

THE METHOD OF REPAIRING HOT-DIP GALVANIZING BY THE COLD GALVANIZING COMPOUND

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1. INTRODUCTION

Hot-dip galvanizing has high anti-corrosion performance, and has been widely used for rust prevention on steel.

Because this process requires the use of large equipment, it is not practical for small applications such as touch-ups or repairs of damages done by cutting or welding.

In addition, in the galvanizing facility, some repair is necessary for non-plated parts or parts exposed to excessive scraping. (Fig.1)

Using the improper paint for repairs causes peeling and early rusting..

This article describes the cold galvanizing compound ROVAL, which has equivalent anti-corrosion performance to hot-dip galvanizing. (Fig.2)



Fig.1 scraping



Fig.2 The cold galvanizing compound ROVAL

ROVAL Corporation was founded in 1955 in Osaka, Japan.

In 2003, we also established the Shanghai factory in China.

Our company shares the same unique name for its product and company name.

As a specialized manufacturer of zinc rich paint for over 60 years, we have responded to the various needs of our customers.

2. THE PROBLEM OF HOT-DIP GALVANIZING REPAIR PAINT

What kind of paint should you use to repair hot-dip galvanizing?

Sometimes I see the use of normal silver paint.

It might look sufficient, however, it only succeeds in hiding the real problem.

Normal silver paint is not suitable for such repairs because it does not provide a strong enough protective coat.

Fig.3 shows only the welding has rusted. Why do you think that is?

It's because anti-corrosion effects can not be expected with normal silver paint alone.



Fig.3 Only welds are rusted



Fig.4 Peeling paint

How about painting a conventional anti-corrosion paint and applying a top coat?

Certainly anti-corrosion effects can be expected.

However, painting on hot-dip galvanizing will peel in a few years if you do not choose the right paint. (Fig.4)

It is also troublesome to use two types of paints.

3. THE COLD GALVANIZING COMPOUND : ROVAL

ROVAL contains 96% pure zinc powder in its dry film.

Do you know zinc rich paint?

Zinc-rich paint is a paint that contains a large amount of zinc powder.

I'm sure you know, metal zinc rusts more easily than iron.

By using this property, keeping the iron and zinc in close contact, only the zinc side will rust and not the iron.

We succeeded in raising the dry film zinc content to 96% by mixing a large amount of zinc powder into a special resin.

Our competitors usually use around 70 to 80% zinc in their products, but we use a staggering 96%.

Fig.5 is a cross-sectional photograph of the coating film magnified 1000 times.

The spheres you see are zinc powder.

Most of the coating film is occupied by zinc powder.

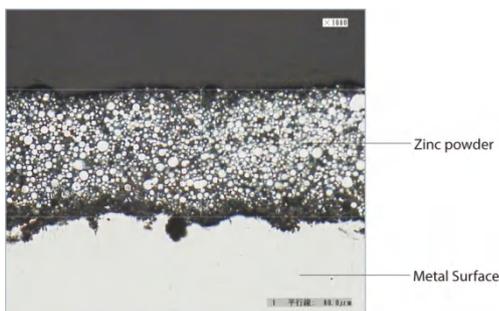


Fig.5 Cross-sectional photograph of the ROVAL coating film (x1000)

ROVAL is a paint that can make the most of the anti-corrosion ability of zinc. As it's prepackaged in single packs, it doesn't require mixing, or the additional use of a primer or top coat. It's easy to use and can be applied directly to steel and galvanized surfaces. ROVAL can be used not only for touch-ups of cut surfaces, welds and non-plated parts, but also for large steel structures and parts that are difficult to be hot-dip galvanized. ROVAL can be applied directly to old or thin galvanized surfaces to prolong the anti-corrosion effect, without the need for additional re-galvanization. ROVAL combines the ease of painting with the excellent corrosion resistance of hot-dip galvanizing. Since ROVAL is simply applied in standard temperatures, it is called "Cold galvanizing compound"

