HINOX

LUXURY HARD-**WEARING**

DIDIEFFE

OPENING WAYS

THE USE OF STAINLESS STEEL IN SHUTTERS

AND ITS CORRECT MAINTENANCE

DIDIEFFEGROUP.COM

STAINLESS STEEL • ACCIAIO INOX
AISI
316
MARINE

WHY HìNOX ?

Because Hìnox is the answer to the need for a product that must be durable and at the same time beautiful and customisable.
Hìnox is what the market demanded from Didieffe, and what Didieffe promptly created: a line of accessories for shutters that is trouble-free for both the window fitter and the end customer, because it cuts down on maintenance time and costs, is of absolute quality and lasts forever.
Hìnox is the first brand in the market to do this, and before anyone else. **Only Hìnox branded products are guaranteed and designed for this, beware of imitations.**

EUIPO
EUROPEAN UNION
INTELLECTUAL PROPERTY OFFICE

The Hìnox trademark is registered at European level with EUIPO, the European Union Intellectual Property Office.

FAQ
STAINLESS STEEL

01 ARE STAINLESS STEELS "ETERNAL"?

Let's put it this way: stainless steels contain chemical elements thanks to which a passivation film is generated that protects them from atmospheric agents. This does not correspond to the concept of durability "in aeternum" in the same conditions in which the material was found, for example, at the time of installation, but thanks to the ability of the protective passivation film to "self-heal", that is to recreate itself even if accidentally damaged, it can be affirmed that **with simple maintenance and a few small precautions, stainless steel products can actually last forever.**
So, although there is nothing in the world that does not require maintenance, stainless steel is definitely the material that gives you the least "worries".

02 WHY NOT USE SURFACE-TREATED FERRITIC (IRON) STEELS TO AVOID THE PROBLEM OF RUST?

If we think of a metal product made of non-stainless steel, commonly known as "iron", we must consider that, in order to avoid rusting, these steels are usually treated galvanically (galvanisation), or with other electrolytic treatments, or, again, in the most common way, with suitable coatings, above all polyester powder coating.
However, **once the rusting process has been triggered** - for a variety of reasons - **there is nothing that can really stop it on this type of artefact.** Consequently, even if the surface of the artefact has been adequately treated, sooner or later it will corrode and the protective film with which it has been treated will break down and the underlying rusting will emerge, affecting the artefact and, in the worst cases, making it completely unusable and aesthetically unpleasant.

03 HOW COULD THE PROTECTIVE PASSIVATION FILM GET DAMAGED?

The protective passivation film is a very thin surface layer, in the order of 0.3-5 nanometres (1 nanometre corresponds to 0.000001 millimetres!).
Any accidental impact could break this layer quite easily (a fall from a certain height or impact with a blunt object), however, the ability to "self-heal" and to restore its passivated layer (our protective film) allows the material to be quickly protected again from aggressive atmospheric agents, and all this within an average of about 48 hours.

"STAINLESS STEEL OXIDISES, BUT DOES NOT CORRODE IF MAINTAINED PROPERLY"

04 SO NO MAINTENANCE IS REQUIRED?

That is not correct. As has already been pointed out, there is no manufactured article in the world that does not need some kind of maintenance.
Stainless steel, with its ability to regenerate the passivated layer, that is its natural protective film, **has the great advantage of being self-maintaining and therefore limiting maintenance work as much as possible and/or making such work extremely simple compared to that which could be more demanding on products made from non-stainless steels**, where, in the presence of exposure to particularly aggressive atmospheric agents, in many cases it is not even possible to intervene.

05 MY BLACKSMITH INSTALLED A STAINLESS STEEL RAILING, BUT IT HAS RUSTED!

Although the installation of any item can cause problems for the item itself, regardless of the type and quality of the materials, it should be noted that there are many variations of stainless steel that meet specific requirements, dictated above all by the environment in which the item is installed.
Without going into too much detail, **we can say that steels with good corrosion resistance are normally considered to be those of the so-called "AISI 300" series, in particular AISI 304 and AISI 316**. It is therefore important to understand whether these types of steel have been chosen in the presence, for example, of geographical areas subject to high atmospheric salinity, otherwise all the efforts made to avoid the problem of rust may be in vain.

