



Storage Guidelines for Prepainted Metal

Technical Paper

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This guidance is given by ECCA to help users to get the most out of their prepainted metal. This document represents best practice agreed across the coil coating industry. However, this does not in any

way guarantee success and ECCA members may wish to suggest alternative storage methodologies for their specific products.

Introduction



Prepainted metal is used in many applications across the world, particularly the creation of aesthetically pleasing, high performance buildings. However, as with all materials, to achieve the longest possible service life and the best possible appearance, care is needed when handling and storing the material prior to use.

Physical damage of the material and premature corrosion of the metallic substrate should be avoided when handling and storing prepainted metal. The guidelines described in this document are intended to help users avoid both problems.

Prepainted metal is generally produced and delivered in coil form and so these guidelines start by looking at the handling and storage of coil.

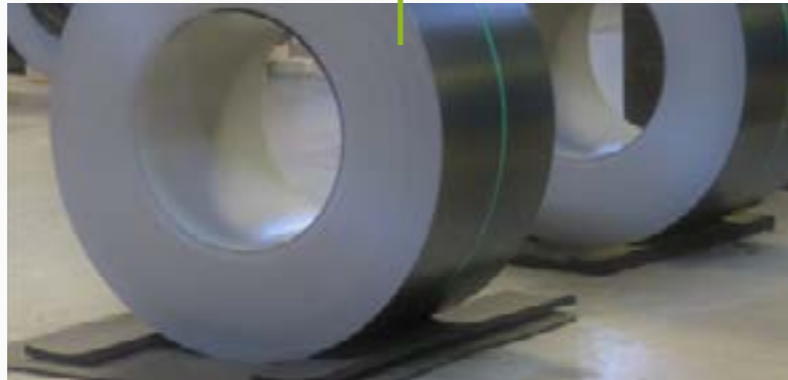
For many applications, prepainted metal is subsequently cut, handled and stored in sheet form and so further guidelines are given specifically for sheet. Finally, significant volumes of prepainted metal are stored temporarily on the building site prior to erection. Guidelines for storage and handling on building sites are also given.

In all cases, this guidance is intended to ensure that the prepainted metal arrives at its final use in optimum condition. Avoiding damage not only ensures long life and a high-quality surface finish but can also prevent yield losses and re-manufacturing costs. In some cases, it is not always practical to adopt all of the elements of guidance given here and so the guidance given here:

- The essentials – there is no excuse for not sticking to these.
- Best practice – follow these as far as possible to get the most out of your prepainted metal.

Coil storage & handling

The essentials



Keep dry

Even with the best coating technology, the substrate metals used for prepainted metal (e.g. steel or aluminium) can corrode if exposed to water during storage. When the prepainted metal is coiled, capillary action can cause water to creep between the laps of the coil and stay there for prolonged periods of time. Even if coils cannot always be stored inside, care should be taken to keep them dry whilst avoiding the possibility of condensation. Never rely on paper or plastic wrapping to keep a coil dry – these are not designed to keep out water and can even cause more problems by not allowing any moisture to escape from the coil. It is always important to ensure good ventilation to avoid the build-up of water vapour and to ensure that any water has a chance to dry out.

Avoid handling damage

Coils should be treated with care and never dragged. It is important that coil storage is arranged with plenty of space between coils to allow for crane and forklift movement without any risk of damage. Examples of edge damage are shown below.



Store coils on a clean, smooth surface

Coils of prepainted metal can weigh up to 20 tonnes and even small coils can weigh more than 1 tonne. Any debris or unevenness will result in this weight being supported on a very small area. A small indentation on the outer lap can travel several laps into the coil and cause many metres of scrap. Ideally, dedicated storage facilities should be used; it is always essential that the coil sits on clean, smooth supports.

Use promptly

As with any material, the properties of prepainted metal change slowly over time. In particular, some products will harden over time, resulting in a loss of flexibility for forming. Also, if a protective strippable film is applied, the material should be used promptly to avoid the likelihood of adhesive residues being left on the surface of the product. A good general guideline is to use all material within 3 months of manufacture and a first-in-first-out (FIFO) stock rotation system is recommended.

