GÓR-STAL®
SANDWICH PANELS

INSTRUCTIONS FOR USE OF SANDWICH PANELS WITH STAINLESS STEEL CLADDING

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INTRODUCTION

Gór-Stal pays great attention to the friendly and professional service of its customers, therefore we have prepared instructions for using GORLICKA® sandwich panels with stainless steel cladding.
Most metal construction materials are constantly exposed to corrosive hazards. The risk of degradation can be significantly reduced through the use of appropriate methods of protection and appropriate selection of materials. We recommend to follow the instructions below, in order to maintain high quality of cladding of stainless steel sandwich panels. Should you have additional questions, please do not hesitate to contact our Technical Department.

ABOUT STAINLESS STEEL

What is stainless steel?
Stainless steel is a common name for many grades of quality steels which, due to the chromium content, are resistant to destruction under the influence of chemical or electrochemical reaction with the surrounding environment. This property is called corrosion resistance.
Stainless steel is primarily an iron alloy containing > 10.5% of **chromium (Cr)** and **<1.2% of carbon (C)**, protected with a passivation layer of chromium oxide, which is formed in a natural way on its surface as a result of a combination of chromium and moisture in the air If the surface is damaged, the passive layer regenerates itself. This is a unique feature that causes corrosion resistance.

PROPERTIES OF STAINLESS STEEL:

Resistance to fire - stainless steel has excellent resistance to fire from all metal materials used in construction industry. Steel can also be used at winter temperatures without the risk of diminished strength or cracking, which guarantees a long service life.
Corrosion resistance - with a chromium content of 10.5%, stainless steel is permanently protected with a passivation layer of chromium oxide. If the surface is damaged, the passive layer is regenerated. This is a unique feature that causes corrosion resistance.
Ease of cleaning - traditional cleaning products work effectively without causing damage to the surface.
Recycling - stainless steel is an "ecological", completely recyclable material. In the construction industry the level of effective material recovery is close to 100%. Steel is also completely neutral for the natural environment.

Additional advantages
The addition of components such as nickel, molybdenum, titanium and niobium gives the steel additional properties:
- corrosion resistance in highly caustic environments
- resistance to oxidation and creep at high temperatures
- durability and plasticity at low temperatures,
- good mechanical properties
- ease of processing (stamping, bending, hydrodynamic forming, welding, soldering, etc.)

How to select stainless steel
In facilities in rural and urban areas, stainless steel 1.4301 (AISI 304) containing 18% chromium (Cr) and 8% nickel (Ni) is widely used.

TRANSPORT AND STORAGE RECOMMENDATIONS

Gór-Stal pays great attention to service of its customers, therefore we have prepared the following transport and storage recommendations. It is recommended to follow the guidelines included in the following instruction in order to maintain the high quality of stainless steel sandwich panels.

STORAGE RECOMMENDATIONS

Beware of contact with iron and carbon steel

It is necessary to prevent the build-up of carbon steel particles on the surface to prevent rust and discolouration of the steel surface. We recommend that you pay particular attention to all stages of manufacturing, transporting, handling, storing and assembling sandwich panels. Steel fasteners cannot be used for lifting the product. Please pay attention to the unsecured elements in forklifts that may have direct contact with the cladding. The contact of various metals with each other in the presence of moisture causes that there is a risk of bimetallic (galvanic) corrosion. You can prevent such a phenomenon, follow the above suggestions and apply the so-called insulating material.

Beware of contact with iron and carbon steel

Protect stainless steel against contact with chemicals, including dyes, glues, adhesive tape, as well as oils and greases. If the use of such agents is necessary, please check with the manufacturer, of their suitability for use on the surface of stainless steel. We recommend testing a dedicated "chemistry" on a steel sample.

Humidity

Plastic packaging of panels may cause condensation of moisture (inside the package), which in turn may cause corrosion centers. This occurs due to long-term storage of panels in a humid environment, as well as during sea transport in moist or high salinity conditions.

Lifting and moving

Be especially careful when transporting the panels so as not to cause mechanical damage to their surface. All attachments used to carry stainless steel components should be cleaned shortly before use.

