HEALTH AND ENVIRONMENTAL PROTECTION

The incorporation of insulation material from mineral wool makes it possible to build healthy and comfortable living spaces as its properties improve the microclimate in a room and, at the same time ensure excellent thermal, sound and fire protection. Products are tested according to Directives 97/69/EC, for which they were granted the »Test Certificate of Bio-solubility«, demonstrating their health safely. Knauf Insulation products ore also ecologically oriented, as they reduce the consumption of thermal energy sources, thereby reducing environmental pollution.
It is also of great importance thai the production procedure of mineral wool is carried out in a closed circuit, i.e. production process waste is recycled in briquette manufacturing and then returned back to the production line.

As part of our policy of continuous product development, we reserve the right to revise specifications without notice. The information given in the brochure is correct to the best of our knowledge. It provides general information only and users should verify whether the products described are suitable for their specific requirements.

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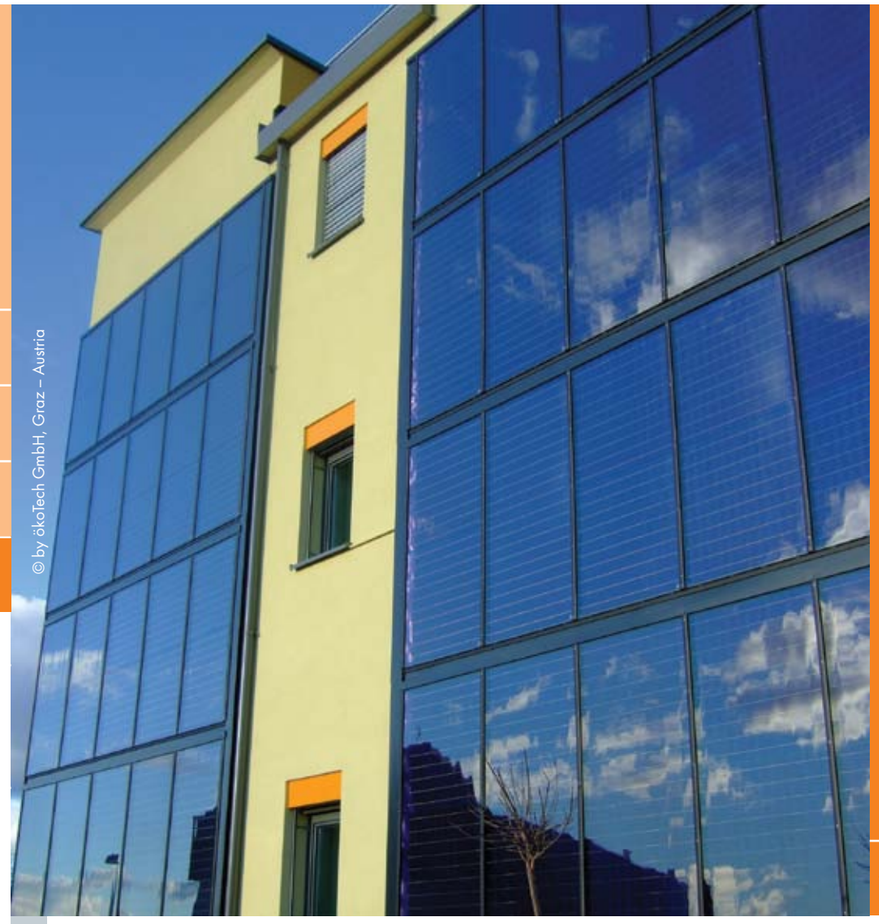

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Black insulation boards for flat thermal solar panels

