

HIGH TEMPERATURE CASE-HARDENING STEEL



Setforge



PRODUCTIVITY

Surface treatment by case-hardening time divided by two.



EFFICIENCY

In line with new environmental requirements thanks to a better energy efficiency.



OPTIMISATION

Finished parts less expensive due to the case-hardening optimisation.

High temperature case-hardening steels allow to optimize surface treatment cycle by case-hardening, by increasing the treatment temperature to reduce the time, while maintaining the required grain size. The better control of the cycle results in an increased productivity and cost reduction while being in line with the evolution of environmental requirements

This option can be considered for any mechanical parts that are surface treated by case-hardening.

Prerequisite

COMPATIBLE FURNACES WITH HIGH TEMPERATURE CASE-HARDENING

High temperature case-hardening steels are particularly suitable for components with a fine granular structure such as gears and other transmission components in automotive industry.



Gears for automotive and trucks industry, forged and machined.



EXISTING SOLUTIONS ON THE MARKET

Setforge is working in close collaboration with **the most innovative steelmakers on the market to develop the solutions of tomorrow**. Our purchasing and engineering teams are at your disposal in order to assess the potential metallurgical and economic gains of these solutions for your business.



Steel range JOMASCO 23mod

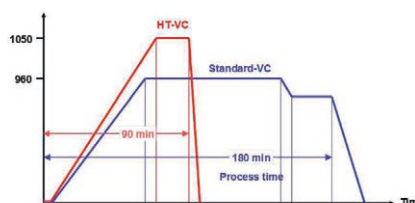
Extract from Ascometal documentation



« +GS » (Grain Stable): a range of standard carburizing steels adapted to high temperature vacuum carburizing (up to 1050 °C):

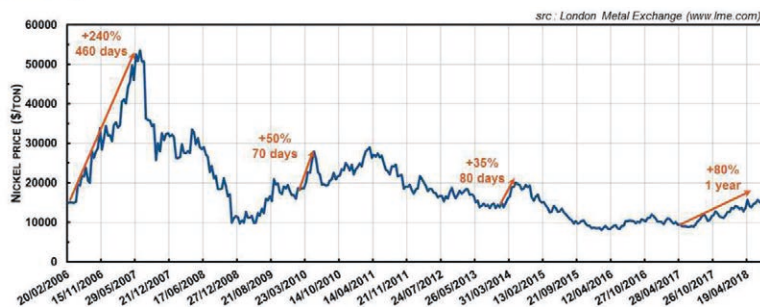
- Reduced quenching distortions
- Shorter carburizing cycle times

« TS » (Tool Safe): a range of cleanliness steels adapted to pitting



Jomasco23mod: a Ni-free substitution to 18CrNiMo7-6

- Proven 'hassle-free' solution: same performance, no need to alter carburizing process
- No exposure to Ni fluctuating costs



Steel range NANOCEM

Extract from Sidenor documentation

Case hardening steels that guarantee a fine grained structure

APPLICATION

- Components that require a **fine grain structure** after carburisation.
- High temperature carburisation on vacuum or conventional furnaces.
- Components with **increased hardened case depth**.

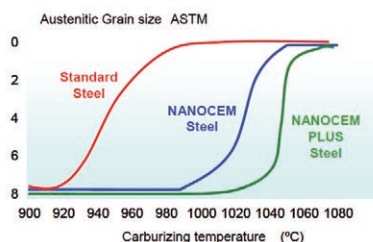


ADVANTAGES

High temperature carburising	Shorten the treatment time	Increased case depth	Costs reduction
Chance to increase the carburising temperature maintaining a fine grain structure.	The high temperature speeds up the carbon diffusion in the austenite and this shortens the process.	The higher diffusion rate allows obtaining a deeper case, maintaining the component quality.	Increased productivity and less quality problems.

Applied Technologies

- Micro-alloying addition of elements such as **Al, N, Nb or Ti** that form **nano-precipitates** (20-40nm), stable at the treatment temperature and able to inhibit the austenitic grain boundaries displacement



- **Conventional carburising (T<980°C) (NANOCEM)**: with balanced Al & N additions and controlled material processing
- **High Temperature Carburizing (T>1000°C) (NANOCEM PLUS)**: Microalloying with Nb and Ti additions, allows to increase the treatment temperature up to 1050°C.



Approforge

FOCUS ON INNOVATION

APPROFORGE, purchasing specialist of raw materials for Setforge Group, one of the leading group in Europe in the production of forged components, has set-up a co-development team to provide innovative solutions to their customers in order to bring them a competitive advantage by reducing the overall cost of acquisition of their parts.

Ask for more : innovation.approforge@setforge.net