

A SIMPLE GUIDE TO THE PREPARATION OF SURFACES

To achieve the best results from any product, three main requirements must be met:-

1. The application must be carried out in relation to the tasks characteristic requirements.
2. The materials manner of use must allow their full properties and purpose to be attained.
3. The substrate to which the materials are being applied must be stable and support adhesion.

The preparation or making good of a substrate is critical if the materials being applied are to maintain bond strength and long term service. Many methods exist for the preparation of different surfaces and the effectiveness and practicability of each method is an important consideration since down time, weather, locality and the nature of the task may play a deciding factor in the final selection of preparation method.

Three basic requirements for good adhesion are that the substrate surface should be:-

- (a) free from loose particles, eg. rust flakes and dust
- (b) free from grease, oil, solvents and other similar foreign matter
- (c) reasonably dry. This requirement is not essential for all Epigen products since some have been formulated specifically to cure in damp or wet conditions.

1.0 Concrete

Depending on the state and age of the surface, a variety of methods may be used to prepare concrete prior to application of coatings. The aim is to achieve a surface free from all foreign matter, loose cement and aggregate particles. The latter, if not removed, may create bond failure.

1.1 New Concrete

Either of the following methods are effective, assuming no curing compounds are present.

1.11 Sand blasting or high pressure water blasting followed by the removal of dust and loose particles.

1.12 Application of a Hydrochloric Acid solution diluted in the ratio of 1 in 3 of water leaving it to remain in contact with the concrete for 1-3 minutes while agitating with a stiff brush, then flushing away with clean water. The surface should then be washed with an alkali detergent solution (or 5% solution of Sodium Carbonate) while agitating with a stiff brush, then flushed away and left to dry. Remove dust and loose particles.

It is important that flushing with water is thorough and takes place immediately after etching to clean away insoluble salts.

1.13 Abrading and spalling with pneumatic equipment designed specifically for this operation, followed by removal of dust and loose particles.

1.2 Old Concrete (uncontaminated)

Any of the methods listed in 1.1 may be used.

1.3 Old Concrete (painted or coated)

Sandblasting or mechanical spalling are the preferred methods for effective preparation.

1.4 Concrete contaminated with Non-water solubles (oil, grease, etc.)

The following method has proved to be the most successful method in this circumstance. The use of other techniques often leaves the new surface contaminated with the old contaminant.

The system employed should involve scrubbing during every step and consists of the following:-

- a) Degrease the surface with an alkali detergent (eg: Peerless Activ Shift) and flush away with clean water.
- b) Etch the concrete with a Hydrochloric Acid solution (as described in 1.12) and flush away with clean water.
- c) Wash the concrete with an alkali detergent solution (as described in 1.12) and flush away with clean water.
- d) If the concrete surface does not look clean or readily soaks up water (ie: it is still oil laden), repeat steps b) and c) as before.

Water absorption is an excellent indication that the concrete is free of all non-water solubles. If mechanical techniques are to be used, degreasing should still be carried out beforehand to remove excessive soilage.

2.0 Metal Surfaces

It is preferable to prepare metal surfaces using mechanical techniques. Abrasive blasting using Garnet is the most common method, although care should be taken when selecting the abrasive media.

Chemical preparation is also a satisfactory method on most surfaces when the task is of a manageable size.

Prepared surfaces may rust quickly so coating should take place as soon as possible after preparation.

Preparation Standards

A set of Standards for Metal finishing is compiled by many organisations including ISO, NACE, SSPC and AS/NZS and closely mirror each other universally. The standards are based on experience, not ideals which could be uneconomical or unattainable. They are recognised industry standards and should be used whenever possible. AS/NZS standards are listed under AS 1627 Preparation and pre-treatment of surfaces", the most common referenced comprising:-

AS 1627.0 Method selection guide for preparation and pre-treatment of steel surfaces.

AS 1627.2 Power tool cleaning

AS 1627.4 Abrasive blast cleaning

AS 1627.6 Phosphate treatment of iron and steel surfaces

AS 1627.9 Pictorial surface preparation standards for painting steel surfaces

AS 1627.10 Cleaning and preparation of metal surfaces using acid solutions (non-immersion)

3.0 Rubbers

Although the composition and flexibility of some rubbers reduce the adhesion of many coatings, good results can be achieved if care is taken when preparing, selecting and applying materials. Surface etching is normally required to obtain maximum bond strength, however, reasonable adhesion can be obtained by degreasing with **Epigen Diluent** followed by abrading using power tools.

4.0 Plastics

Adhesion to plastics is a difficult task and should be trialled with caution. Even though the following techniques have been found to be very successful, success has been gained by priming with a flexible material such as the **Epigen 1614**.

The plastic manufacturer or supplier should always be consulted in relation to recent practices in preparation of their material.

5.0 Glass

Most coatings will exhibit good adhesion if they possess flexible properties. Surface preparation is still important to achieve best results and can be carried out by

5.1 Etching in a hydrofluoric acid solution

5.2 Abrade and degrease.

6.0 Timber

Timber must be free of oil, grease, dirt and dry before any treatment is carried out. Preparation should be limited to sanding. Although many different sanding techniques exist, the method employed is often made simply on the basis of how quickly and effectively the task can be completed.

7.0 Bond Strengths

The strength of an adhesive bond is due to two factors, the adhesion of the adhesive to the materials being bonded and the cohesion or inherent integrity of the adhesive mass itself. It has been found that bond strength although little influenced by glue line thickness (at least over the range of 0.15 to 1.0mm) is dependant upon the following factors:-

Composition of materials being bonded

Surface preparation

Type of product used

Cure Schedule

Operational temperature and Chemical environment

Stresses and strains

The information contained in this data sheet, is to the best of our knowledge true and correct, but recommendations are made without guarantee, since conditions of use are beyond our control. Furthermore, nothing contained herein should be construed as a recommendation to use this product in conflict with existing patents.

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