06 WHAT TYPE OF STAINLESS STEEL DOES DIDIEFFE USE FOR THE DEVELOPMENT OF ITS HARDWARE?

Since 2016, **Didieffe has focused on AISI 316 (the best quality of this steel, the so-called "L" type)**, overcoming the problem of the higher cost that until then had shifted the choice towards a slightly inferior steel such as 304L.
It is essential to stress that this policy is mainly due to dynamics linked to the quality of the raw material available on the market. Over the last few years, the "mesh" of international regulations (ISO standards, for example), which determined the degree of purity that stainless steel must have to be considered as belonging to one series rather than another, has become much wider, allowing even steels with inadequate chemical characteristics to become part of the 304 series.
In order to avoid the risk of supplying an inadequate product, which might not have the necessary characteristics for its purpose, it was decided to switch to the 316L series. By doing so and managing to reduce certain production costs - without passing on the higher cost of the raw material to the customer - we were able to offer a product that is, today, absolute excellence in the sector.
It should be remembered that the 316 (or 316L) series is particularly suitable for products in the marine industry (AISI 316 or 316L stainless steel is also known as "Marine grade") **where the finished product is in constant contact with the most extreme conditions.**

"STAINLESS STEEL IS ABLE TO REGENERATE ITS NATURAL PROTECTIVE FILM, AND THUS TO MAINTAIN ITSELF"

FAQ
ACCIAIO INOX

07 SO IS IT ENOUGH TO CHOOSE THE BEST TYPE OF STEEL TO BE ABLE TO MAKE THE BEST PERFORMING PRODUCT POSSIBLE?

Definitely not! If we were to make a comparison, we could ask ourselves: is it enough to choose the best ingredients to prepare a dish for a top restaurant? Of course not... **In addition to choosing the best possible materials, we need to understand the "drawbacks" behind the production process**. Stainless steel, like practically all metallic (and non-metallic) materials, is in fact susceptible to the processes carried out on it. The material is therefore "altered" during all processing: so it is sensitive to temperature, pressure, shear and so on.
The contribution of these work phases alters the molecular structure of the material itself and, if not properly treated, this can cause, even in the short term, unexpected and undesirable results in terms of performance.
Our certified production cycle includes a series of treatments to restore and optimise the molecular composition of the material.

08 I HAVE READ THAT, IN ORDER TO UNDERSTAND WHETHER GOOD QUALITY STAINLESS STEEL IS BEING USED, IT IS NECESSARY TO CHECK THAT A MAGNET DOES NOT STICK TO IT. IS THAT CORRECT?

Austenitic steels (AISI 304 and AISI 316, above all), are "a-magnetic", that is, in the annealed state (the state in which the material is machined) they are not permeated by magnetic fields, so if we were to take a piece of stainless steel which has not been machined in any way, a magnet would not stick to it.
However, there are many processes that are carried out on the material (think of cutting, bending or casting, if we are talking about geometrically complex components) and, in general, all plastic deformations give the artefact a certain level of magnetic permeability. **It is therefore not uncommon to observe that, especially in the vicinity of a bend or on a cast part, a magnet may tend to stick.**
This is certainly not to be taken as an indication of poor quality stainless steel. On the contrary, it should be pointed out that this test can often cause misunderstandings and misconceptions about the concept of material quality.

09 BESIDES CORROSION RESISTANCE, WHAT ARE THE OTHER ADVANTAGES OF USING STAINLESS STEEL HARDWARE?

Certainly the maintenance costs. These costs are the real focal point on which the choice between stainless steel and conventional steel (iron) hardware should be based.
In areas close to the sea, agents other than simple atmospheric humidity and rain (for example, salinity) exert an aggressive effect on metal materials.
In these areas, our decades of experience indicate an average service life of 8-10 months at the most for hardware in acceptable conditions, after which the surface treatments of conventional hardware in some cases suddenly become ineffective in protecting the item from corrosion.
Working on rusted hardware is often a dead-end job. Once rust has formed, it can initially be removed, but the deep corrosion process is irreversible. These items will rust again - and within a shorter period of time between maintenance - and this will lead to maintenance costs. The lower cost of traditional hardware at the time of purchase is therefore cancelled out by the maintenance costs of restoring the hardware within a few months.