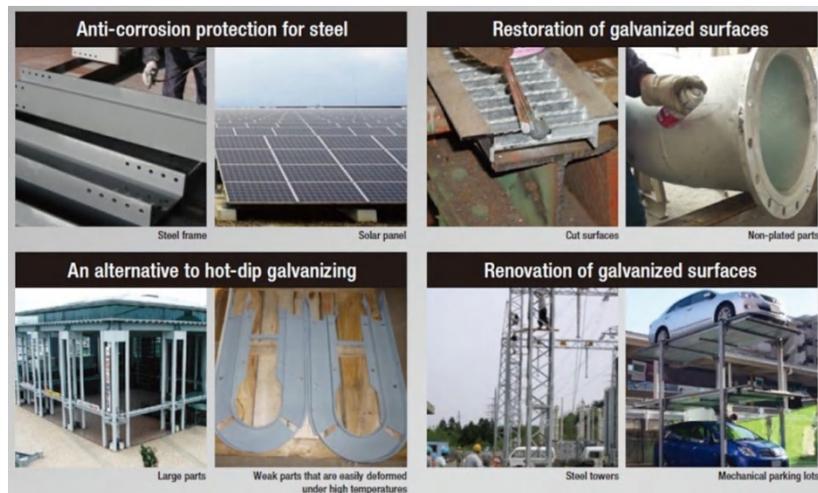


Fig.6 Applications

4. HOW TO USE

ROVAL is an easy-to-handle, single liquid type compound. It does not require any mixing and has no limitation of pot life. The rest of the paint can be kept in a closed container. Like other conventional paints, it can be applied with a brush or a roller, as a conventional spray, or an air-less spray. An aerosol version is also available.



Fig 7. Application Methods

The most important factor in the application of ROVAL is to apply it DIRECTLY to the steel or galvanized surface.

Do not use a primer or apply ROVAL to rusted or painted surfaces.

Three other important factors in the application of ROVAL are: proper surface preparation, adequate agitation, and sufficient film thickness.

1. "Proper surface preparation"

When applying ROVAL on galvanized surfaces, use a hand tool to remove white rust.

For steel surfaces, remove all the rust and mill scale by sandblasting or using a power tool to expose the clean steel surface.

2. Adequate agitation

Because ROVAL contains a lot of powdered zinc, the contents may settle at the bottom of the can. Use a power paint mixer to obtain uniform viscosity.

ROVAL's viscosity is pre-adjusted. Dilution is not required.

3. Sufficient film thickness

Anti-corrosion performance is directly proportional to dry film thickness.

Do not spread the paint too thin.

Apply 2 coats of ROVAL to obtain a film thickness above 80 micrometers.

Make sure the paint is dry to touch before applying a second coat.

5. THE RESULTS OF COMPARISON TEST

5.1 EXPOSURE TEST

To compare the anticorrosion effect, we conducted exposure tests on Miyakojima Island.

Miyakojima Island is located in the southern area of Japan, at roughly the same latitude as Florida, U.S.A.

The island is surrounded by a lot of deteriorating factors such as high temperature, high humidity, strong sunshine, and a salt-rich atmosphere.

Fig.8 shows the exposure test results.

In such a harsh environment, test pieces of JIS anti-corrosion paint + phthalic topcoat generate rust in one year, and in three years, the rust spreads over the entire surface.

Using Epoxy paint top-coated with a urethane, rust showed up around the cross-cut area.

On the other hand, with ROVAL and hot-dip galvanizing test pieces, no rusting occurred even after 3 years.

Let's take a closer look underneath the paint film.

No rust spread from the cross-cut area under the ROVAL film.

In contrast, the Epoxy paint shows rust spreading from the cross-cut area.

JIS anti-corrosion paint shows rust developing in an area other than the cross-cut. From these results, it is apparent that ROVAL protects steel surfaces from the spread of rust whereas other paints allowed it to spread widely.

