ALWAYS follow these essential care, storage & handling instructions

CARE & STORAGE: CLADDING SHEETS & GALVANISED STEEL

including cladding handling and galvanised steel maintenance instructions

FULLY CE COMPLIANT FOR EXECUTION CLASSES 1 TO 4 • BS EN ISO 9001:2015 • BS EN ISO 14001:2015 • BS EN ISO 45001:2018

JOHN REID & SONS (STRUCSTEEL) LTD trading as REIDsteel, REIDglazing & REIDmarine • Company Registration No: 617773

Four times winner of The Queen's Award for Enterprise International Trade

REIDsteel

JOHN REID & SONS (STRUCSTEEL) LTD

ALWAYS
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This booklet includes information and essential methods for the handling and storage of products such as zed purlins, profiled cladding, decking sheets and galvanised steelwork.

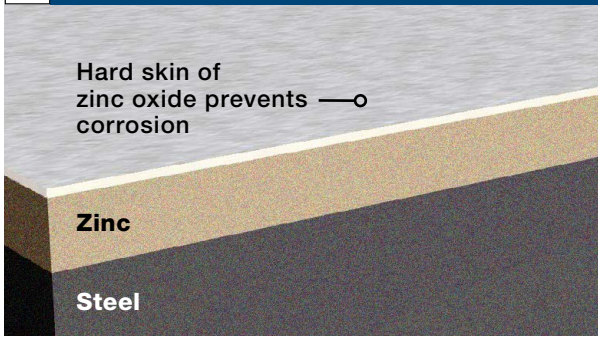
Incorrect storage and handling may result in irreversible damage to these products!

THE SCIENCE OF CORROSION
OF GALVANISED STEEL & COLOUR COATED PRODUCTS

Galvanised Steel

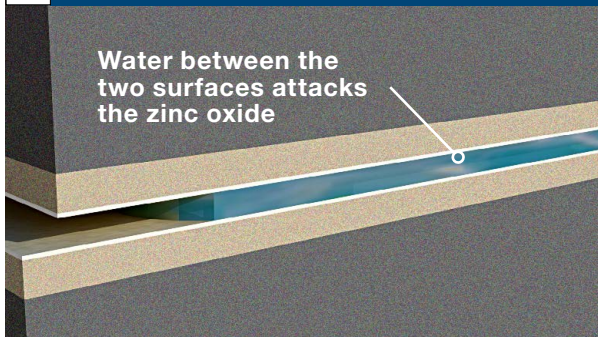
When a steel surface is galvanised, and when it is attacked by humidity in open air, there is immediate oxidisation; this produces a hard skin of zinc oxide which stays in place and does not corrode further [1]. The zinc is more attractive to oxidisation than iron, and will continue to protect the steel sacrificially for a long time.

1 Section through galvanised steel



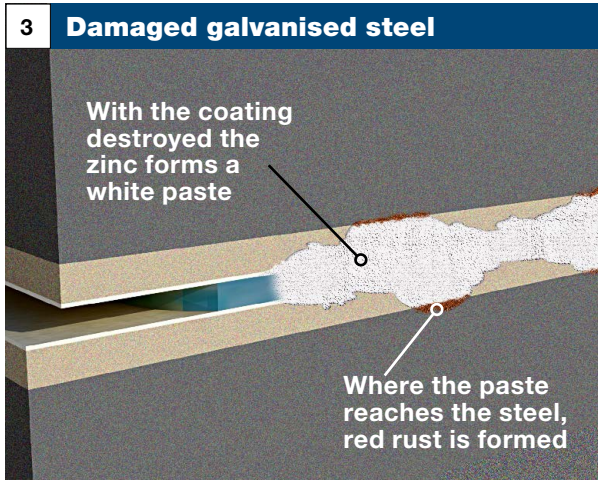
When two galvanised surface are stacked together and when there is water between the two surfaces [2], the humidity attacks the zinc, forming an electric battery between the steel and the zinc and rapidly damages the zinc.

2 Stacked galvanised steel



The oxidised zinc does not form a hard skin, but a white paste [3] which conducts electricity and speeds up the oxidisation.

