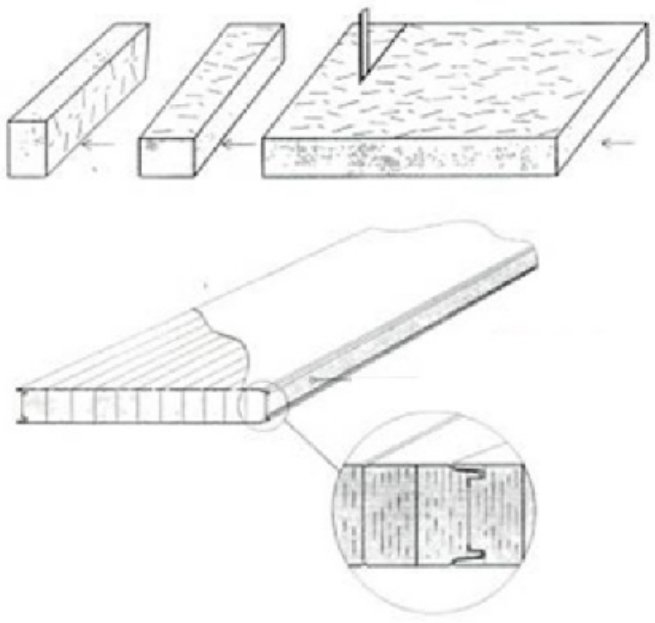
Rockwool

It is a type of mineral wool obtained from the mixture of rocks such as basalt, diabase, dolomite, etc. Generating excellent results in fire resistance and sound insulation, rockwool has lower values in thermal insulation compared to plastic foams. The rockwool-filled sandwich panels are used for the coating of roof, wall or interim section of the buildings with high risk of fire. What is required from the insulation material is not to be directly affected by water. Furthermore, the thermal transmittance value must not increase by getting indirectly wet by means of capillarity. In fact, the fibers within the rockwool do not get wet; however the air gaps between fibers are filled in case of contact with water and the wet rockwool becomes unable to perform its insulation duty. The open pored (glasswool, rockwool, acoustic sponge, etc...) materials are used for the insulation of the airborne sounds. The sound absorbing materials have pores or fiber and they become effective by means of transforming a part of the acoustic energy into heat energy by causing frictional loss through the air penetrating holes in their structure. The rockwool-filled sandwich panels are better when compared to the other panels in terms of its feature of contributing in the sound insulation. On the other hand, in cases when high acoustic performance is required, high transmission values must not be expected from rockwool panel and rockwool with a lower density must be used. Rockwool Specifications TS|12|11 2 As a result of their internal structures, the rockwool plates have lower strength values latitudinally than longitudinally. Although this, its non-flammable feature has enabled various studies to be conducted for improving their low mechanical values. As a simple method; the rockwool plates are divided into lamellas; in other words, they are cut line by line at requested thicknesses. These lamellas are combined by using adhesives as to form a panel. Therefore, while the mechanical values are improved to an extent, panels with high fire resistance are obtained.



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The mineral wools are ultimately stabilized materials since their fibers and also fixing agents do not lose their specifications for long time. The temperature has rare impact on the mechanical specifications of the material. The strength increases with the density, however it depends more on the internal structure. The compression strength is between 0.005-0.08 N/mm² for the limits of 60- 150 kg/m³. The tensile strength is low and it is 0.001-0.01 N/mm². The strength is higher in the direction of fibers. The sliding strength is between 0.03 to 0.20 N/mm² and may vary according to the direction of the fibers. In the buildings constituting importance in terms of fire resistance, the rockwool plates formed of inorganic fibers can be used as sandwich panel core material. The resistance shown by the material against fire, which is explained above with its flammability capacity, is called fire performance. The fire resistance tests are conducted through modeling the wall and roof lines, where the fire spreads the most in the building, in small scales. The materials have been classified according to fire, in six different ways starting from A1 to F. The other classes of the material can be determined according to the smoke and dripping amounts after the fire. The best performance for fire-resistant wall, roof or interior partition wall applications is yielded by the rockwool-filled sandwich panels. Fire strength of the rockwool-filled sandwich panel may vary between 30-120 minutes based on the type, thickness and joint type of the rockwool. The ignition temperature is at the level of 850 °C. The structure of the rockwool is more cellularly more open than the rigid foams. Their open cellular structure makes the rockwool plates more sensitive against the water and vapor diffusion. However, this risk in sandwich panels reduces to the minimum level due to metal surfaces which do not allow the diffusion.

General specifications of Rockwool used in sandwich panel

Density (kg/m³)	100 (± 10)	EN 1602
Thermal Conductivity Coefficient λ (W/mK)	0,033	EN 13162
Vapor Diffusion (μ)	1	EN 12086
Pressure Resistance in the direction of Plate Width (mPa)	min. 0,06	EN 826
Water absorption (by volume %)	3,90	Manufacturer's Method
Temperature Strength (°C)	800	
Sound Insulation Rw (Db)	≤30	

Rockwool Thermal Transmittance Values

Plate Thickness	U Thermal Transmittance (W/m²K)	U Thermal Transmittance (Kcal/m²h C°)
50 mm	0.5855	0.5034
60 mm	0.4973	0.4276
80 mm	0.3821	0.3285
100 mm	0.3103	0.2668

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