10 MANY PEOPLE RECOMMEND STAINLESS STEEL HARDWARE: HOW CAN I CHOOSE THE RIGHT STAINLESS STEEL HARDWARE?

Didieffe has been producing its stainless steel hardware since 2002. A few years later, aware that the hardware market in general was becoming more and more interested in high-quality solutions, we decided to unify our entire range under one recognisable brand name.

Today, our **HÌNOX brand is a guarantee of a state-of-the-art production process for stainless steel, designed for the most "extreme" applications in terms of target atmospheric conditions.**

> "OUR CERTIFIED PRODUCTION CYCLE INCLUDES FUNCTIONAL TREATMENTS TO RESTORE THE MOLECULAR COMPOSITION OF THE STEEL"

FAQ
ACCIAIO INOX

11 I DO NOT THINK I NEED TO INSTALL STAINLESS STEEL HARDWARE BECAUSE THE SHUTTERS ARE NOT INSTALLED NEAR SEA AREAS: WHY SHOULD I CONSIDER STAINLESS STEEL ANYWAY?

It is indisputable that stainless steel finds its greatest significance in applications near marine areas. Of all the atmospheric agents that can affect any metal artefact, salinity (which is largely composed of sodium chloride, metal's enemy) is certainly the most dangerous.
However, if we consider a metal object that is not made of stainless steel, and we take it for granted that it is at least painted to protect it from rusting, we must take into account that, **even in areas that are not close to the sea, other environmental factors are at work.** One example is fine **dust or smog** in general in large cities. Atmospheric particles, which are made up of substances that we know to be highly polluting and harmful to health, also include chemical elements with corrosive properties (such as sulphur dioxide and nitrogen dioxide). **This dust is deposited on the hardware and, undoubtedly over a longer period of time than salinity, starts a process of destruction of the paint film covering the item**. Hence, the process of rusting of the underlying material is a matter of course.
There are also other **reasons related to environmental protection**, in fact, **stainless steel - unless specifically requested - does not require galvanising or painting treatments, which have an impact on the natural environment and is, to all intents and purposes, 100% recyclable**

12 I WOULD LIKE TO INSTALL STAINLESS STEEL HARDWARE, BUT I WOULD LIKE TO HAVE IT PAINTED TO MATCH THE COLOUR OF MY SHUTTERS: IS IT POSSIBLE?

Yes, indeed. As with iron hardware, all our stainless steel hardware can be painted in the same quality as always using standard industrial polyester powder coating.
Each shutter can therefore have the hardware in the desired RAL colour.

PRODUCTION CYCLE

STAINLESS STEEL

01 SELECTION AND CONTROL OF THE MATERIAL

It is important to check that the material supplied is indeed of the required quality. The incoming controls involve randomly checking the steel coils or castings with a chemical reagent that highlights the presence of molybdenum on the tested surface, a chemical element that is essential for defining the quality of stainless steel, which in our case is AISI 316.

02 DECONTAMINATION OF PRODUCTION EQUIPMENT

It is essential to avoid contamination. For this reason, as far as possible, when the equipment used for stainless steel production is not used exclusively for this purpose, it is "decontaminated" to remove any ferrous residues from previous processing before it is used for stainless steel production.

03 PRODUCTION

All production and storage stages, including temporary storage, are carried out with the utmost care to avoid possible further contamination. The production environments where stainless steel products are manufactured are as "isolated" as possible from the rest of the work stations, in order to prevent any impurities or waste from other processes coming into contact with the product being manufactured.

04 DECONTAMINATION OF THE PRODUCT

Once the work steps that shape the object being produced have been completed, we move on to make the piece completely free from possible further deposits of undesired material. This is done by means of chemical degreasing and pickling processes carried out with a special electrochemical cycle

05 SURFACE FINISH

The parts are now given the appearance they will have on delivery. This is done by means of tumbling processes using special ceramic inserts designed for the purpose The part is then smooth and shiny

06 PASSIVATION

The natural process that stainless steel would undergo in contact with oxygen is accelerated.
This drastically reduces the time during which the material is deprived of the "passivated" layer (which is torn as a result of the previous steps), the real barrier for stainless steel against atmospheric agents.

inox care kit

WHY PERFORM MAINTENANCE

USE OF THE HÌNOX CARE KIT

didieffe CARE PROGRAM

01 WHAT IS THE HÌNOX CARE KIT FOR

HÌNOX CARE KIT is a kit that can be used by both the specialist installer and the end user to maintain 300 series stainless steel products (AISI 303, AISI 304, AISI 316) in optimum condition.

