

NITRIDING STEELS:

These are hardening and tempering steels (Carbon = 0.30% / 0.40%) containing alloys such as Al, Cr, Mo and V, able to form particularly hard nitrides; they are intended for the fabrication of mechanical parts on which, once finished, a nitriding thermal treatment is carried out, i.e. surface hardening through absorption of nitrogen, and which are then used directly in service without other machining except for precision finishing of active surfaces (grinding and smoothing). The core maintains the essential strength and toughness properties of a hardened and tempered steel while very high (750/1200 HV) surface hardness values can be obtained such as to guarantee a much higher wear strength and resistance to sticking than casehardened and hardened steels. However, casehardening makes it possible to support higher specific loads as the surface thickness indicated (1-2 mm) is usually higher than that which can be obtained through nitriding (0,6 mm). A nitriding depth ≤ 0.25 mm may be sufficient for parts subject mainly to wear stress whereas deeper nitriding must be used for parts that are more exposed to fatigue or higher specific loads. Compared with normal structural steels, nitrated steels feature improved resistance to corrosion by damp air, soft water, sea water, high temperature steam. The nitriding process follows the hardening and tempering treatment and mechanical finishing and is carried out at temperatures (around 520 °C) that are at least 30 °C below the tempering temperature, with the advantage of avoiding any danger of distortion due to thermal shocks as happens in the casehardening and hardening process.