

Heat Insulating Foamed Polyethylene Sheet with Sticky Adhesive Layer “FoamAceEco”

1. INTRODUCTION

Metal roofs are used in various architectural structures for their attractive appearance, ease of construction, and economy. But along with the enhanced energy-consciousness in recent years, they are frequently required to have heat-insulating layers such as foamed polyethylene and glass wool so as to provide upgraded performance in terms of thermal insulation and dew condensation prevention.

Furukawa Electric has been supplying to the market-place the products of foamed polyethylene sheet with primer coating. In installing these products, customers carry out by themselves the laminating and forming work onto steel sheet before completing metal roofs in the form of folded-plate roof, crosswise-shingled roof, or lengthwise-shingled roof.

Conventionally, rubber adhesives have been widely used in the laminating work of foamed polyethylene with steel plate, but, from the standpoint of ecology mindedness, we have recently developed FoamAceEco. This product uses a special sticky adhesive coating in place of conventional primer coating on the polyethylene sheet to eliminate the use of adhesives, thus helping customers in reducing the material costs in their working processes. See Figure 1 for comparison of structures between the conventional and developed metal roofs.

2. FEATURES

FoamAceEco is a foamed polyethylene sheet with a special sticky adhesive coating, and its features include the following:

- No adhesive is needed.
- Because no separator is used, it produces no waste at the site.
- It is removable as long as immediately after application, allowing easy reapplication. This eliminates

waste and enables ease of separation from steel sheet, improving recyclability.

- It can be used as a roofing material for temporary fixing as well as for buffering.

3. APPLICATION EXAMPLES

- Crosswise-shingled roof for school gymnasium. See Figure 2.
- Temporary fixing of lengthwise-shingled roof for school building. See Figure 3.
- Crosswise-shingled roof for detached house, guest-house, etc.



Figure 2 Application example of crosswise-shingled roof for school gymnasium.



Figure 3 Application example of temporary fixing for lengthwise-shingled roof.

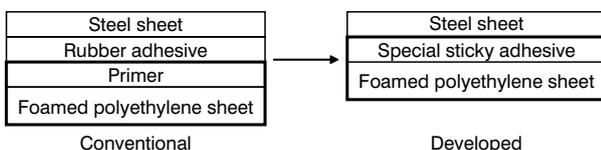


Figure 1 Structure of conventional and developed metal roofs.

4. PROPERTIES

- The adhesion property is stabilized as shown in Figure 4. The peeling strength becomes even higher than the initial value after the heat cycle test of in-house method: Temperature rise in 4 hr \leftrightarrow 80°C \times 8 hr \leftrightarrow Temperature drop in 4 hr \leftrightarrow -20°C \times 8 hr.
- The mechanical strength is equivalent to that of 40-fold expanded foamed polyethylene. See Table 1.

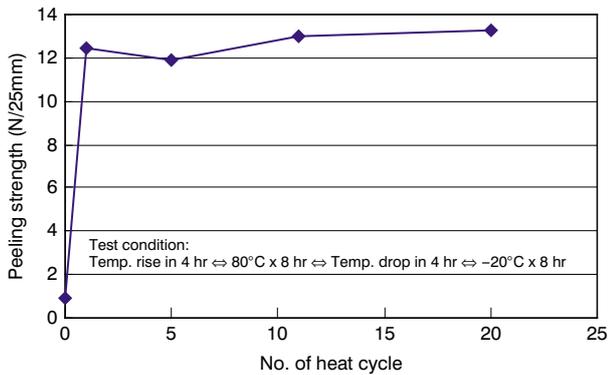


Figure 4 Adhesion strength of FoamAceEco against heat cycles.

Table 1 Physical properties of FoamAceEco.

Test item	Unit	Measured value
Density	kg/m ³	25
Tensile strength	Longitudinal	kPa
	Transversal	kPa
Elongation	Longitudinal	%
	Transversal	%
Tear strength	Longitudinal	N/cm
	Transversal	N/cm
Hardness in compression (25 % strain)	kPa	20
Thermal conductivity (0°C)	mW·m ⁻¹ ·K ⁻¹	31

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