

Metallisation

Thermal spray equipment and consumables



Steel floors, decks and panels are used in many applications from train steps to oil platforms. Untreated, this steel can become very slippery, especially in wet conditions. In many applications, corrosion is also a hazard. Safe walking and industrial operating conditions are vital to personal safety and corporate productivity. Now there's a durable solution for both of these problems...

NEW 28E ARCTEC **Durable Non-slip Coating**

28E ARCTEC Durable non-slip coating

What normally happens

Traditionally, steel structures have been hot dip galvanised or painted to protect against corrosion. Hot dip galvanising can be slippery and does not easily accept paint for colouring without the use of special primers. Painting is more normal for floor plates and is sometimes applied with grit inclusions to provide a non-slip covering. However, these coatings can degrade quickly in heavy use, resulting in corrosion and an increased slip hazard.

Many large steel structures, including oil platforms, refineries and bridges, have been routinely protected against corrosion by thermal spray aluminium (TSA), zinc or alloys of the two.

Why this isn't good enough

Whilst providing unrivalled corrosion protection in very aggressive corrosive environments, pure TSA is not really durable enough to prevent long term wear on floor plates.

What is thermal spraying?

Thermal spraying is a process of applying pure or alloyed metals as coatings onto a wide range of base materials. The metals applied are not paints with metal particles, but solid metals that are melted, atomised and sprayed to make a coating.

The atomised molten metal particles cure instantly as they land on the base material that is normally grit blasted first. The grit blasted surface provides the perfect key to produce a well-adhered coating. Spraying parameters can be changed to create textured coatings that give a variety of grip levels suitable for public walkways through to fork lift loading ramps. In some applications, coatings are sealed after metal spraying.

As well as supplying the 28E ARCTEC material, Metallisation offers a complete range of thermal spray equipment to apply the finished coating and will be pleased to advise on your application.

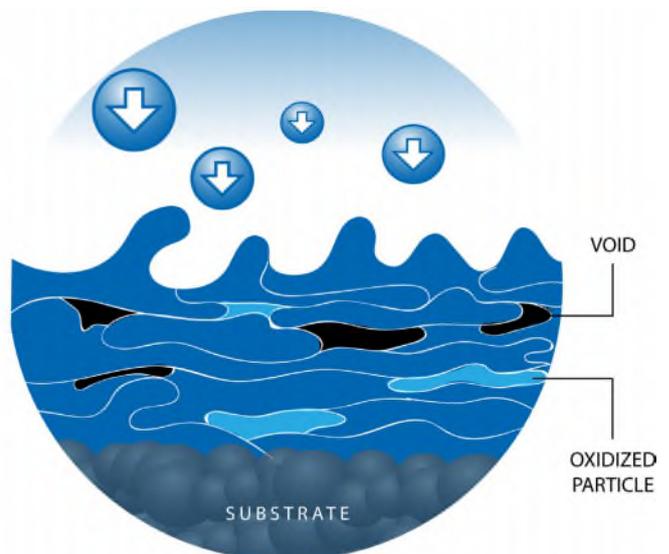
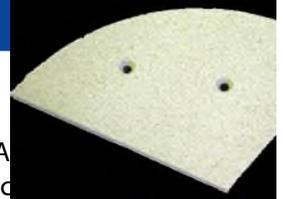
What should happen

Ideally, steel structures needing a durable coating that protects against both slip and corrosion, would be treated with a specialist coating that:

- Provides a suitable level of grip to avoid personal slips or industrial skidding.
- Provides comparable corrosion protection to aluminium as used in extremely aggressive environments.
- Provides easy application by a long-standing process covered by international standards.

All this is provided by our new 28E ARCTEC thermally sprayed coating

To meet the above requirements Metallisation has developed, **28E ARCTEC**. As a thermally sprayed coating, it is applied with a rough texture that has excellent non-slip properties and is extremely hard and resistant to wear. The resultant coating is corrosion resistant and because of its durability, enables site owners to be confident that once it is applied, they can forget rust or slipping for years to come.



28E ARCTEC Non-slip and durability testing

28E ARCTEC coatings have been tested with a Pendulum Coefficient of Friction (CoF) tester, in accordance with independent British Standards and UK Health and Safety Executive guidelines. The HSE guidelines suggest that a floor coating with a Pendulum Test Value (PTV) greater than 36 will have a low slip potential in pedestrian areas.

To prove the durability of the coating, steel plates were coated and tested as above. The coated plates were then walked on by a standard shoe on a robotic walking

machine. The plate was rotated after each step to simulate walking in a straight line and around corners.

The PTV was checked before walking and at 250,000, 500,000, 750,000 and 1 million steps. Sealed and unsealed plates were tested in wet and dry conditions.