3 Damaged galvanised steel

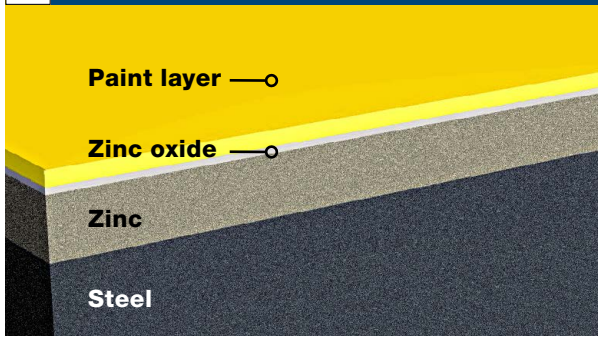


A stack of such surfaces can have the zinc coating destroyed rapidly. This ‘white rust’, will be found between any two galvanised surfaces stacked wet and touching. As soon as enough zinc has been used up, red rust will start. If the water between the surfaces is saline the corrosion will be greatly accelerated.

Colour Coated Products

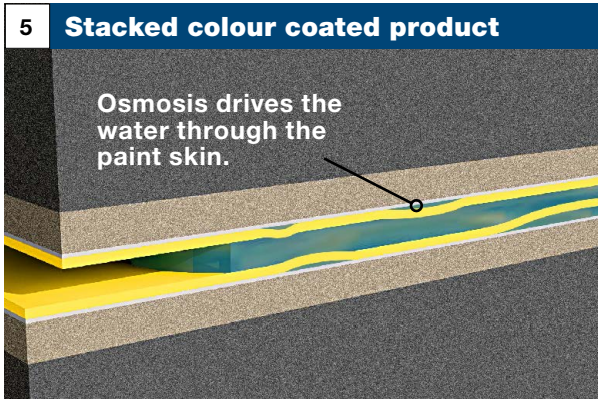
Damage can occur to colour coated galvanised steel products 4 in similar ways.

4 Colour coated galvanised steel



If there is a paint coating on one or both the galvanised surfaces stacked together with water between them, osmosis will soak up the water and drive it through the paint skin 5, (as osmosis forces bubbles of liquid under the outer skin of a fibreglass boat).

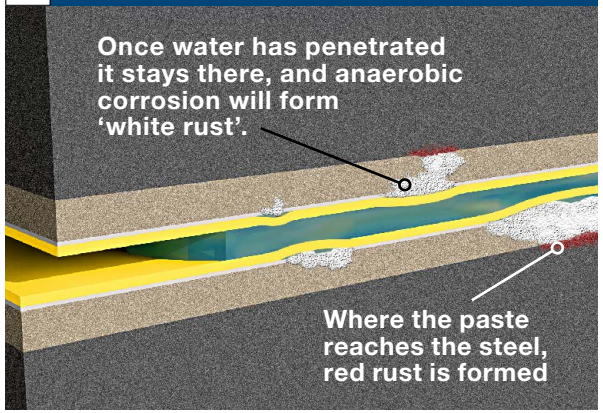
5 Stacked colour coated product



The water then stays there, anaerobic corrosion will continue and the white paste continues to form 6.

The water is trapped and anaerobic corrosion will continue even after erection. Again if the humidity is saline, the corrosion will take place much more quickly.

6 Damaged colour coated product

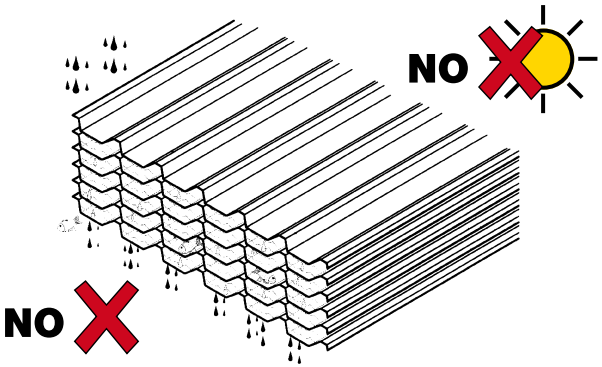


Immediate Action

This is why our sheets are packed and containerised but the packaging can be damaged in transit so proper care must be taken as soon as the goods arrive. Our packages of materials are marked with advice on the proper care.

CLADDING SHEETS
CARE, STORAGE & HANDLING

NEVER leave packages of cladding or decking materials in wet, damp or high humidity conditions.



Also avoid extremes of temperature because thermal shock can cause condensation and entrapment of moisture between the panels within the packaging, which can result in corrosion and damage to the coating of the material.

Trapped moisture can penetrate the coating through a process called osmosis and cause 'white rusting', which can lead to failure of the coating.

This risk applies to bundles of delivered materials prior to installation.

Once installed on the building envelope, materials will be naturally exposed to rainfall, sun and wind, where they will function for many years as a protective layer to the substrate material, as designed and intended.