GUIDELINES FOR INSTALLING STAINLESS STEEL PANEL

Required equipment:

All work on the construction site related to steel processing must be executed in specially isolated places, using tools designed only for work with stainless steel. Use tools also made of stainless steel to avoid so-called contact corrosion.

We recommend stainless steel screws

The assembly of sandwich panels with steel claddings should be done using screws, which are also made of stainless steel. The screws should be stored directly on the construction site. Please store them in a dry room, properly packed and marked. If you choose other joining materials, they should be separated from stainless steel using non-metallic washers and bushings.

Protective film

The surface of the stainless steel panels is protected by a strippable plastic protective film which helps to protect the panel. Elements with such protective packaging should be left on the surface of the panel **for no longer than 2 months from the date of production.**

CLEANING

Think about cleaning already at the design stage

It is worth thinking about the principles of cleaning sandwich panels with a stainless steel cladding, the operation of which may require frequent washing, when designing a facility. It is necessary to take into account the necessity of additional sealing of the panels joints (in addition to compounds and gaskets normally applied in locks) so that even traces of water and cleaning products left free, do not cause moisture, deterioration of the thermal and moisture parameters of the partitions and do not constitute potential corrosion centers. Therefore, we recommend using neutral sealants based on silicone, butyl and polyurethane. We strongly discourage the use of acidic sealants (e.g. acetic acid sealers). All sealing of sandwich panels should be checked regularly and replaced if necessary.

Cleaning guidelines

01. General recommendations for stainless steel cleaning.

• Clean the panels with water to remove dirt.

• Then wash with water (preferably warm) with soap, detergent or 5% ammonia. If the dirt is large, a soft fiber brush with long bristles can be used.

• Rinse with water.

In order to obtain a satisfactory surface appearance, it must be wiped dry using overlapping movements, starting from top to bottom.

A damp cloth or suede will be appropriate for cleaning ordinary surface stains, e.g. fingerprints, smudges, etc. For more complicated impurities, it is sufficient to use nylon abrasive pads. It is forbidden to use cleaning agents containing chlorides, e.g. bleaching agents or strong acids. Please also pay attention not to use of water contaminated with the above substances.

02. Cleaning with pressure washers

Pressurized cleaning can be used, if the surface of stainless steel is heavily soiled and requires special cleaning. However, as with other materials, pressurized water can carry hard, contaminant particles with sharp edges that can scratch the surface. Please remember that stainless steel sheets used in GOLRICKA® sandwich panels are 0.5 mm thick and the washing pressure must be adjusted accordingly so as not to cause deformation of the panel surface. The pressure of the clean water used for rinsing must not exceed 5 MPa (50 bar) at the nozzle exit, at the point of impact of the water jet, it should not exceed 0.04 MPa (this pressure produces a 5 MPa jet at the nozzle setting at an angle of 15° at a distance 20 to 30 cm from the wall).

03. How to remove resistant stains

Above all, do not use scouring powders for resistant stains, as those products can scratch the surface of stainless steel. You can use mild household cleaners containing soft calcium carbonate additives. They are also suitable for cleaning traces of water and minor discoloration. After cleaning, the deposit should be removed with demineralized water. Thanks to this, you will avoid smudges and stains on the surface.

04. Traces of oil and fat

You can remove greasy stains with alcohol-based agents, for example with methylated spirit and isopropyl alcohol or other solvents, including acetone. Those types of products do not pose a corrosive hazard to stainless steel. However, we recommend caution when using solvents, avoid spilling them on the surface of stainless steel, as their complete removal can be very difficult. We suggest using the solvent several times with a clean, non scratching cloth until all unwanted traces have been removed.

05. Removal of paint or graffiti

This type of dirt can be removed using commercial paint removers, either alkaline or solvent based. Details can be found on the labels of individual products.

06. Neglected surfaces

Highly neglected surfaces can be cleaned with metal polishes, for example for cleaning chromium plated elements. Often, with commercial stainless steel cleaning products containing orthophosphoric acid that work very well. The washed surface should be rinsed with demineralized water and dried. It is recommended to clean the entire surface of the element, this will eliminate the ununiform appearance.

