

Protection of folded-plate roofs from the sun for an improvement in air-conditioning efficiency.

Roof Shade for External Heat Insulation of Folded-plate Roofs

Features

- Drops the surface temperatures of folded-plate roofs by approximately 20°C in summer with a reduction in air-conditioning power consumption by up to 23%.
- Applies a new method to install 30-cm-wide sheets designed with consideration to breathability and weather resistance, and ensures the installation of the heat insulator at a low cost, quickly, and with ease.
- The world's only one technology of stainless steel deposition on cover sheets ensures excellent heat shielding, heat insulation, and weather resistance performance.

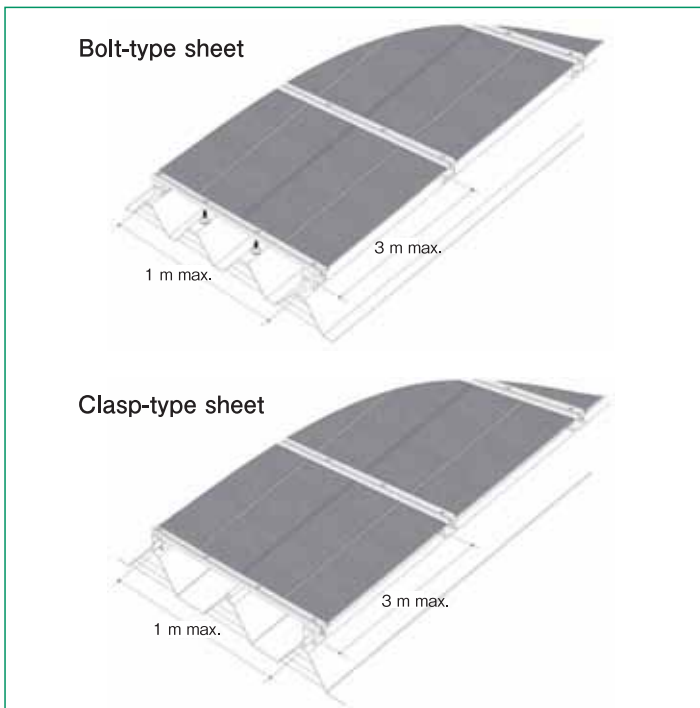
Overview

(Technical principles, actions, etc.)

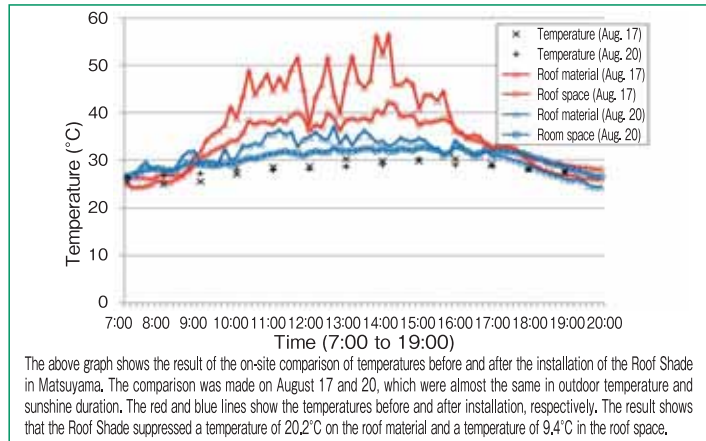
Global warming has been causing temperature rises from year to year recently, and energy-saving measures are worldwide action assignments for all industries. Nihon Widecloth Co., Ltd. has developed an unprecedented external thermal barrier. This product can be installed within a short time without so much initial investment, and is suitable to all types of businesses (e.g., convenience stores, mass merchandisers, restaurants, factories, warehouses, and game arcades). This technology uses sunshades (made of special mesh sheets) to cover folded-plate roofs to drop the surface temperatures of the roofs, thus reducing the power consumption of air conditioners and contributing to a work environment improvement.

Mesh sheets originally used for marine aquaculture (e.g., the farming of deep-sea fish, such as sea bream and flounder) have excellent strength and weather resistance performance with a shading rate as high as 97.84%. These mesh sheets are coated with thin stainless steel with high reflection and heat insulation performance to make the mesh sheets special ones.

Each special sheet is cut to a width of 30 cm for an improvement in breathability for the prevention of temperature rises. Special brackets are used on each roof to lay these special mesh sheets laterally with space provided between the roof and sheets for the protection of strong wind force and ease of installation.



Installation view



Change in Temperature of Roof Space and Roof Material over Time with or without Roof Shade

Introductory Track Record

- Plant (Yamanashi Prefecture) 350m²
- Supermarket (Kagoshima Prefecture) 4,200m²
- Corporate logistics center (Osaka Prefecture) 1,000m²
- Plant (Kyoto Prefecture) 4,800m²
- Tenant (Osaka Prefecture) 300m²
- Noodle shop (Ehime Prefecture) 200m²
- Noodle shop (Saga Prefecture) 200m²
- Corporate office (Aichi Prefecture) 200m²
- Plants (Aichi Prefecture) 500m²

Effects

◎ There are no other products that shade rooftops from the sun. The following effects are expected from an installation example of the Roof Shade on a one-story restaurant with an area of 200 m².

- ① The power consumption of all the 200-V electrical appliances in the restaurant will be 57,879 kWh per year.
- ② The power consumption in April, when the air conditioners will be rarely used, will be 2,315 kWh.
- ③ The power consumption of all the low-voltage equipment other than air conditioners will be 27,780 kWh (2,315 kWh x 12 months).
- ④ The power consumption of the air conditioners per year: ① - ③ = 57,879 kWh - 27,780 kWh = 30,099 kWh
- ⑤ The alleviation rate of the power consumption of the air conditioners is 23%. ④ x 0.23 = 6,922 kWh

From ⑤, a reduction of **6,922 kWh per year** is expected from this example.

<Annual CO₂ reduction>

6,922 kWh (power reduction per year) x 0.555 (factor) = 3,842 kg
 ※ The above calculation was made on the basis of a default value of 0.000555t-CO₂/kWh specified by Environment Decree No. 3 (2006) of the Ministry of Economy, Trade and Industry.

<Reduction of Electric Charges>

A reduction of approximately 180,000 yen for 6,922 kWh saved.
 Initial investment: 200 m² x 5,000 yen/m² = 1,000,000 yen
 Operating costs: None
 Depreciation: 1,000,000 yen ÷ 180,000 yen = 5.55 years
 Reference: Electric bill simulation of Shikoku Electric Power.

※Checked by Nihon Widecloth Co., Ltd.
<http://www.yonden.co.jp/cgi-bin/ryokin/index.cgi>

Applicable field
 Convenience stores, mass merchandisers, restaurants, factories, warehouses, and game arcades / Folded-plate roofs

Water

Energy saving/Energy recovery

ENERGY
 Energy storage/Energy creation

New energy

Waste disposal/Recycling/Resource saving

Air

Soil

Other

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※Note: This publication introduces examples of technologies and products believed useful towards solving environmental and energy issues. In no way does it constitute guarantees concerning their transfer or sale.