Hauck Heat Treatment Eindhoven B.V.
Achtseweg Noord 5 | 5651 GG | Eindhoven | The Netherlands
Phone: + 31 (0) 40 266 30 00 | info.eindhoven@hauckht.com
www.hauckht.nl/eindhoven | www.stainihard.com

Stainihard® NC

Technical Recommendations

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Technical Recommendations Stainihard®

Please observe the following points for treating your product(s) with the best possible Stainihard® result. We also recommend for new application to take contact with our engineers.

STAINIHARD®

Stainihard® is a process for hardening the surface of austenitic and duplex stainless steel. The process is based on classic gas nitro carburizing. At Stainihard®, the surface is enriched with nitrogen and carbon to improve the mechanical properties of the product. With Stainihard® the abrasive/adhesive wear, anti-galling and fatigue characteristics improve without affecting the corrosion resistance. The product also remains virtually unchanged in size, shape and color. Stainihard® can be applied to austenitic and duplex stainless steel. In certain cases it is also possible to treat other types of stainless steel. Please contact us if you are in doubt whether your material is suitable. In the Stainihard® process a diffusion layer builds up over the entire component, including drill holes, crevices and/or screw threads.

Products must be delivered clean, metallic bright, free of oxidation and grease. Also there should be no (remains of) glue, paint, cooling lubricants or other foreign substances present. A product to be treated shall not contain closed voids. With regard to layer depth, base material and surface condition play a major role and they also greatly influence the corrosion resistance of the final product.

Some examples of 'dissonance', which in stainless steel materials can occur and which play a role in the final result to be achieved, are discussed below:

MATERIAL PROPERTIES

Structure
In the structure delta ferrite can be present. This limits the corrosion resistance as well as the formation of the Stainihard layer. Delta ferrite cannot affected by any heat treatment. If no delta ferrite is desired, then a different stainless steel material quality should be selected.

Alloy Elements
It is always recommended to buy solution annealed material and define the maximum ferrite ratio with your order. In stabilized stainless steel types (e.g. with titanium or niobium) an increased ferrite percentage can be present in the structure, which can lead to reduced corrosion resistance. Although Stainihard® is a color stable process, in stabilized stainless steel types the alloy element titanium may cause discoloration of the surface. The so-called 'automation' stainless steel types are alloyed with sulfur and/or phosphorous. These sulfides provide a more limited corrosion resistance. In addition, these kinds of steel exhibit downgrade surface conditions and also have influence on the Stainihard layer.

Compositions
If your product is a welding or solder construction, then the various sub-components must be made out of the same material or material group (for example 304/316) However, if parts are made from different materials (e.g. duplex steel with a Ni-base alloy), then the treatment can cause deteriorated corrosion resistance. Any welded joints must be free from slag remains, oxidation, inclusions and/or inhomogeneous structures.

Brazed products can only be brazed with Ni-base braze material.

Casting Qualities
Functional surfaces in cast parts must be free of casting skin and inclusions. Cast parts/castings must always be solution annealed in advance.

Dimensional Changes
Although Stainihard® is a size and form-stable treatment, previously existing stress, such as residual stress due to rolling, bending and machining can cause dimensional changes. If there are in your product very tight tolerances, then it is highly recommended that you first consult one of our engineers.

SURFACE QUALITY / PRODUCT PROPERTIES

By deformation (partly) deformation martensite and/or secretions can be formed, which can cause a negative impact on the final results. Deformation martensite is best prevented by a solution annealing prior to Stainihard®.
Blast-cleaned, grinded, brushed, polished and other mechanically machined surfaces can have remains of abrasives, emulsions, grease and/or other auxiliary materials, which can negatively affect the end result. Therefore, as the last operation before Stainihard®, pickling or electrolytic polishing of the component is recommended.

Finally, the accessible surface hardness and diffusion depth depends on the selected type of material, the material quality and the surface conditions. Desired values on drawings, orders and other documents with respect to hardness and depth are, from the above point of view, only conditionally attainable.

DELIVERY CONDITIONS AND DOCUMENTS

In order to prevent any damage during transport the packaging must be solid, stable, and (re)usable for the return shipment. Sharp edges must be protected and you must inform us in this respect (danger of injuries). Heavy parts must be fitted with lifting capabilities (e.g. threaded holes for lifting eyes). Composite components must be supplied disassembled, as individual parts.

Your items must be accompanied by a packing list, purchase order and technical drawing, which clearly state the quantity, type of material, item description, item number and/or drawing number and, if available or known, our quotation number and selected treatment. Also other documents and specifications which are relevant for the treatment, particularly for items destined for the automotive and aerospace industries, must always be included.

All orders for deliveries and/or services to be carried out by us are subject to the general Hauck HT Eindhoven BV working standard F3.010.01 as well as the general conditions of sale and delivery of Hauck HT Eindhoven BV filed with the Chamber of Commerce Eindhoven. A copy of these terms and conditions is attached. Conditions to the contrary are expressly rejected.