.
Inspite of common people belief, any slightest amount of harmful materials like asbestos is not used in production of glass wool.

Glass wool layer then enters a hardening furnace where the sprayed-on resin polymerizes and condenses to designate the thickness of the layer ranging from 10mm to 250mm depending on the controlled pass speed.
While passing through the curing oven, pressure can increase the density of glass wool and also its mechanical strength. However this procedure is preferably used for production of slabs rather than rolls which differ in statics .
By increasing the pressure during polymerization, the density and mechanical strength of glass wool increases so that density of 100 or 115 kg/m3 becomes so rigid which appears like wooden panels.

## NO Asbestos in Glass Wool

# Various types



## Various types

**All types of our glass wool rolls and panels can be supplied with or without facing.**

**Range of Products and their Application**

| Products | Application | nominal density (kg/m3) | thermal conductivity coef. at 25°C (mean temp.) | performance Temp. (°C ) | standard thickness(mm) |
|---|---|---|---|---|---|
| Roll / Blanket | metallic sloped roofs internal walls | 10-24 | 0.045- 0.036 | 0-230 | 25-250 |
| Slab / Board | inside/outside the buildings prefabricated walls | 24-48 | 0.036- 0.031 | 0-230 | 20-100 |
| | under the flat /sloped roofs walls | 36 | 0.033 | 0-230 | 20-100 |
| | floating floors (rooms /saloons/ floors) | 80-120 | 0.036 - 0.031 | 0-230 | 10-100 |
| | Boilers/ ovens/ industrial equip./ storage tanks | 24-120 | 0.036 - 0.031 | 0-490 | 10-100 |

Note: All products can be supplied with facing, i.e. kraft paper and reinforced or plain Al-foil laminated to glass wool by PE.

## Characteristics

Thermal conductivity coefficiency "λ" is an important characteristic of constructional materials. Lower thermal conductivity of insulations turns them into better ones, so the smaller the λ, the better the insulation.
Heat transfer through glass wool is extremely low and depends on its density, one of the most important factors in an insulation is its thermal resistance which is defined by "R" with a dimension of $\frac{m^2.k}{w}$ in metric system , where "M" stands for meter , "K" for degree Kelvin & "W" for Watt.
So the bigger the R, the better the insulation.

Thermal conductivity coefficiency of glass wool " λ " In ( $\frac{w}{mk}$ ) at various temperature and density

| mean Temp. (°C) | density (kg/m3) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 12 | 16 | 20 | 24 | 32 | 36 | 42 | 48 | 60 | 80 | 90 | 100 | **110** | 115 | 120 |
| 0 | 0.039 | 0.037 | 0.035 | 0.033 | 0.032 | 0.031 | 0.030 | 0.030 | 0.029 | 0.031 | 0.032 | 0.032 | 0.032 | **0.032** | 0.032 | 0.032 |
| 10 | 0.042 | 0.040 | 0.038 | 0.035 | 0.033 | 0.032 | 0.032 | 0.031 | 0.030 | 0.032 | 0.033 | 0.033 | 0.033 | **0.033** | 0.033 | 0.033 |
| 25 | 0.045 | 0.042 | 0.040 | 0.037 | 0.036 | 0.034 | 0.033 | 0.032 | 0.031 | 0.033 | 0.036 | 0.036 | 0.036 | **0.036** | 0.036 | 0.036 |
| 50 | 0.057 | 0.050 | 0.046 | 0.043 | 0.041 | 0.039 | 0.038 | 0.037 | 0.036 | 0.037 | 0.038 | 0.038 | 0.038 | **0.038** | 0.038 | 0.038 |
| 75 | 0.065 | 0.060 | 0.052 | 0.047 | 0.044 | 0.042 | 0.040 | 0.039 | 0.038 | 0.039 | 0.041 | 0.041 | 0.041 | **0.041** | 0.041 | 0.041 |
| 100 | 0.075 | 0.066 | 0.058 | 0.052 | 0.048 | 0.046 | 0.045 | 0.043 | 0.042 | 0.043 | 0.044 | 0.044 | 0.044 | **0.044** | 0.044 | 0.044 |

