



## SWARF STAINING OF STEEL ROOFING AND CLADDING

### Introduction

Swarf is the term given to the steel debris arising from cutting or piercing operations when using friction saws, drills etc., on steel roofing and cladding products. The use of abrasive discs is not recommended. Whilst comprising mostly fine steel particles, in this context swarf may also be taken to include any other discarded steel objects such as rivet shanks, nails, screws and nuts, which may come into contact with coated products; i.e: COLORBOND® prepainted steel, ZINCALUME® coated steel and galvanised steel.

Swarf particles, if left on the surface, will corrode and cause rust stains which will detract from the finished appearance of a project. These stains are often mistaken for early deterioration of the roofing and cladding itself.

Prevention of swarf staining is the responsibility of the installer and it is strongly suggested that the recommendations contained in this brochure be followed.

Generally, swarf particles come in contact with coated steel sheet products in three ways:

1. Loose particles left after cutting, drilling and riveting operations.
2. Hot swarf particles from disc cutting or drilling operations which may adhere to the finished surface.
3. Loose particles which may be trodden in or become embedded in the surface film of prepainted products under pressure from adjacent equipment or materials.

### Prevention

#### Cutting

- Power shears or hand snips produce the least amount of debris.
- Power nibblers give a clean cut but generate debris which if left is prone to corrosion.
- Metal friction blades produce fine hot particles which can imbed easily into the coating surface and corrode rapidly.

If there is no alternative but to cut with a friction blade, the sheet should be cut away from the job and any other sheets. Where this is not practical, newly fixed roofing should be masked off with building paper or similar material to allow for the collection and disposal of any swarf particles. The sheet should be cut with the top surface downward to minimise top damage. Hand shears should be used to trim back any ragged edges.

#### Drilling

The area around the hole should be masked to shield the product from hot swarf.

#### Installation

Smooth soled shoes should be worn when working on a roof; avoid the ribbed type which will carry swarf and other objects.

#### Clean up

Swarf should be swept or hosed from the job progressively, and certainly at the end of each day. This action will remove loose particles. Maximum care should be taken when attempting to detach swarf which has become stuck. This can be done, but no action which is likely to remove the paint or metal coatings should be attempted. Any damage to these coatings will lead to reduced life of the material.

When sweeping or hosing into a gutter, clean out the gutter before leaving the job in order to prevent premature corrosion. On completion of the job, give a final wash or sweep down.

For critical applications, inspection of the job should be made after two weeks when rain or condensation will have caused any remaining swarf to rust, and will highlight affected areas. TREAT AS FOR REPAIR.

**Note:** Many swarf staining problems arise not from installers, but from other contractors working in the vicinity. Architects and builders need to be aware of this possibility, and warn contractors accordingly.

### Identification

Fresh swarf stains are characterised by small red-brown coloured areas with a central dark spot (the remains of the steel particles). The surface will feel like sandpaper, and the particle may be lifted with a fingernail.

An old swarf stain will appear as a localised red-brown stain, the steel particle having corroded away, and the surface will be smoother.

### Effect on Performance

The effect of swarf staining itself on COLORBOND® prepainted steel products, is generally aesthetic and may not be detrimental to the performance of the product. The product life will, however, be severely affected where attached swarf particles have penetrated the prefinished film and are in contact with the protective metallic coating, although this only occurs in severe cases. This is because, on prepainted surfaces, red oxides of iron are insoluble in water, and the stain will take considerable time to weather away.

On metallic coatings, concentrated corrosion can occur over a small area as the zinc in the coating sacrifices itself to prevent oxidation of both the swarf and, if allowed to continue, exposed areas of the steel base. Removal of swarf in the first place is far superior to repair of damage.

### Repair

#### *Metallic-Coated Steel Sheet*

Brush the surface with a stiff bristle (not metallic wire) brush to dislodge particles which must then be completely removed, not just swept into the guttering. Wire brushing will mar the appearance of the sheet if brushing is not followed by painting. If the coating is severely damaged by swarf corrosion, the area should be painted.

**STEELWOOL MUST NOT BE USED as it breaks up and becomes swarf itself. It will also damage the paint surface.**

It is the responsibility of the installer to rectify swarf stains. New Zealand Steel Limited cannot be held responsible for remedial action outside their control. No cure will restore the surface to its original condition. However, damage can be reduced by prompt action.

#### *Mild Staining*

A household cream cleanser, used according to directions, will remove most mild swarf stains. Take great care to remove the stain only and not to cause damage to the paint film. Minimise the cleaning of unaffected material.



#### *Severe or Extensive Staining*

In these cases, where aesthetic factors are important, such as on COLORBOND® prepainted steel finishes, overpainting may be the quickest solution.

The whole visible area should be repainted, as air drying paints will weather more rapidly, and in a different manner to prepainted roofing and cladding products.

If swarf particles are painted over, rust bleedthrough is likely to occur. These particles should be removed (see above).