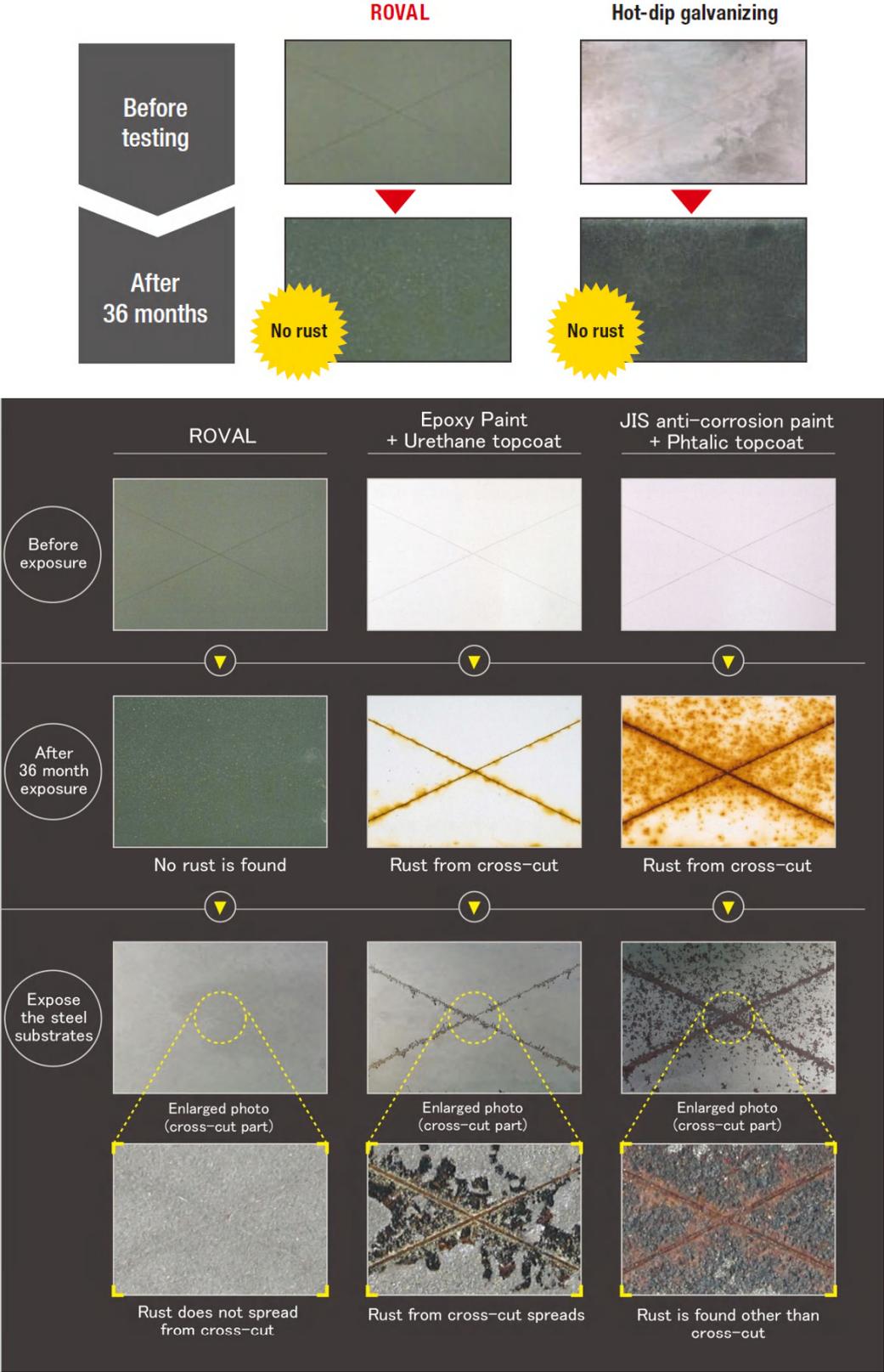


Fig. 8 Exposure test results in Miyakojima Island

5.2 CORROSION ACCELERATING TEST

We also conducted a salt spray test and a cyclic corrosion test to compare ROVAL with hot-dip galvanizing.

Fig.9 shows the test results.

The salt spray test lasted for 2256 hours, and the cyclic corrosion test lasted for 3024 hours. (The cyclic corrosion test was named JIS K5600-7-9 cycle D)