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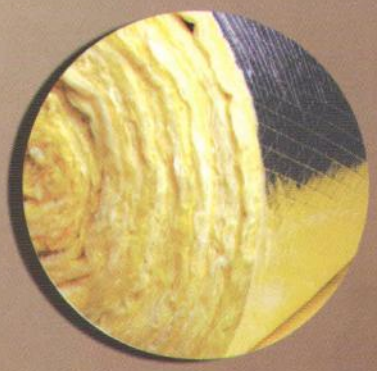
# Application in buildings



Thermal resistance of glass wool "R value" in $(\frac{m^2.k}{w})$ at 25°C various thickness and density

| thickness (mm) | density (kg/m3) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 12 | 16 | 20 | 24 | 32 | 36 | 42 | 48 | 60 | 80 | 90 | 100 | 110 | 115 | 120 |
| 15 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 0.454 | 0.417 | 0.417 | 0.417 | 0.417 | 0.417 | 0.417 |
| 20 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 0.645 | 0.606 | 0.555 | 0.555 | 0.555 | 0.555 | 0.555 | 0.555 |
| 25 | 0.555 | 0.595 | 0.625 | 0.675 | 0.694 | 0.735 | 0.757 | 0.781 | 0.806 | 0.757 | 0.694 | 0.694 | 0.694 | 0.694 | 0.694 | 0.694 |
| 50 | 1.111 | 1.190 | 1.250 | 1.351 | 1.388 | 1.470 | 1.515 | 1.562 | 1.613 | 1.515 | 1.389 | 1.389 | 1.389 | 1.389 | 1.389 | 1.389 |
| 75 | 1.667 | 1.786 | 1.875 | 2.027 | 2.083 | 2.206 | 2.273 | 2.344 | 2.419 | 2.273 | 2.083 | 2.083 | 2.083 | 2.083 | 2.083 | 2.083 |
| 100 | 2.222 | 2.381 | 2.500 | 2.703 | 2.777 | 2.941 | 3.030 | 3.125 | 3.226 | 3.030 | 2.777 | 2.777 | 2.777 | 2.777 | 2.777 | 2.777 |
| 125 | 2.777 | 2.976 | 3.125 | 3.378 | 3.472 | 3.676 | 3.788 | 3.906 | 4.032 | 3.788 | 3.422 | 3.422 | 3.422 | 3.422 | 3.422 | 3.422 |
| 150 | 3.333 | 3.571 | 3.750 | 4.054 | 4.167 | 4.412 | 4.545 | 4.687 | 4.838 | 4.545 | 4.167 | 4.167 | 4.167 | 4.167 | 4.167 | 4.167 |

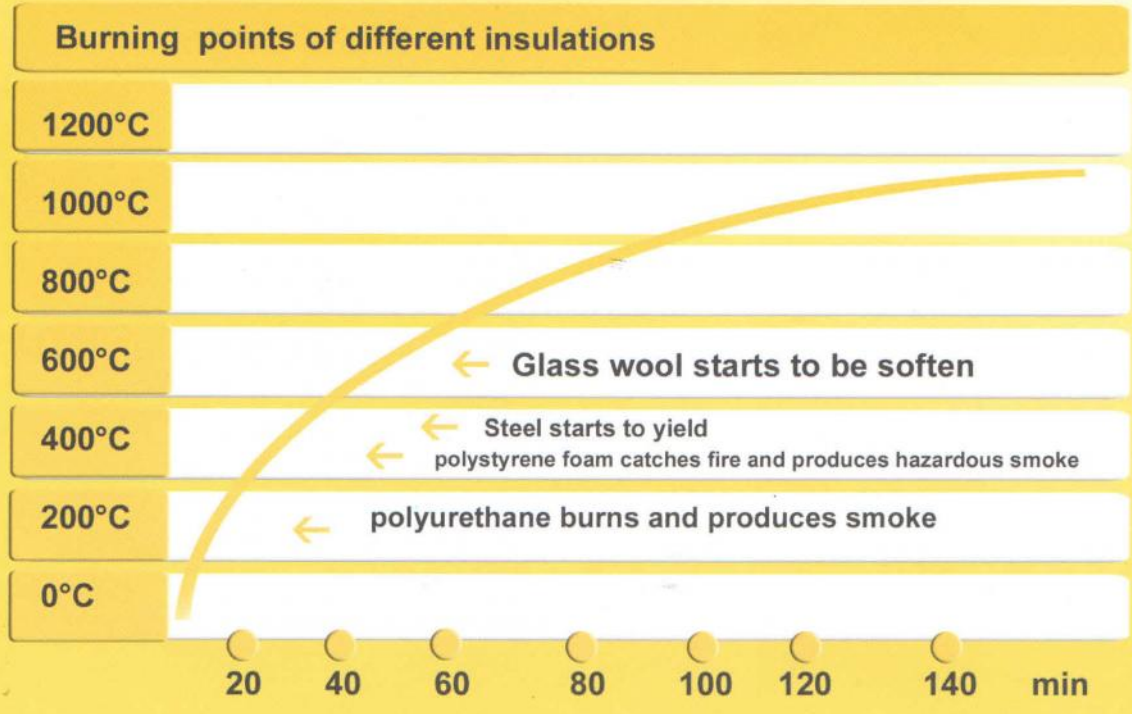
Thermal resistance (R) is directly proportional to thickness (T), but inversely proportional to thermal conductivity coefficieny (λ). $R = T / \lambda$
Thermal resistance is a comparison base for different constructional materials. The "R" value for a 10cm thick glass wool is "2" which is equal to a 2m thick brick wall & a 3m thick concrete wall. Such value turns glass wool to the best insulation for buildings .

