

SURFACE TREATMENT**CHROMIUM NITRIDING****DSF 1.4.2****Definition:**

CrN (chromium nitride) coating provides lubricity and superior wear and corrosion resistance. This combined with the very low residual stress provides for the best adhesion and ductility of any of the Physical Vapour Deposition (PVD) coatings.

High hardness, low coefficient of friction and the low residual stress of this process combine to resist abrasive, metal-on metal wear and galling. It provides an excellent coating for applications such as automotive parts, moulds & dies, pump parts & shafts, working especially well against copper.

Treatment Information:

The Engineering Drawing must define the areas that require treatment. A fine ground finish is recommended to ensure that the surface roughness is less than the coating thickness.

Substrate materials must be compatible with high vacuum conditions at elevated temperatures and have a surface free of oxidation & contaminants to ensure a successful metallurgical bond to the coating. Functional areas should be free of burs and overlapped material caused by aggressive grinding. These imperfections may coat and then break off.

The entire part will be placed inside the vacuum chamber therefore masked uncoated areas must also be compatible.

Note: parts must be held during the process so it is not possible to "coat all over" without leaving any kind of fixture mark.

Nitrided and Carburized surfaces can be coated. This additional case hardness at the surface can help provide a key for the coating.

Appearance:

The finished article shall be free from visible treatment defects such as blisters, pits or un-plated areas.

The coating will be smooth and adherent, clean and free from damage.

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Description:

A Chromium Nitride coating is applied using Physical Vapour Deposition (PVD), which is a vaporisation coating technique involving the transfer of a material at an atomic level.

In a vacuum furnace, the high purity solid coating material is evaporated either by heat (cathodic arc) or by bombardment with ions. The standard process temperature is 400°C and provides the toughest coating. The lowest possible deposition temperature is 220°C.

A reactive gas (containing carbon) is introduced forming a compound with the metal vapour & deposited on the substrate as a thin highly adherent coating. Typically 1µm- 5µm thick.

Properties:

- A dense, smooth silver grey thin film coating.
- Offers very good wear resistance.
- Uniform coating that follows surface contours. See **Note**
- Environmental friendly alternative to electroplating.
- Chemical resistant.
- Heat resistant.
- Increased hardness.
- Corrosion Resistant.

ASM (DEK) Applications:

Applied to high precision metal components, without the need for re-machining that require a very hard, ≥80 Rc (twice as hard as chrome plating) abrasive resistant coating combined with reduced friction & enhanced oxidation resistance.

Note: This is a 'line of sight' technique, coating undercuts is difficult.

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