TECHNICAL BULLETIN

APPLICATION OF DUNLOP TILE ALL AND WALL & FLOOR FLEXIBEL ADHESIVE TO METAL SURFACES FOR TILING

INTRODUCTION & SCOPE

In some situations tiling may be done over metal surfaces. Examples of this are ship decks, metal fittings on wall cappings or stair treads and in this bulletin we will look at the issues involved in this application.

BACKGROUND CONSIDERATIONS

Metal is a completely different substrate to the 'usual' surfaces that are tiled such as masonry or fibre-cement. It is quite flexible, has very high thermal movement properties, is completely non-porous and can be subject to corrosion both from environmental conditions when in contact with the adhesives.

The most common metal surfaces to be tiled are galvanised or Zincalume®

coated mild steel, stainless steel sheet or shower trays, copper shower trays, aluminium surfaces and ships decks which can be steel or an aluminium alloy.

Stainless steel and copper (though it does develop an oxide layer) are not subject to significant corrosion. Galvanised steel is also protected from corrosion by its coating and Zincalume® is also corrosion resistant, but is a thinner coating. Mild steel in contrast is subject to corrosion so must be protected, and aluminium or zinc are attacked by the alkalinity in the cement base of the adhesives.

Aluminium surfaces develop a coating of oxide which generally protects the surface, except where there is salt corrosion such as a seaside environment.

PROTECTION

A number of the metal surfaces require priming both to obtain a good bond, but also to protect the surface of the metal from corrosion. The best primers for these surfaces are an epoxy based primer which normally provides a good bonding surface for the adhesive and protection for the metal.

In the case of maritime applications a specific marine two part epoxy primer is recommended.

The use of galvanised metal primers which contain aluminium and zinc powder is not recommended as the alkalinity in the cement part of the adhesive can react with the metal component and create hydrogen gas with subsequent de-bonding and corrosion.

QUALIFICATIONS

These recommendations **are not to be used** for boats or marine applications. Persons requiring applications for shipping should require DUNLOP' technical assistance for other systems based on Ardex Australia products.

The following applications are *not recommended* -

⇒ Tiling over metal in ponds, swimming pools, spa or near coastal environments as there are risks related to corrosion of the metal in contact with saltwater or chlorinated water, and also deformation of the metal, as opposed to problems with adhesive bond.

⇒ Direct tile adhesion to mild steel, lead, aluminium or zinc.

⇒ The application of tiles to metal areas that are subject to high thermal stress such as metal panels exposed to the sun. The stresses resulting from temperature changes and movements could result in adhesion problems.

⇒ The application of tiles over highly deformable steel structure surfaces.

The following applications *require careful consideration* before proceeding –

⇒ The use of alkyd based, or epoxy modified metal primers (on metal substrates appropriate for these primers) as these are not designed to carry the weight of tiles in **vertical** applications.

⇒ The application of tiles to steel stair treads where there can be significant deflection and loading which may exceed the capabilities of the tiling system (e.g. size of tile and choice of adhesive).

The recommendations for various applications are tabled on the next page.

Internal Applications of Tiles over Metal Surfaces

LOCATION	SUBSTRATE	SURFACE PREPARATION	PRIMING	ADHESIVE
Internal applications	Stainless steel sheet	De-oiled with Methylated Spirits Abrasive cleaned[3], vacuumed and dried		TILE ALL WALL & FLOOR FLEXIBLE
	Stainless steel shower trays	De-oiled and surface roughened[2]		TILE ALL
		Sand/cement screed is required for falls		WALL & FLOOR FLEXIBLE
	Copper shower trays	Sanded[2] and remove all oxidation		TILE ALL
		Sand/cement screed is required for falls		WALL & FLOOR FLEXIBLE
	Mild Steel	Degrease with Methylated Spirit, Detergent wash and Abrasive clean[2 or 3] to remove scale or corrosion	Epoxy modified alkyd anticorrosive primer or epoxy two pack primer	TILE ALL WALL & FLOOR FLEXIBLE
	Galvanised steel	Clean with Detergent & Light scour[2]	Epoxy two pack primer	TILE ALL WALL & FLOOR FLEXIBLE
	Galvanised steel with spangled surface or Zincalume®	Properly sanded[2]	Epoxy two pack primer	TILE ALL WALL & FLOOR FLEXIBLE
	Aluminium	Abraded[2 or 3] to remove oxide coating	Epoxy two pack primer	TILE ALL WALL & FLOOR FLEXIBLE

External Applications of Tiles over Metal Surfaces

LOCATION	SUBSTRATE	SURFACE PREPARATION	PRIMING	ADHESIVE
External It is suggested that shaded areas are preferred as direct sun exposure can create differential movements	Stainless steel sheet	De-oiled with Methylated Spirits Abrasive cleaned[3], vacuumed and dried	NA	TILE ALL
	Mild Steel	Degrease with Methylated Spirit, Detergent wash and Abrasive clean[2 or 3] to remove scale or corrosion	Epoxy modified alkyd anticorrosive primer or epoxy two pack primer	TILE ALL
	Galvanised steel	Clean with Detergent & Light scour[2]	Epoxy two pack primer	TILE ALL
	Galvanised steel with spangled surface or Zincalume®	Properly sanded[2]	Epoxy two pack primer	TILE ALL
	Aluminium	Abraded[2 or 3] to remove oxide coating	Epoxy two pack primer	TILE ALL
	Colorbond® Steel	Degrease with Methylated Spirit, Detergent wash properly sand[2]	NA	TILE ALL

Supperscripts from text—mechanical preparation methods from AS1627-1997 Metal finishing - Preparation and pretreatment of surfaces - Method selection guide

2) *Hand Tool Cleaning* - Removal of all rust scale, mill scale, loose rust and loose paint to the degree specified by hand wire brushing, hand sanding, hand scraping, hand chipping or other hand impact tools or by a combination of these methods. The substrate should have a faint metallic sheen and also be free of oil, grease, dust, soil, salts and other contaminants.

3) *Power Tool Cleaning* - Removal of all rust scale, mill scale, loose paint, and loose rust to the degree specified by power wire brushes, power impact tools, power grinders, power sanders or by a combination of these methods. The substrate should have a pronounced metallic sheen and also be free of oil, grease, dirt, soil, salts and other contaminants. Surface should not be buffed or polished smooth.

Notes

Colorbond® and Zincalume® are registered trademarks of Blue Scope Steel Limited.

Always refer to the product data sheets for specific usage details.

The information contained herein is to the best of our knowledge true and accurate.

No warranty is implied or given as to its completeness or accuracy in describing the performance or suitability of the product application.

Users are asked to check that the literature in their possession is the latest issue.

ARDEX AUSTRALIA PTY LTD,

ABN 82 000 550 005

7/20 Powers Road, Seven Hills, NSW. 2147.