Thermal Solar Panels Insulation

Thermal Solar Panels Insulation

MAIN PROPERTIES OF ROCK MINERAL WOOL PRODUCTS

- **THERMAL INSULATION PROPERTIES**; thermal conductivity of 0.035 – 0.040 (W/mK)
- **NON-COMBUSTIBILITY -** highest possible Euroclass A1 fire classification according to European standards (melting point above 1,000°C)
- **ENERGY SAVING MATERIAL**, for reduced energy bills and CO_2 emissions
- **HIGHLY SUSTAINABLE**; non-hazardous to personal health and the environment. Rock mineral wool is free from CFCs, HCFCs and any other material with ozone depletion potential in their manufacture and content and represents no known threat to the environment
- **PERMANENTLY STABLE DIMENSIONS**; products do not change in length or width with fluctuations in humidity or temperature
- **RESISTANCE TO MICRO-ORGANISMS**; rock mineral wool is non-hygroscopic, rot proof, does not sustain vermin and will not encourage the growth of fungi, mould or bacteria

KNAUF INSULATION TSP SOLAR BOARD BLK
Black insulation boards for solar panels

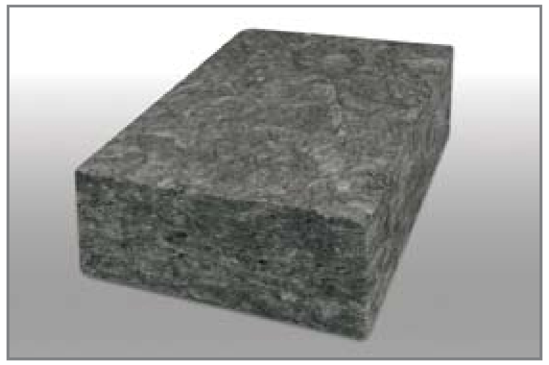
DESCRIPTION

KNAUF INSULATION TSP SOLAR BOARD BLK is a classic rock mineral wool board which is completely **dyed with an inorganic black dyestuff**. The dyestuff has been developed especially for this purpose and shows long-term temperature and UV resistance.

Black coloured boards improve performance at high temperatures, reduce evaporation of organic compounds and improve the overall function of the collector system. It is produced according to a **patented Knauf Insulation Technology**. Technical characteristics (e.g. thermal insulation properties and non-combustibility) are the same as with classic boards. The only difference is the colour.

APPLICATION

Knauf Insulation TSP SOLAR BOARD BLK can be **used as rear and lateral insulation for flat thermal solar collectors**, mounted on roofs, facades or in large-scale collector areas, used for the purpose of space heating or cooling.



PREFERENCES

- Provides excellent thermal insulation thereby minimizing heat loss
- Easy mounting via robotics as the board's upper and lower side are identical
- Special inorganic black dyestuff with long-term resistance
- Better performance at high temperatures regarding evaporation of organic compounds (»fogging«)
- Tested and certified by SPF institute, Rapperswil/CH

Technical properties of knauf insulation TSP SB BLK

Characteristics	Designation	Value								Unit	Standard
Reaction to fire	–	Euroclass A1								–	EN 13501
Melting point	–	> 1000								°C	DIN 4102/T17
Water/vapour resistance factor	m	1.1								–	EN 12086
Specific heat capacity	c_p	840								J/kgK	–
Declared thermal conductivity	λ_d	0.035								W/mK	EN 12667
Thermal conductivity at mean temperature	T_m	50	75	100	125	150	175	200	250	°C	EN 12667
	λ	0.039	0.043	0.048	0.054	0.060	0.066	0.073	0.088	W/mK	

IMPORTANT INFO

ONLINE CHANNEL CUTTING

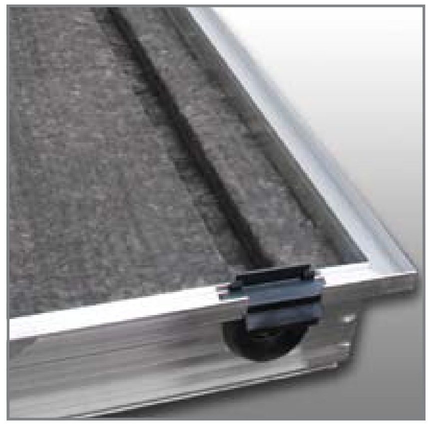
With a newly installed device Knauf Insulation is able to **cut channels into black insulation boards** for thermal solar panels **in an online process**. The thicker collecting tubes of the absorber can enter into these channels.