Handling, storage and care:

1 Check materials on arrival

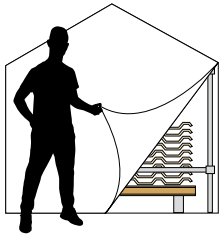
On arrival check materials are dry. If any moisture is present unpack from the bundles and dry the surfaces.

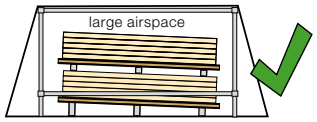
2 Ideal storage

Store bundles of cladding or decking panels inside a building and away from open doorways.

3 Alternative storage

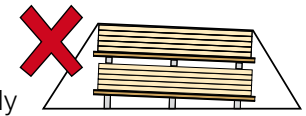
If inside storage is not possible, erect simple scaffolding around the stacks of panels and cover the scaffold with a waterproof tarpaulin/sheet to protect materials from direct sunlight and rainfall.





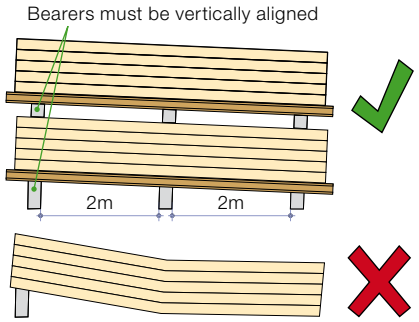
Always ensure there is a large airspace between the tarpaulin/sheet and the cladding panels to permit a full and free circulation of air.

IMPORTANT:
NEVER lay the tarpaulin/sheet directly over the bundles of cladding panels.



4 Sloping storage

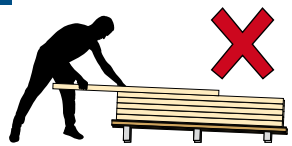
Store bundles of cladding panels on a slope to ensure any moisture can drain out of the bundles.



Bundles should be spaced off of the floor using timber or steel bearers at regular intervals along the length of the bundle.

ALWAYS FOLLOW THESE VITAL STORAGE AND HANDLING INSTRUCTIONS . . .

5 Never drag



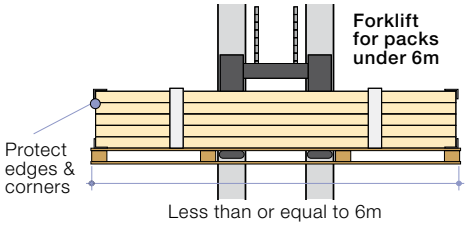
When unpacking panels from the bundles, never drag panels from the stack. Remove by lifting panel.

6 No walking

Do not store bundles of cladding panels where people will walk across them.

7 Panels under 6m - lifting

Bundles of panels less than 6 metres long may be lifted with suitable care using a fork lift truck, or by crane using suitable lifting slings.

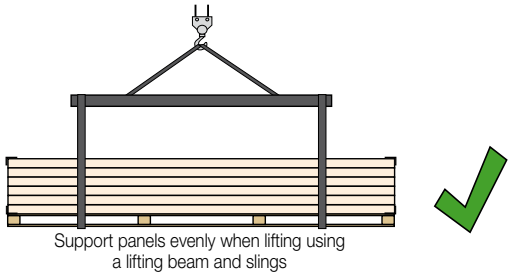


8 Panels over 6m - lifting

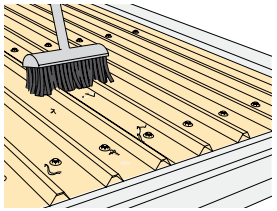
Bundles of panels over 6 metres long may be lifted by crane using a suitable spreader beam and slings.

9 Lifting support

Never lift from the centre of a bundle or panels will be creased and damaged beyond repair.



10 Sweeping & cleaning



When fixing cladding, ensure the roof, flashings and gutters are swept clean daily to remove all swarf and debris, otherwise staining and corrosion of the cladding and gutter materials will result.

11 Inspection & maintenance

Once cladding panels are installed, carry out regular inspection and maintenance.

Wash the surfaces down with water regularly to remove dirt and contaminants, particularly the underside of canopies or overhangs, which are not naturally washed by rainfall.

Ensure any damage is repaired promptly to ensure the long life of the cladding materials.

Failure to take proper care of materials will invalidate any guarantee/warranty provided.

GALVANISED STEEL
CARE, STORAGE & MAINTENANCE

Hot dipped galvanizing provides excellent corrosion protection to the steelwork; zinc-iron alloy layers are formed by a reaction between the steel and zinc and are slowly sacrificed to protect the steel.

