

## Corr-I-Dur®

**Bodycote's Corr-I-Dur® process not only enhances wear properties, but also significantly improves corrosion resistance...**

**Thanks to the wide range of applications, nitriding and nitrocarburising processes are becoming more and more important. In addition to mechanical and technological characteristics, corrosion resistance is of vital importance for the functionality of surfaces.**

■ **The 'dry' process:**

Nitriding and nitrocarburising carried out in the Corr-I-Dur® process is a combination of various thermo-chemical process steps, i.e. gas nitrocarburising and oxidising. Wear and corrosion resistant layers are created which show a dark grey to black colour. the Corr-I-Dur® process is a 'dry' process and therefore does not rely on oil or wax being applied to the part, to improve corrosion resistance.

■ **The application:**

The application ranges from single components to production volumes, including a wide range of materials such as unalloyed construction and case hardened steels, quenched and tempered steel can also be treated. For many components from the automotive and hydraulics industries, engineering and mining industries, Corr-I-Dur® is an alternative to salt bath nitriding with oxidation.

■ **Pre and post treatment:**

At delivery, parts should be metallic blank and free of contamination or residues. Normally the components are already in their final shape before the heat treatment, additional grinding or polishing to reduce roughness after heat treatment is possible and should be discussed prior to treatment.

■ **Distortion and dimensional changes:**

Corr-I-Dur® has very little effect on distortion and dimensional changes of components. Compared to carburising and carbonitriding, dimensional changes are significantly lower. Dimensional changes

can further be positively influenced by varying the process parameter, e.g. temperature. Due to the creation of a compound layer dimensional changes occur. These changes can be precompensated during the prior production process.

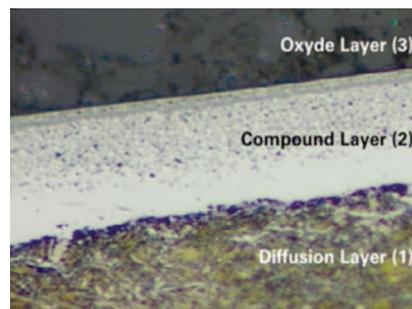
In our Gebze Plant, the Corr-I-Dur furnace have 1500 kg capacity and 900 x 900 x 1200 mm dimensions.

■ **Corrosion resistance:**

The final corrosion resistance of components depends on various factors: material, roughness, surface contamination and dimensions. Cooperation between the customer and Bodycote prior to heat treatment leads to optimum results. Standart corrosion requirements of most materials (>96h in the ASTM B 117 salt spray test) is exceeded and Corr-I-Dur® is an environmentally friendly alternative to galvanic layers.

■ **Compound layer and diffusion zone:**

By diffusion of elementary carbon and nitrogen into the surface, a diffusion zone and a compound layer are created. The components are then oxidized and a compact oxide layer is created which is mainly responsible for the corrosion resistance. The compound layer determines the component's wear properties, while the diffusion zone influences the mechanical properties.



**Corrosion Resistance**  
Thickness OS 1-2 µm

**Wear Resistance**  
Sublayer for Oxide Layer  
Thickness VS > 15 µm

**Fatigue Strength**  
Bending Fatigue Strength

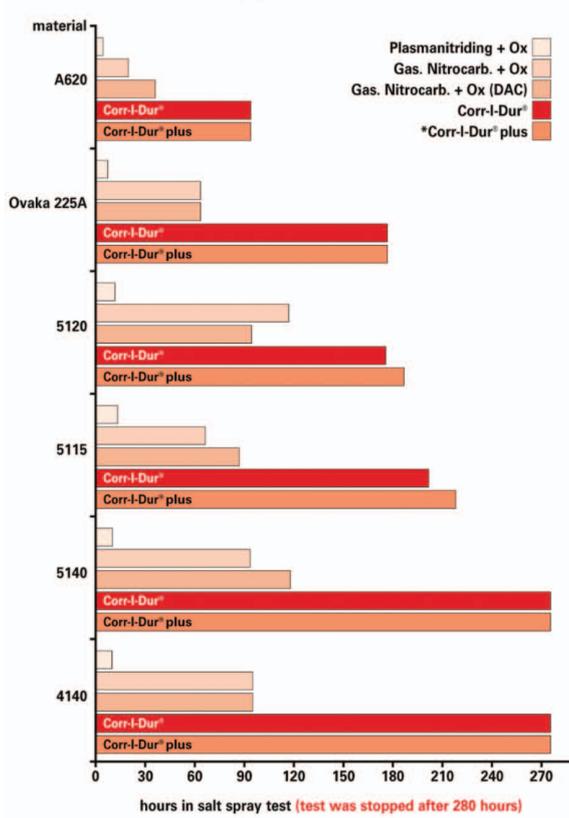


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### ■ Surface hardness and nitriding depth:

The achievable surface hardness mainly depends on the base material. Alloying elements such as chrome and aluminium lead to higher hardness. The nitriding depth depends on customer requirements and also the component's condition at delivery, i.e. distortion, can affect the layer parameter to be achieved.

A comparison of corrosion resistance of dry nitrocarburising processes



\* Corr-I-Dur® plus is a post oxidation polishing finish