Cycles Completed	Un-sealed sample		Sealed sample (epoxy)	
	Pendulum Test Value Dry	Pendulum Test Value Wet	Pendulum Test Value Dry	Pendulum Test Value Wet
Initial	80	75	72	66
250,000	66	50	70	63
500,000	65	49	71	61
750,000	64	43	69	60
1,000,000	64	41	68	58

Pendulum Test Values obtained in accordance with BS7976-2:2002

Application	Width of footfall route	Typical Footfalls/Day	Life with a Low Slip Potential
Light Commercial (Small Office)	2.4m (8ft)	1,000	21.8 years
Heavy Commercial (School)	1.5m (5ft)	2,500	5.6 years
Heavy Commercial (Hospital)	4.5m (15ft)	3,500	11.6 years

The coatings tested were sprayed to produce a surface texture that would wear well but not be too rough for pedestrian surfaces. If the surface has too much grip on pedestrian areas, it can cause a trip hazard. However, in some industrial applications, it is desirable and possible to spray a coating that has a rougher texture and more grip.

28E ARCTEC Corrosion testing

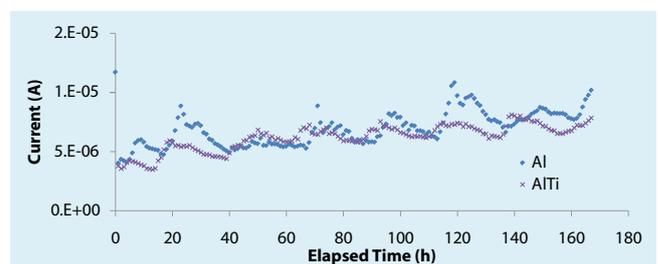
28E ARCTEC has undergone a range of accelerated corrosion testing. This offers a comparison of the performance between the new 28E ARCTEC coating and 99.5% aluminium that has offered corrosion protection for several decades in harsh, corrosive environments around the world.

Two tests were undertaken by an independent research laboratory:

- Galvanic corrosion tests for 1 week.
- Neutral salt spray corrosion tests for 1000 hours.

The latter was performed in accordance with ASTM B117.

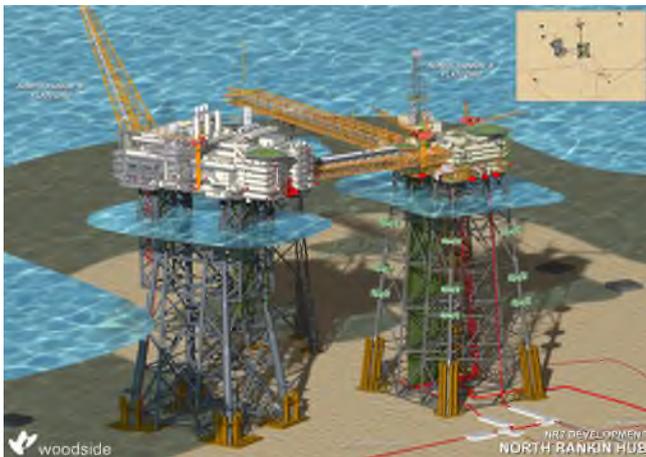
It was concluded that in both tests, the corrosion protection performance of the 28E ARCTEC was comparable to 99.5% aluminium, enabling confidence that the coating will provide excellent corrosion protection in harsh environments.



28E ARCTEC Typical applications

LNG platform bridge deck

A twin-platform, offshore LNG platform installation has an inter-connecting bridge. Following extensive evaluation of non-slip coatings, 28E ARCTEC was chosen to be applied onto the bridge deck surface for its non-slip durability and corrosion protection. The rest of the bridge structure is coated in sealed 99.5% thermal sprayed aluminium.



Forklift loading ramp

Ramps for loading and unloading of containers by forklift trucks have had a very rough 28E ARCTEC coating applied. These ramps can be very slippery in wet conditions and are often salt treated in winter. After 1 year there has been no visible rusting of the steel substrate. Forklift operators report a higher level of confidence when climbing the ramp and all lorries have been successfully loaded in wet conditions.

Other areas where 28E ARCTEC is being applied and trialled include manhole covers in pedestrian and road traffic areas, train steps and tail-lifts on trucks. The coating is also being evaluated for use on aircraft carrier decks as a durable, temperature resistant non-slip surface.



28E ARCTEC wire

28E ARCTEC wire is a solid alloy wire that has tangible benefits. The material can be supplied with very accurate batch analysis certificates. The wire surface quality is excellent and very consistent, ensuring that the spraying of the wire is reliable and does not cause undue wear.

Wire is available to order from Metallisation in the following forms:

	D300 MIG Reel	
	6-7kg	13-16Lb
	2mm	
	2.3mm (11g)	

	Coil	
	25kg	55Lb
	3.17mm (1/8")	
	4.76mm (3/16")	

	Fibre Drum	
	60kg	132Lb
	2.3mm (11g)	
	3.17mm (1/8")	