07. Hard water scale, mortar and cement

We usually use a 10-15% orthophosphoric acid solution to remove such problematic contaminants. We recommend using a warm solution, then neutralize the surface with diluted ammonia and rinse with deionized water and dry it.
Manufacturers of mortar propose the use of dilute hydrochloric acid for removing this type of stains - however, those chemicals should not be used for stainless steel!

08. Contamination with iron particles

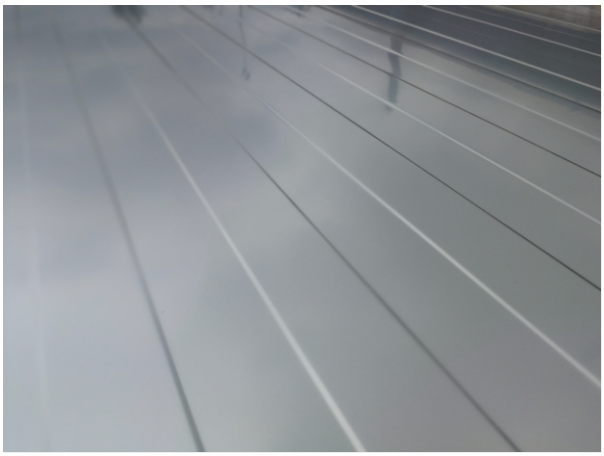
Be especially careful of iron particles that may occur during contact with tools, carbon steel structural elements, scaffolding, and when performing carbon steels welding, cutting, drilling and grinding works nearby. After this type of activities, you should immediately remove them from the surface of stainless steel, because they corrode very quickly in the presence of moisture. Depending on the degree of discolouration of the surface, it is recommended to gradually remove impurities caused by contact with iron particles, being careful not to spread them further.
Recommended actions:

- Mild discolorations or "efflorescence" can be removed with cleaning pastes usually containing calcium carbonate and surfactants. Details on the product label.
- Fresh iron or steel dust particles from grinding can be removed with a saturated oxalic solution, applied to the surface with a soft cloth or cotton wool. Do not rub the solution just leave it for several minutes.
- Small rust discolorations can be removed with cleaning agents with orthophosphoric acid. The risk of etching the surface will be minimal while being careful and observing the time of exposure to acid.
- Intense rusty stains caused by the corrosion of iron particles on the surface can be removed by etching or passivation. Both processes are executed after degreasing the surface (removing oil, fat and other organic impurities).

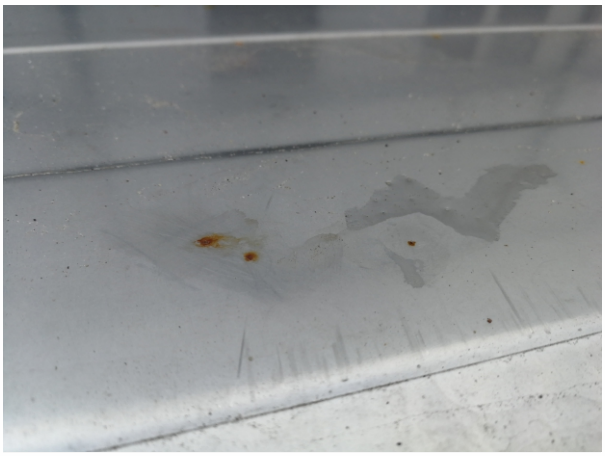
09. Surface repair cleaning

When in doubt as to how to clean, please contact specialized contractors who will dispel your doubts. Any discoloration usually indicates the occurrence of corrosion in the initial stage. It is good then to act well and apply surface repair cleaning. Repair cleaning products are acidic, unlike neutral or alkaline agents used to remove dirt. Because specialized acidic cleaners for stainless steels can also damage other metal materials such as aluminum or galvanized carbon steel. Therefore, we encourage you to take extra care at every stage of cleaning, and to contact specialists of Gór-Stal, if in doubt.

EXAMPLES OF STAINLESS STEEL SANDWICH PANELS INCLUDING PITTING CORROSION



01. Intact panel



02. Developing pitting corrosion

03. Advanced pitting corrosion

The examples given are the result of a constant exposure to chlorides (resulting from operating conditions - a cleaner containing active chlorine). they are the direct cause of corrosion of stainless steel in the absence of cyclic washing them from the surface.

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