

## **INTERSTAL S.A. storage instructions for galvanised steel products.**

The document contains general information and recommendations on how to store galvanised steel products and applies in the absence of individual recommendations or instructions for a specific product.

Galvanised steel products delivered as transport packages (on pallets or in bundles) are ready for immediate processing or use for their intended purpose. The products are not prepared for long-term storage, therefore it is recommended that they be unpacked and stored loosely until used. If it is not possible (at short notice) to unpack for further processing or use, ensure that the products have not been exposed to water during transport or loading/unloading. If the articles are clean and dry, they can be prepared for the storage process in a manner appropriate to the type of product range and as recommended.

The choice of the appropriate storage method for galvanised steel products depends on several factors such as:

- the type of product stored (sheet metal, steel strip, sections, tubes and profiles);
- the duration of planned storage (short or long term);
- the method of packaging;

The choice of storage method includes the selection of a suitable storage location that provides protection from external factors. An important element is the possibility to monitor environmental conditions, in particular humidity and temperature.

Galvanised or additionally coated products should be stored under conditions that provide protection against atmospheric and environmental influences.

For all types of galvanised products including pipes, profiles, coils, steel strips as well as flat components, closed, covered, dry and ventilated areas are recommended, away from:

- wet objects;
- wet concrete;
- corrosive substances, chemicals, fertilizers;
- products containing copper and lead, dust, ashes and soot;
- sources of high temperature.

Changes in temperature and humidity in unheated rooms, can cause condensation on the surface of the products. Even short-term exposure of galvanised products to rapid changes in temperature and humidity can result in the appearance of “white corrosion”.

If outdoor storage is unavoidable, temporary outdoor storage of galvanised products is acceptable, but they should be placed in covered areas with free access to air. Plastic sheeting should not be used for covering. A minimum distance of 25 cm from the ground is recommended.

In special cases, parcels may be stored briefly outdoors. If they become damp or wet from rain or snow, they should be dried immediately to prevent the risk of surface oxidation.

In order to prevent white corrosion, moisture must not be allowed to accumulate inside the packages. The products should be protected from direct contact with water. The parcels should be laid in such a way as to facilitate drying and air circulation between the pipes as well as gravitational drainage.

The optimum air humidity should be below 60% and the temperature should not exceed the range of -10 to +35 degrees Celsius.

Correct storage of products can result in the appearance of patina, i.e. atmospheric corrosion, which, depending on air humidity, environmental conditions, can appear on products over time. In the long term, white corrosion may appear naturally to a small extent.

Improper storage can lead to intense white corrosion. White corrosion on zinc is a natural process occurring as white deposits or tarnishes. It is a type of electrochemical corrosion that can occur on new zinc coatings. Zinc reacts under atmospheric conditions, forming products such as zinc oxide, zinc hydroxide, basic zinc carbonate, as well as released compounds containing zinc sulphate or other environmentally-dependent chemicals.

The causes of this phenomenon are:

- prolonged exposure of the coating to moisture;
- exposure to an acidic or alkaline environment;
- high temperature;
- mechanical damage
- lack of maintenance.

White corrosion consists mainly of zinc oxide and hydroxide in the form of an easily removable deposit.

If this occurs, the pipes should be dried immediately and subjected to a cleaning and maintenance process to avoid degradation of the zinc coating. Dedicated tools and manufacturer-recommended chemicals should be used for this purpose. Attention should also be paid to deposits of aggressive substances (e.g. soot). Contaminated surfaces must be cleaned with a recommended solution with a non-abrasive and non-reactive detergent.

For hot galvanised products, the occurrence of dark and light grey areas on the surface, slight unevenness of the outer surface as well as white corrosion, provided that the zinc coating has the required minimum thickness, do not constitute grounds for complaint.

Corrosion can also occur in mechanically damaged areas. Mechanical damage is usually due to improper handling of pipes, especially when transporting long components. Attention should be paid to:

- safe lifting techniques;
- securing of pipes during transport (proper fastening);
- avoiding mechanical damage.

If mechanical damage is noticed, it should be repaired immediately and, in particular, protected with suitable protective coating loss preparations.

Some products are protected against mechanical damage (during transport) by a special protective foil. The protective foil should be removed from the product within 3 weeks of production. Exposing products covered with a protective foil to prolonged exposure to atmospheric influences causes the foil to bind with the surface of the sheet and, as a consequence, leave adhesive marks, tear the foil during removal, or damage the coating.

Long-term storage of steel pipes and profiles requires steps to be taken to monitor and regularly check the condition of the pipes, as well as cyclical maintenance. Regular cleaning of pipes from dust and dirt is recommended, and preservatives are also worthwhile.