Best practice



Store inside

The easiest way to ensure that the material is kept dry is to always store it inside.

Store in a temperature and humidity-controlled environment

Even when inside, if the air temperature varies greatly, condensation can form on metal coils which can promote corrosion, so it is best to ensure that the coil storage temperature remains reasonably constant.

Avoid condensation

If it is not possible to store coils at a constant temperature, then the operator should always be vigilant to avoid rapid temperature changes (such as taking a coil from an unheated warehouse at 0°C to a heated one at 20°C) which could lead to condensation on the metal. This is particularly true when coils are delivered straight into a heated warehouse; it is essential that all coils are well ventilated to remove any condensation as quickly as possible.



Ovalisation of a coil caused by poor storage practice.

Use dedicated storage facilities

The best storage solution is to use purpose-made stillages with coil contact points which are either wooden, rubber or covered in felt. Stillages should be inspected regularly to ensure that they remain in good condition. The coil contact surfaces should usually form a V-shape to hold the coil and prevent ovalisation. If coils must be placed directly on the ground, it is best to use rubber or felt mats which spread the weight. If coils are delivered on wooden pallets (see below), these generally represent a good storage solution and it is often best to leave them on the pallets until use. However, small, part-used coils do not usually "sit" on wooden pallets as originally intended, so care is needed to prevent damage.



Best Practice



Avoid double-stacking of coils

It is often tempting to store a second row of coils on top of the first (double-stacking) or to even multiple-stack coils. This practice increases the likelihood of damage, because more handling is required, and it also increases the weight on the bottom coils, so increasing the possibility of indentations or pressure marking. Double-stacking also dramatically increases the risk of accidents and injuries to the operators. For both safety and damage reasons, double-stacking should be avoided wherever possible. Coils stored with the bore vertical (so-called eye to the sky) can sometimes be safely multiple stacked on pallets, but it is essential in this case to ensure that the top cover of the coil will cause no damage and will allow the next coil to sit safely on top.

Use soft lifting gear

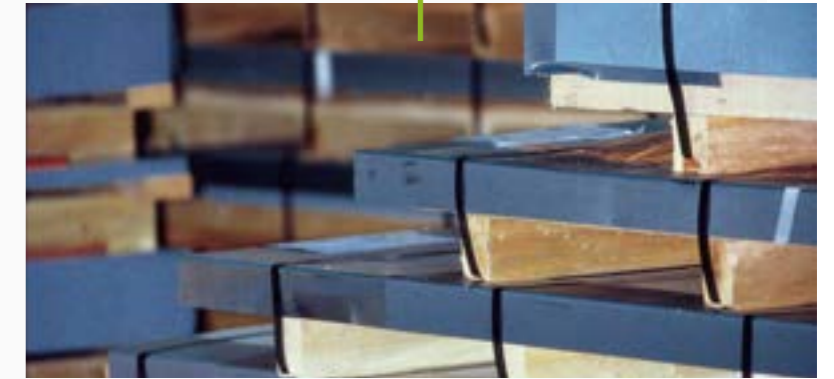
Coils will usually be handled by either crane or forklift truck. In either case, it is best practice to cover the lifting gear with a soft material such as felt or cardboard to help in avoiding damage to the inner laps. Chain slings should never be used.

Condition the material before use

Some prepainted metal products are designed to be processed at a certain temperature, for example to ensure the optimum flexibility. In these cases, it is important that the coil is stored at this temperature for at least 24 hours before use. It is always advisable to seek guidance from the supplier whenever using a new product.

Sheet storage & handling

The essentials



Keep dry

As for coils, it is essential that stacks of sheets are kept dry because moisture can easily be trapped between individual sheets by capillary action. It is then difficult to remove the water, and corrosion of the metal can be rapid. Even if stacks of sheets cannot always be stored inside, care should be taken to keep them dry, including avoiding the possibility of condensation. Never rely on paper or plastic wrapping to keep sheets dry – these are not designed to keep out water and can even cause more problems by not allowing moisture to escape. It is always important to ensure good ventilation to avoid build-up of water vapour and to ensure that any water has a chance to dry out.