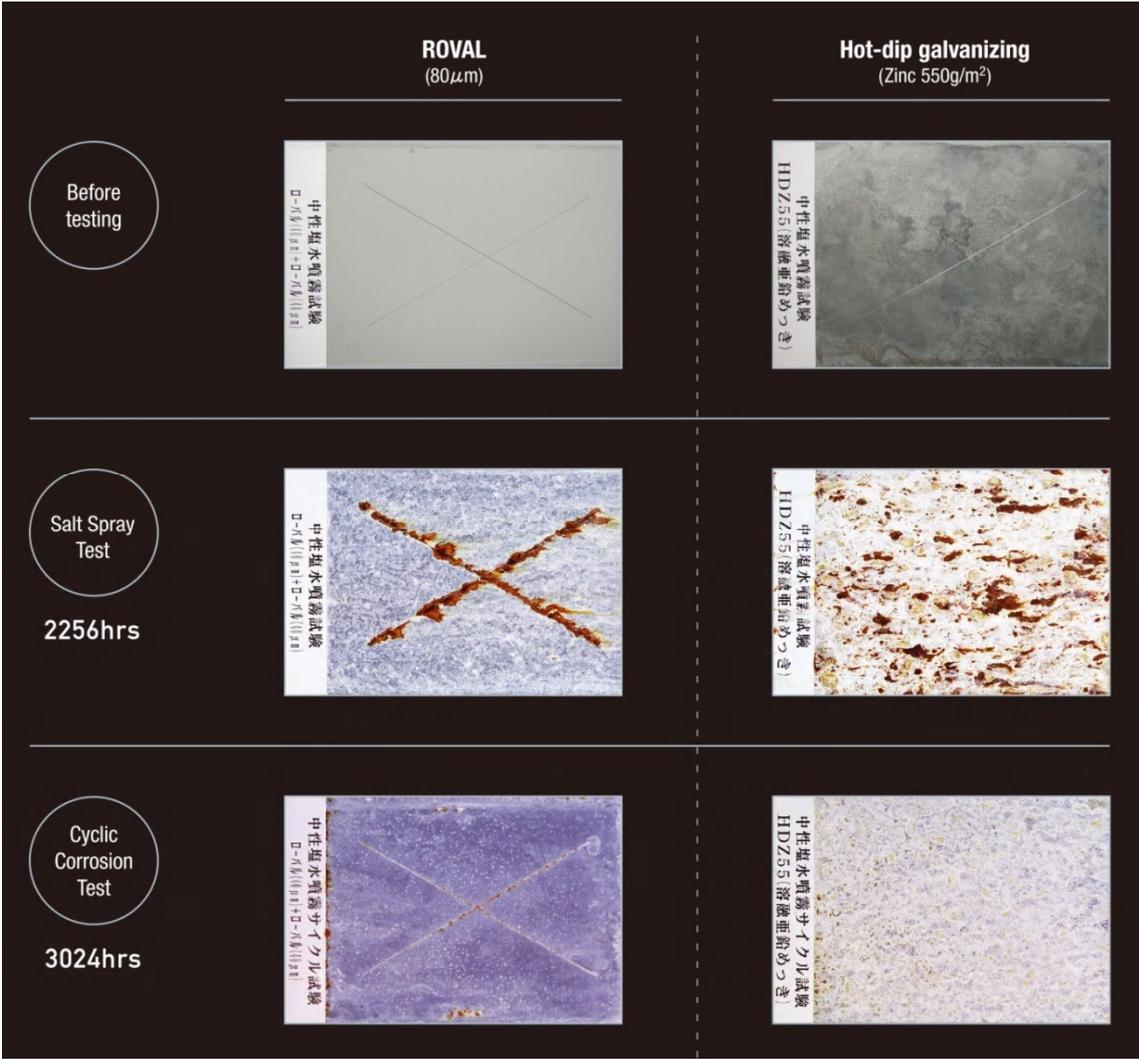


Fig 9. Corrosion accelerating test results

6. CERTIFIED ANTI-CORROSION PERFORMANCE

From these results, ROVAL has been certified to have equivalent anti-corrosion performance as hot-dip galvanizing by the Council for Construction Technology Review and Certification in Japan.

In addition, ROVAL's excellent performance was recognized and certified by the Minister of Land, Infrastructure and Transport.



Fig10. Certificate

7. AQUA ROVAL

While keeping the outstanding anti-corrosion ability of ROVAL as it is, we have launched a water-based version called AQUA ROVAL.

Compared to ROVAL, AQUA ROVAL cuts VOC by 93%, has no thinner odor, and no fire hazards.

You can use it with confidence in shopping centers, train stations and public facilities.

AQUA ROVAL pots are sold with their zinc powder and paint solution packaged separately.

Just before use, stir the paint solution, then add the zinc powder little by little.

After that, stir the mixture well with a power paint mixer until lumps disappear.



Fig.11 AQUA ROVAL

8. CONCLUSION

ROVAL has equivalent anti-corrosion performance to hot-dip galvanizing.

As you can see, ROVAL alone can guarantee long-term maintenance-free performance without the need for a primer or top coat, in an easy application format.

ROVAL is the best paint for hot-dip galvanizing repairs.

Currently, we have distributors in Thailand, Japan, China, Korea, Taiwan and Myanmar.

We are looking for distributors.

If you are interested in becoming a distributor, or if you have any questions in this article, please feel free to contact us from our website, www.roval-group.com.