

Fluorocarbon Resin Coated Galvanized Steel Sheet for Exterior, "RESINO WALL"*

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1 Introduction

In recent years, importance has been attached not only to the durability, function and economy, but also to the aesthetics of building exteriors. In particular, fluorocarbon resin coated steel sheet panels have come to the forefront in the market. In July 1967, Kawatetsu Galvanizing Co., Ltd. started the manufacture and marketing of RESINO WALL made by spraying RESINO 20-F fluorocarbon resin for coating steel sheet using a thick-wall, thick-film coater (35- μ m-thick fluorocarbon resin coating on 1.6-mm-thick galvanized steel sheet). In the following paragraphs, an outline of RESINO WALL is given.

2 Outstanding Features of RESINO WALL

For marketing RESINO WALL, an integrated division of responsibility has been created which ranges from the material design to manufacture, application and installation. Outstanding features of RESINO WALL are quality and performance as given below.

(1) Excellent Durability and Weatherability

For the base sheet, a Z27 galvanized sheet, which has a thicker Zn coating weight, is used, thereby giving excellent durability and weather resistance. A baked coating of fluoride vinylidene resin is applied under factory controlled conditions. The composition of the Zn layer and fluorocarbon resin coating are shown in Fig. 1. The minimum coating thickness is 35 μ m.

(2) Fire Resistant and Heat Insulating Specifications

When rock wool is sprayed on the panel surface, fire resistance continues for 30 min with a thickness of 20 mm and 60 min with a thickness of 30 mm. When the panel is bonded with fire-resistant board, the panel has fire resistance for 30 min with a board 20 mm in thickness and for 60 min with a 35-mm-thick board.

With the use of vermiculite spray and an expandable polyethylene board, the panel can be used as a condensation-proof and heat-insulating panel.

(3) Panel Shapes and Dimensions

Panels of all shapes are available. For colors, four standard colors and a variety of colors which meeting the style requirements of designers are available.

(4) Economy

RESINO WALL panels are lower in cost than aluminum panels.

(5) Lightweight Building

RESINO WALL panels permit the construction of a light-weight building. Since the panel weighs only 15 kgf/m² per sheet and is lighter than tile or PC boards, it has a distinct advantage in structural design.

(6) Convenience in Remodeling

Not only for new construction but also for remodeling, RESINO WALL panel does not require the

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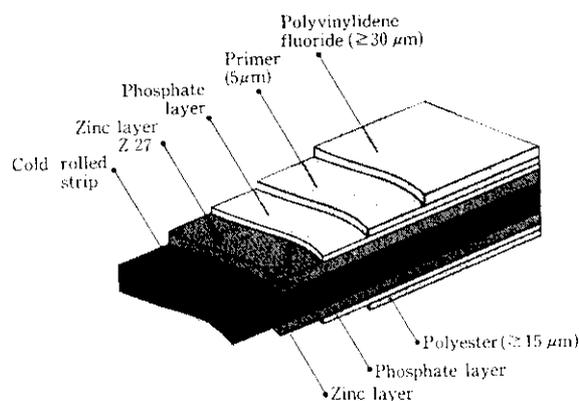


Fig. 1 Schematic diagram of RESINO WALL base sheet

removal of existing tiles and mortar. Instead, RESINO WALL panels can be installed simply by clamping the base sheet directly with anchor bolts, thus reducing the installation period.

3 Types and Specifications of Products

Prepainted panel with the specification of RESINO 20-F thick film constitutes the main product. At portions where welding is in dispensable for installation, a postcoated panel using galvanized sheet Z-27 (the panel given fluorocarbon bake-coating after working and forming) is available. Postcoated products have the same specifications with respect to durability and weather resistance as prepainted products. Specifications of prepainted and postcoated products are shown in Fig. 2; and the manufacturing processes are shown in Fig. 3.

4 Coated Film Performance

In coating RESINO WALL panel, a top coat of $30\ \mu\text{m}$ in thickness consisting of fluoride vinylidene resin is applied over an epoxy resin primer of $5\ \mu\text{m}$ in thickness. The outstanding feature of the film for RESINO WALL coating exists in its excellent durability and weather resistance as well as good expandability during working, as explained below.

(1) Durability and Weather Resistance

This coating material has been marketed since 1981 as RESINO 20-F for construction of roofs and outer walls, and its durability and weather resistance have been adequately proven in actual buildings.