The rate of loss is dependent on the thickness and exposure to the environment.

For example if exposed to highly corrosive or a coastal saline environment then the degradation of the coating would be accelerated, reducing the time period until maintenance is required.

Layers continue to be formed over a period of weeks or months by weathering and consist mainly of basic zinc carbonate, the formation of which depends heavily on the presence of carbon dioxide (naturally present in the air we breathe).

However, these layers cannot form if the surface of the zinc is covered for a long period of time with water having a very low or negligible mineral content, or if the air supply, and consequently the amount of carbon dioxide available, is inadequate.

REIDsteel only use approved galvanizers who provide certificates of conformity to ensure the galvanizing process conforms to BS EN ISO 1461:2009.

The following information offers some guidance on the general care/storage and maintenance of hot dip galvanized steelwork.

Appearance

The appearance/colour of galvanized steelwork can vary greatly from a bright shiny appearance to a dull grey. This is mainly due to the chemistry of the material being galvanized, the thickness of material and slight variations in the chemistry of the galvanizing process.

Hot dipped structural steelwork

All of which is not detrimental to the corrosion resistance. It is the thickness of the galvanized coating that provides the corrosion resistance not the colour.

Storage

Good storage practice before erection can help prevent unsightly staining and any premature reduction in the thickness of the galvanized coating.

The most common problem is wet storage stain, sometimes misleadingly referred to as ‘white rust’. Wet storage stain is caused by moisture being trapped on the surface of the galvanized coating which will then produce a whitish powdery substance called Zinc Hydroxide.

Pre-galvanised cold rolled rails

The damage is more aesthetic than physical and is frequently over-estimated, it will not get any worse once the conditions that have caused it have been removed, i.e. allow sufficient air to circulate.

In time it will weather and blend so it’s not really necessary to remove it unless the appearance has gone from a light staining (see fig1) to a heavy stain (see fig 2), this is where the steelwork has been left in conditions of continuous and intensive moisture.

Fig 1 - Light storage stain.

Fig 2 - Heavy storage stain.

If heavy staining occurs then it is advisable to contact Reidsteel for further advice on repairing the affected area. With light or heavy staining, if you are intending to apply any further decorative finishes then it can lead to adhesion problems and should be removed. (See guidance on cleaning/repairs).

ALWAYS FOLLOW THESE VITAL STORAGE AND HANDLING INSTRUCTIONS . . .

Good practice includes:-

- Avoid long term storage of any galvanized steel in damp and poorly ventilated conditions.
- Store off the ground on timber bolsters.
- Do not store in long grass, in puddles or in mud.
- Use timber bolsters between layers. (Note: if the timber is wet or is already stained this can cause staining to the galvanizing)
- Keep a good gap between steelwork sections to let the air circulate around the galvanized coating.
- Avoid water traps if you can, position steelwork to avoid the ponding of water.
- Do not let animals such as cattle have a free rein around the stored steel. (urine and faeces can stain)
- Do not cover with tarpaulins or plastic sheets as this can cause condensation.
- Store as far away as possible from areas of fabrication or building, steel swarf, cement and mortar can stain and affect the coating.
- Store all loose galvanized fixings/bolts in the dry and avoid condensation.
- Avoid direct contact with dissimilar metals such as brass and copper.
- Avoid areas where water/rain can run off other materials and sit on the galvanized coating, for example copper and certain hardwoods like oak.

Cleaning Galvanised Surfaces

There are a number of ways of treating different types of stains or marks. It is advised that any cleaning treatment of the galvanizing should be conservative at first and then, if the situation demands, the treatment can become steadily more aggressive.

It is important to note that mechanical methods of cleaning zinc surfaces can cause aesthetic issues. The “cleaned” areas are likely to contrast with adjacent untreated surfaces and may take a significant period of time to weather to a uniform colour. If aesthetics is a great concern, it is advisable to first test the cleaning method in an inconspicuous area in case the aesthetic effect is unappealing.

Do not constantly abrade clean galvanized steel and, where possible, avoid abrasive washing altogether. Constant abrasive cleaning will consume the zinc more quickly and therefore may reduce the life of the galvanized steel.

For light wet storage stains, remove using a stiff wire brush, the surface below may retain a blackish colour but this is not detrimental to the performance of the zinc coating. For aesthetics the area can then be covered using a zinc rich paint/paste.