## Application in Industry

In high temperature , Glass Wool products do not have much changes in dimensions, and as a type of mineral wool can be used in temperatures up to 500°c. A slight destruction might occur on a thin layer of resin contents in temperatures above 250°c but does not have any effects on mechanical & thermal resistance of the products. This makes glass wool products a proper insulation for industries.

### Other Features

Like other mineral wools, Glass Wool is non-combustible and is well known as a thermal insulation, but it works like a sound insulation as well due to its proper structure; also it can be used instead of acoustic panels. Glass Wool fire resistance distinguishes it from other insulations such as other natural wools and Chemical / Polymeric ones.




Glass wool is made of mineral sand therefore it is a barrier against fire

## Energy Saving

Nowadays, there are increasing demands for energy which plays an important role in development of societies. However, most of the energy resources are irreversible and very valuable.

Figure 1 shows energy loss in a household building and figures 2 & 3 show glass wool used for insulating roof and walls .


Fig 1

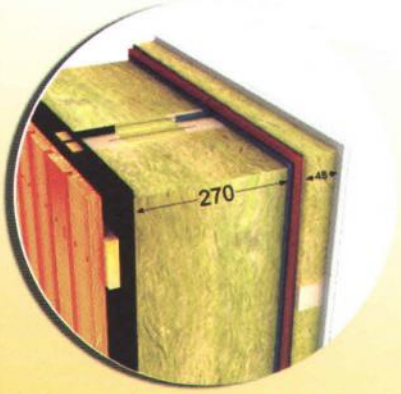
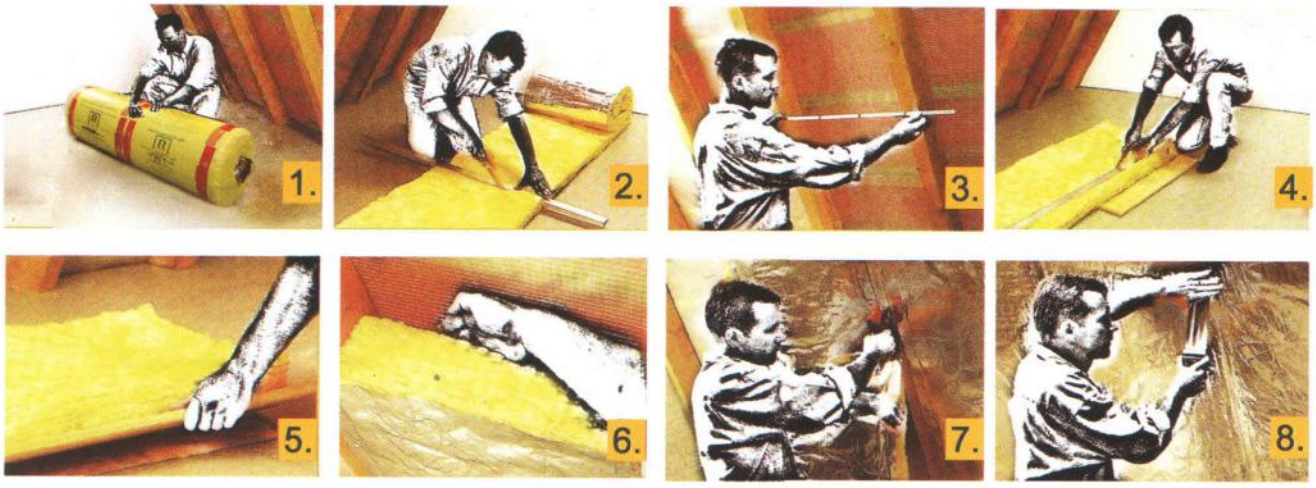