(2) Expandability

This coating material shows excellent expandability, and at the time of sheet working, the coated film shows little susceptibility to cracking. In addition,

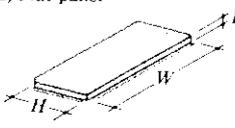
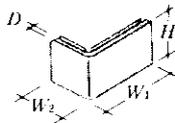
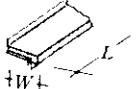
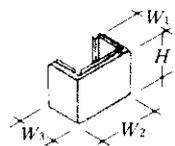
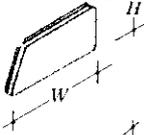
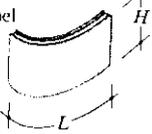
Prepainted panel		Postcoated panel	
Form	Size (mm)	Form	Size (mm)
1) Flat panel 	$W = 200 \sim 4\ 000$ $H = 200 \sim 1\ 100$ ($D = 30$)	1) Coping panel 	$L = 200 \sim 4\ 000$ W : Optional
2) Corner panel 	$W_1 \leq 4\ 000 \sim W_2$ $W_2 \leq 200$ $H = 200 \sim 1\ 100$ ($D \leq 30$)	2) Flashing panel 	$L = 200 \sim 4\ 000$ W : Optional
3) Pilaster type panel 	$W_1 \leq 4\ 000 \sim W_2 + W_3$ $W_2 \leq 200$ $W_3 \leq 200$ $H = 200 \sim 1\ 100$	3) Corner coping panel 	Optional
		4) Nonsquare flat panel 	$W = 200 \sim 4\ 000$ $H = 200 \sim 1\ 100$
		5) R panel 	$L = 200 \sim 4\ 000$ $H = 200 \sim 1\ 100$

Fig. 2 Specifications of prepainted and postcoated panels

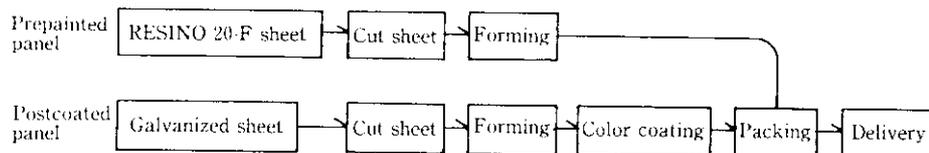


Fig. 3 Manufacturing process

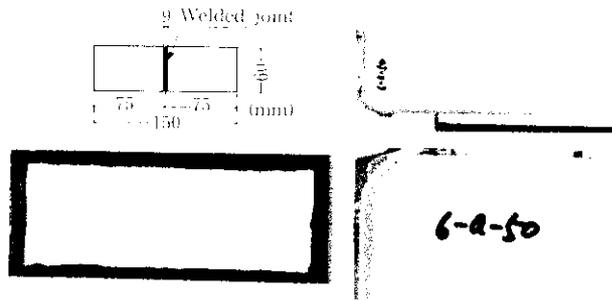


Photo 1 Surface appearance of salt spray test (SST)

RESINO WALL panel is given larger values such as 8R and 10R for the bending radii of the bender and press workings respectively, thus providing full assurance against cracking. Results of a corrosion resistance test of the weld zone of the postcoated product and worked portion at four corners of the prepainted product using salt-water spraying test (SST) are shown in **Photo 1**. Even after 2 000 h, both types of products showed no occurrence of white rust or blisters.

5 Examples

An example of a RESINO WALL structure is shown in **Photo 2**. The existing building was three story RC

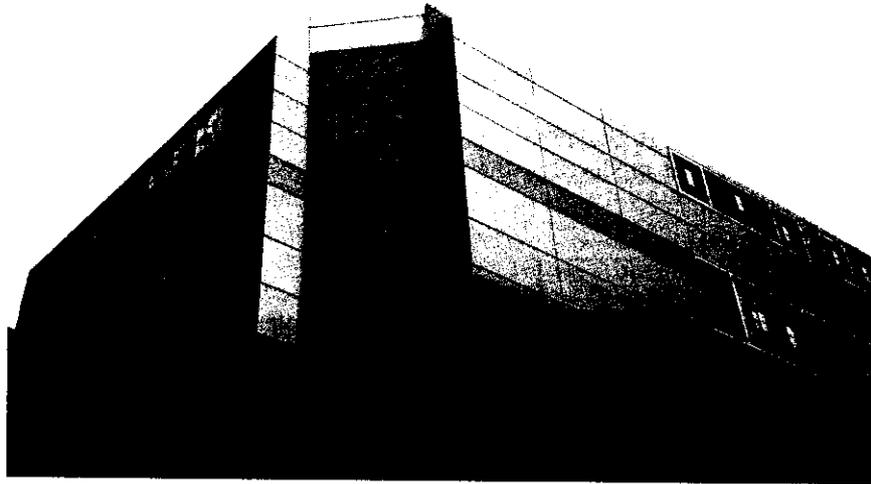


Photo 2 Exterior of building using RESINO WALL

construction, and its exterior was finished with tile. In the refurbishing work, the building was enlarged into a six-story steel structure, and as the exterior facing, RESINO WALL panels were used, with the following advantages: (1) excellent durability and weather resistance, (2) ability to cope with relative displacement, (3) ability to obtain colors suitable for the designer's requirements, and (4) moderate cost compared with aluminum panels.

6 Concluding Remarks

RESINO WALL is a fluorocarbon resin coated galvanized steel sheet which has excellent features and characteristics such as economy, durability and aesthetic appearance. The authors are confident that RESINO WALL will fully satisfy the needs of users in a wide field centering around the exterior facing of intermediate-scale buildings.

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