Avoid handling damage

Sheets should be treated with care. It is important that storage is arranged with plenty of space to allow for movement without any risk of damage. When removing sheets from a stack, never drag them off since this can scratch the sheet underneath.

Use promptly

As with any material, the properties of prepainted metal change slowly over time. In particular, some products will harden over time, resulting in a loss of flexibility for forming. Also, if a protective strippable film is applied, the material needs using promptly to avoid the likelihood of adhesive residues being left in place. A good general guideline is to use all material within 3 months of manufacture and a first-in-first-out (FIFO) stock rotation system is recommended.

Best Practice



Store inside

The easiest way to ensure that the material is kept dry is to always store it inside.

Store in a temperature and humidity-controlled environment

Even when inside, if the air temperature varies greatly, condensation can form on metal sheets which can promote corrosion, so it is best to ensure that the storage temperature remains reasonably constant.

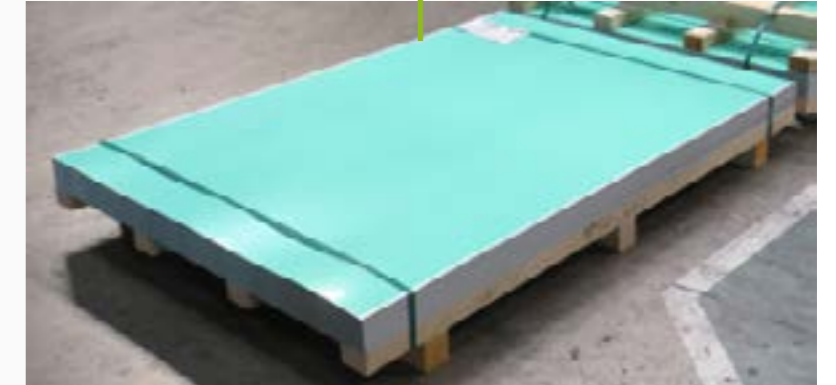
Avoid condensation

If it is not possible to store sheets at a constant temperature, then the operator should always be vigilant to avoid rapid temperature changes (such as taking material from an unheated warehouse at 0°C to a heated one at 20°C) which could lead to condensation on the metal.

Take care over storage

Packs of sheets are generally delivered and stored on a framework of wooden battens. It is important to ensure that these battens remain in good condition and they remain vertical to ensure their correct loading and the avoidance of pressure-spots. If the stack is removed from the original packaging, it is important to ensure that it is adequately supported and never placed directly on the ground.

Best Practice



Limit the height of sheet stacks

It is often necessary to stack packs of sheet on top of each other. However, care should be taken since this will increase the amount of handling required to access different sheets. The height of stacks should be limited to avoid excessive pressure being applied to those at the bottom. Some products are particularly susceptible to marking from this pressure and advice should be sought from the manufacturer for these cases. Where multiple bundles of sheets are stacked, care should be taken to align the timber bearers on successive packs.

Handle with care

It is advisable, wherever possible, to use suction or magnetic lifting devices to lift sheets from packs and where this is not possible, sheets should never be dragged from packs which could result in scratching. It is also advisable, where possible, to handle sheets on the reverse side so that any damage does not affect the appearance of the finished article.

Condition the material before using

Some prepainted metal products are designed to be processed at a certain temperature, for example to ensure the optimum flexibility. In these cases, it is important that the sheets are stored at this temperature for at least 24 hours before use. It is always advisable to seek guidance from the supplier whenever using a new product.

Building panels

The essentials



Much pre-painted metal is used for building panels and the same basic principles apply on building sites for the storage and handling of pre-painted metals. It is important to take appropriate steps to avoid corrosion and damage to panels of pre-painted metals on prior to use on the building.