Fig 2

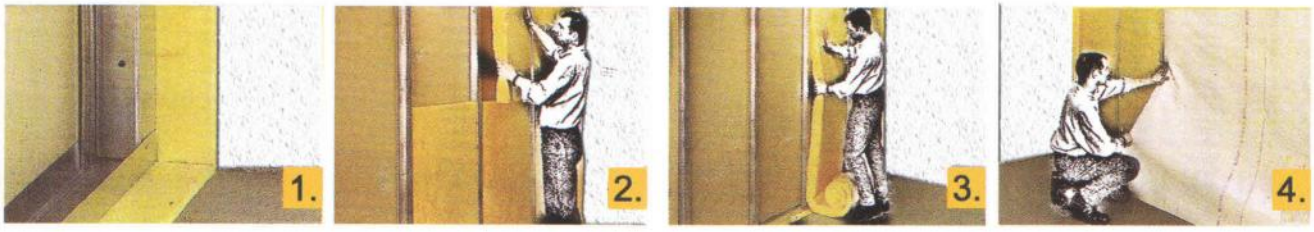
Fig 3

## Installation

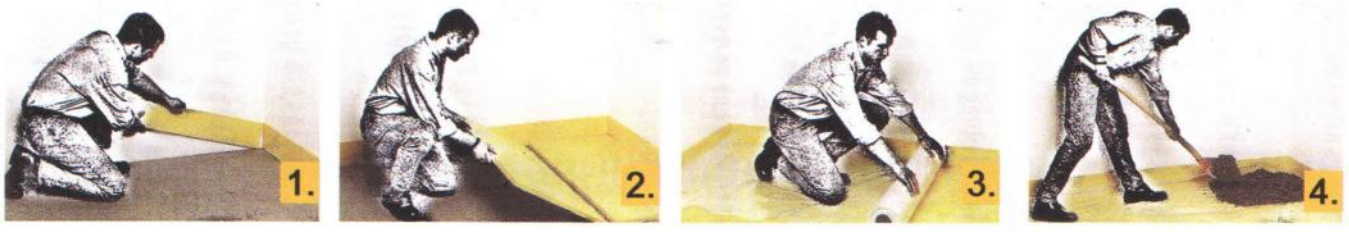
Below you can review methods of insulating a bulding which would be done simply by your own .




Process for installing **Glass wool insulation** under the roof of a building




Process for installing **Glass wool insulation** in the walls of a building built




Process for installing **Glass wool insulation** on the floor of a building built

## Green life

Too much money & enormous amount of energy waste each year , enviroment is contaminated and our globe is getting warmer simply because our buildings are not as energy efficent as they could be .
By using proper amount of Aryana Pars glass wool insulation we can significantly save the energy . Investing in efficiency of buildings will pay for itself through lower energy bills . Insulating our buildings will make a green life for generation to come .

## Safety

Constructional material should not cause the least harm to human either during construction or during operation.
According to the International Agency of Research on Cancer (as a division of WHO), glass wool is graded in the same category as tea or caffeine, therefore there is no risk of cancer as far as glass wool concerns.
Sufficient dust collection systems reduce the emission of fibers. Simple safety tools also can be used to protect skin, eyes, nose and mouth in contact with the particles, although there have been no reports on any respiratory diseases or other problems as far as glass wool is concerned.

# ARYANA PARS CO.

*Glass Wool Mfg.*

saving energy , saving planet