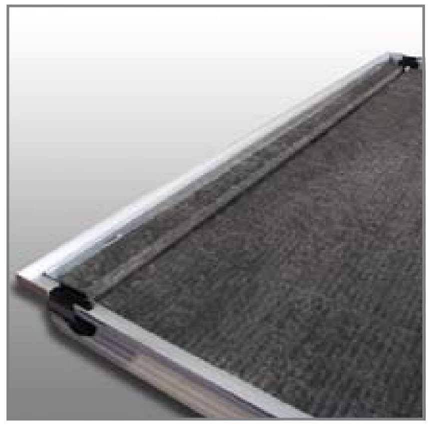
Advantages for thermal solar panels' producers:

- Thickness of insulation board can be reduced and flatter collector design is possible
- Ventilation between absorber and insulation board which can have a negative impact on collector efficiency can be reduced
- Combination of thicker board and thinner stripes in the area of the collecting tube can be replaced by one board with channels

Technical details:

- Distance between channels can be adjusted according to customers requirements, from 1,500 mm to 1,900 mm
- Width and depth of the channels can be customized according to customers wishes



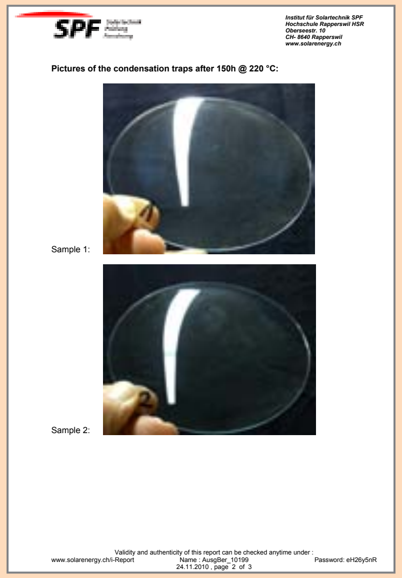


SPF Certificate

Very low binder content and the inorganic dyestuff result in very good fogging properties. **At temperatures up to 220°C virtually no emission of organic compounds can be detected**. This has also been confirmed by a report of the widely recognised SPF Institute in Rapperswil/Switzerland who tested TSP Solar Board BLK at 220°C during a period of 150 hours.

Solar Keymark certificate

Producers of thermal solar panels who want to use Knauf Insulation TSP Solar Board BLK instead of classic faced or unfaced rock mineral wool boards **do not need to apply for a new Solar Keymark certificate** as long as the thickness remains unchanged.



SPF

Institut für Solartechnik SPF
Hochschule Rapperswil HSR
Oberseestr. 10
CH- 8640 Rapperswil
www.solarenergy.ch

Pictures of the condensation traps after 150h @ 220 °C:

Sample 1:

Sample 2:

Validity and authenticity of this report can be checked anytime under :
www.solarenergy.ch/i-Report Name : AusgBer_10199 Password: eH26y5nR
24.11.2010 , page 2 of 3

ADVANTAGES OF BLACK SOLAR BOARDS vs. classic solar boards

- **Less risk of fogging** as both sources of organic emissions – black glass fleece and glue – are eliminated.
- Black solar boards **do not need to be turned** when placed inside the collectors as they are completely dyed.
- **Channels** for collecting tubes can be **cut** into the surface of the board **online**, applying a patented Knauf Insulation technology.
- **Complex insulation** design composed of boards and stripes with high mounting costs can now be **replaced by one board** with cut out channels.

OUR EXPERIENCES

An increasing number of customers all over Europe are already using Knauf Insulation TSP Solar Board BLK as insulation material for their Thermal solar collectors (GR, DE, CZ, AT, ES).