For general cleaning of bulk contaminants such as dirt and the like, ordinary soaps can be satisfactorily used. For more adherent contamination or for larger areas, the use of a low pressure wash with just pure water or in conjunction with proprietary cleaning materials such as car wash or truck wash, can be effective. The car and truck cleaners are formulated to minimise corrosion on the metallic parts of vehicles so are generally suitable for use on galvanized steel although it is important that the steel be washed down with freshwater after cleaning.

Many mild stains (such as those from water ponding and water runs or, in public areas, those from food, drink etc) can be removed with the use of common household ammonia cleansers, again being sure to thoroughly rinse the galvanized article with fresh water afterwards.

Often, water draining from other adjacent steelwork that is rusting can flow on to galvanized steel and cause conspicuous brown staining. This can be treated with the use of commercial oxalic acid or a proprietary solution that has been developed for descaling pots and pans. Thorough rinsing with water is again important to remove any corrosive residues of the cleaner.

Removing Cement & Mortar Drops

Sometimes during building or renovations, cement and mortar can be dropped onto the galvanized steel and this can be very difficult to remove once it has hardened.

Firstly remove the large parts of the deposit as close to the surface as practicable, then oxalic acid can be used to remove the remaining remnants from the galvanized steel, followed with a thorough rinsing.

Other acids are more effective on the mortar or cement, but these can be very aggressive on zinc and are not recommended.

(Continued overleaf)

GALVANISED STEEL
CARE, STORAGE & MAINTENANCE

(Continued from previous page)

Removing Paint & Graffiti

Paints, such as graffiti, can be removed using thinners. If some form of scraping is required, use plastic or wooden scrapers (not steel/metallic items).

If the paint is wet or fresh, then normal thinners can be used. Once the paint has hardened, then a non-alkaline stripper can be used.

Again, rinsing is important to remove residues that may cause discolouration later and/or encourage corrosion.

Repairing Galvanised Surfaces

Although galvanized steel has excellent resistance to rough treatment, small areas of damage may occur during transport or erection.

Due to the sacrificial action of the zinc, small localised flaws or damage (up to 5mm in width) are usually self-healing and do not reduce the overall protection of underlying steelwork.

For larger areas or if you want to make a repair for reasons of aesthetics then these can be repaired on site. If you are unsure of the extent of damage please contact REIDsteel for further guidance.

Repair using Zinc rich paint/paste

The paint/paste should contain (when dry) not less than 90% zinc by weight.

Preparation of the damaged surface will be influenced by the type of paint selected and the anticipated service conditions.

Experience shows that in general organic zinc-rich systems are more tolerant of surface preparation.

The following general guidelines apply:

- Surfaces to be repaired with a zinc rich paint or paste should be clean, dry and free of oil, grease, corrosion products or other surface contaminants.
- If the area to be repaired includes welds, first remove all flux residue and weld spatter.
- To ensure that a sound repair coating can be achieved the galvanised coating should be feathered back to a firm intact surface as necessary. Surface preparation of the area to be repaired would then normally involve degreasing as necessary and/or use of a power disc sander, wire brushing or other means of abrasion to achieve a bright metal finish.
- Spray or brush-apply the zinc rich paint or paste onto the prepared area. Apply the product as recommended by the paint manufacturer as a single coat or as a series of coats as required to achieve the minimum average coating thickness requirement.
  Note it is important to allow a coat to fully dry before a subsequent coat can be applied.
- Coating thickness measurements with either a magnetic or electromagnetic gauge might be taken to ensure that the applied repair coating meets specification requirements.
- Where aesthetics are critical the repair coating may be over-coated with a zinc-aluminium paint to help blend it in with the surrounding galvanised coating.

REIDsteel are experts in the design and build of the following:

- **Aircraft hangars, hangar doors and hangar extensions**
- **Bridges**
- **Car parks**
- **Church and community buildings**
- **Cranes**
- **Environmental structures**
- **Grandstands and stadia**
- **Housing, hospitals and schools**
- **Hurricane and earthquake resistant buildings**
- **Industrial and warehouse buildings**
- **Leisure and sports buildings**
- **Office buildings, commercial buildings and retail superstores**
- **Security gates, barriers and defensive structures**

REIDsteel
JOHN REID & SONS (STRUCSTEEL) LTD
Strucsteel House, 3 Reid Street,
Christchurch, Dorset BH23 2BT England
Telephone: + 44 (0) 1202 48 33 33
Facsimile: + 44 (0) 1202 47 01 03
E-mail: sales@reidsteel.co.uk
Website: ***REIDsteel.com***

REIDsteel is a trading name of
John Reid & Sons (Strucsteel) Ltd
Company Registration No: 617773