The optimal conditions of a stainless steel product are those in which the aesthetic and functional characteristics of the product are preserved through correct, periodic maintenance. Maintenance operations using the Hìnox care kit are therefore aimed at avoiding generalised or localised oxidation phenomena on the products to be treated.
Among the most common types of oxidative phenomena, two in particular are worth mentioning, as they are often linked to cases of oxidation present on light articles such as hardware:

PITTING: which usually occurs on flat surfaces where the passivated layer has been compromised. It is characterised by dark brown speckling in areas where the passivated layer has been lost.
GALVANIC CORROSION: also known as "contamination", this occurs when a non-noble material comes into contact with a noble material such as stainless steel (e.g. if stainless steel hardware is attached using screws that are not made of stainless steel).

These are the two types of oxidation that the Hìnox care kit must defend against.

02 WHAT IS THE HÌNOX CARE KIT FOR

The kit consists of two different types of wet wipes and a spray.
This indicates that the complete maintenance cycle involves 3 STEPS.

THE FIRST WIPE (HÌ DX POWER) has a degreasing and deoxidising function (deep action on particularly oxidised items).

THE SECOND WIPE (HÌ DX NEUTRAL) is used to "neutralise" the surface treated with Hì DX POWER, that is to say to remove the residues of the first pass.

THE FINISHING SPRAY (HÌ FS1) is a spray that makes the surface shiny and has an antistatic function against weathering.

03 MAINTENANCE FREQUENCY

The maintenance frequency depends on the **environmental factors** to which the product is subjected.
If we assume that stainless steel hardware is mainly installed in areas with high atmospheric salinity (coastal areas), we must be aware that the **active role of the end user** of the shutters or windows is crucial in controlling the need for maintenance.
It is not possible to define fixed maintenance intervals, since, as mentioned above, this depends not only on the proximity to coastal areas, but also on other environmental and geographical factors (salinity of the water, the presence of winds blowing more or less constantly inland, and the direct exposure or otherwise of the shutters or windows to environmental agents).
T**he end user must therefore check the condition of the hardware** in order to decide whether and how to act on it.

04 WHICH MAINTENANCE?

ROUTINE MAINTENANCE:

If the end user plays an active role in checking the state of the hardware, the maintenance actions to be carried out can be kept to a minimum and will in no case require the intervention of a specialist technician. In fact, if the occurrence of major oxidation phenomena (such as pitting) is avoided by working more frequently, it is sufficient to clean the surface of the hardware in the same way as a hob or cooker at home. In this case the maintenance consists only of the use of the finishing spray (Hì FS1).
Based on experience and without denying the principle of the environmental differences that exist between different geographical areas, it can be said that a periodic four-monthly check of the hardware can only allow the use of a finishing spray and therefore act before the onset of any major oxidative phenomenon.

EXTRAORDINARY MAINTENANCE:

If the occurrence of oxidative phenomena is greater, the complete maintenance cycle with the Hinox care kit, that is the three-step cycle, must be carried out:

DEGREASING/DEOXIDISING (with the HÌ DX POWER wipe)
NEUTRALISING (with the HÌ DX NEUTRAL wipe)
FINISHING (with the HÌ FS1 spray)

In this case, we must be aware that we are acting on a situation that has been created gradually and not on a situation of sudden deterioration. In fact, one of the advantages of **stainless steel**, unlike painted steel products, is that it **gives us "warnings" of the start of the oxidation process** that are visible to the human eye (e.g. excessive dulling of the surface, start of the pitting phenomenon with very small specks) in a slow and gradual manner, **allowing us to take action to avoid more drastic situations.**

However, the great advantage of performing maintenance on stainless steel is that, whether it is carried out promptly or with a certain "delay", it is possible to obtain a virtuous result that restores the material to its optimal performance conditions, something that cannot be achieved on painted steel items.

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