Keep dry

Although the pre-painted metal panels can be relied upon to resist the weather for the life of the building, it is on the building site where they are most prone to corrosion. As with coils and bundles of sheets, water can often penetrate between panels by capillary action and remain there even when the surface water has dried out, promoting corrosion of the substrate. As there is often no natural rain-proof cover on a building site, it is particularly important that all steps are taken to keep panels dry.

Avoid damage

Building panels should always be treated with care. The exact shape of the panel has been designed to give a tight-fitting, weatherproof building envelope and any dents or kinks, particularly to the edge of panels, can affect the weathertightness of the final building. Moreover, scratches to the surface which may not appear significant at first sight can provide weak points in the coating which, over time, may cause corrosion, again hampering the weatherproofing of the building as well as being unsightly. Panels should be stored in a dedicated storage area away from the flow of people and machines, with plenty of separation to allow for the manoeuvring of forklift trucks or other lifting gear. Panels should always be lifted with care to avoid damage to the edge as well as to avoid scratching; they should always be supported along their full length to avoid distortions.

Use promptly

The longer the building panels are present on-site, the more likelihood of them being damaged. Additionally, corrosion is promoted by prolonged damp conditions, so one way to avoid it is to ensure that the building panels are on-site for the minimum time possible. This demands sophisticated ordering, delivery, stock rotation and overall project management. Where a strippable film is applied to the panel to protect it from damage, this should be removed as soon as feasible once the panel is mounted since the adhesives used tend to strengthen with time, particularly in sun-light, making removal more difficult and increasing the likelihood of adhesive residues remaining on the panel which can lead to unsightly dirt retention. At the very latest, strippable film must be removed no later than 3 months after initial application or no more than 1 month after the panel has been fixed on the building.

Best practice



Store inside

The most reliable way of ensuring that building panels remain dry is to store them inside a weatherproof building, away from open doors or vents.

Store under cover

On many building sites, it is impractical to store panels inside. In this case, it is important to arrange a good covered area to store the panels. This could be done by erecting a scaffold frame and covering with a continuous, waterproof tarpaulin or sheet of plastic. Alternatively, a tarpaulin or other waterproof sheet can be draped over a bundle of panels, but in this case, it is important to ensure good air-flow all around the panels and that it is not resting on the top of the bundle by placing spacers between the top-most panels and the waterproofing. In any case, it is important to secure the tarpaulin or waterproof sheet all round the pack, again ensuring that a gap is maintained to promote air flow.

Store off the ground

Most bundles of panels will be delivered on wooden "skids" which should be retained for storage of the panels. This will ensure that the panels do not come into contact with the ground and that there is adequate air-flow around them. Use of this packaging arrangement will also ensure that the panels are supported adequately along their full length. This is equally important for individual panels when removed from the main stack. Ideally, panels should be raised off the ground at least 30cm to ensure good air flow, no splashing and to minimise the risk of damage.

Store on a slope

While panels should always be stored on smooth, level ground, it is advisable to store them on a slight slope ($3^{\circ} - 5^{\circ}$) so that any water which might creep in will run off.

Lift with care

If panels or bundles are lifted with a crane, nylon slings should be used and never wire rope slings. Slings always risk damaging the edge of the panels, so extra care must be taken. A better alternative is to use a specially designed spreader bar which ensures that the weight is taken at the right points. For sandwich panels, specially designed suction-cup devices are often used which support the panels well and minimise any risk of damage. If a forklift truck is used, the forks must be arranged to support the panel along its length, alternatively a spreader arrangement should be used. Where panels are handled manually, they should be lifted from the edge and carried upright with the long edge horizontal. For panels over 3m in length, two or more people should be used to support the panel and prevent buckling.



Ecca objectives

- Increasing the awareness of prepainted metal through promoting its environmental, cost, quality and design benefits.
- Stimulating market, application, product and process development.
- Setting quality performance standards and developing test methods.
- Granting of Quality and Sustainability Labels for prepainted metal on the basis of the technical and sustainability requirements defined in the ECCA Premium® Label manual and based on independent third party control.
- Creating an industry network and forum for the development and exchange of ideas.
- Representation of the Industry in its contacts with Public Officials, Public Authorities, other Trade Associations and Professional Bodies.