

# ENGINEERING STEELS - CASE HARDENING STEELS

## Application Segments

Automotive

## Available Product Variants

Long Products

## Product Description

BÖHLER M121 ISOPLAST is a remelted nickel-chromium-molybdenum case-hardening steel for components with increased requirements for toughness and core strength.

## Process Melting

Airmelted + Remelted

## Properties

- > Toughness & Ductility : very high
- > Wear Resistance : high
- > English (United Kingdom) : very high
- > Polishability : high
- > Micro-cleanliness : high

## Applications

> Motorsport industry

> Automotive

## Technical data

| Material designation |     |
|----------------------|-----|
| ~1.6657              | SEL |
| ~14NiCrMo13-4        | EN  |
| ~EN36C               | BS  |

## Chemical composition (wt. %)

| C    | Si   | Mn   | Cr  | Mo   | Ni   |
|------|------|------|-----|------|------|
| 0.14 | 0.28 | 0.55 | 0.9 | 0.13 | 3.15 |

## Delivery condition

### Normalized, Tempered

|               |          |
|---------------|----------|
| Hardness (HB) | max. 255 |
|---------------|----------|

## Heat treatment

### Case hardening

|             |               |  |
|-------------|---------------|--|
| Temperature | 880 to 980 °C | For case hardening in the given temperature range, carburise (usually below 950°C [1.742°F]) and quench / oil, (water), hot bath (160 - 250°C [320 - 482°F] ), air. Quenching in water generally only for large parts of simple mould. Achievable surface hardness after case hardening: min. 59 HRC |
|-------------|---------------|--|

### Hardening and Tempering

|             |               |  |
|-------------|---------------|--|
| Temperature | 840 to 880 °C | For core hardening, heat and quench the material / oil, (water), hot bath (160 - 250°C [320 - 482°F]). |
| Temperature | 150 to 200 °C | Tempering treatment: Single tempering.   |

## Physical Properties

| Temperature (°C)   | 20   |
|--|------|
| Density (kg/dm <sup>3</sup> )                              | 7.85 |
| Thermal conductivity (W/(m.K))                             | 34   |
| Specific heat (kJ/kg K)                                    | 0.46 |
| Spec. electrical resistance (Ohm.mm <sup>2</sup> /m)       | 0.2  |
| Modulus of elasticity (10 <sup>3</sup> N/mm <sup>2</sup> ) | 210  |

## Thermal Expansions between 20°C | 68°F and ...

| Temperature (°C)                             | 100  | 200  | 300  | 400  | 500  | 600  | 700  |
|--|------|------|------|------|------|------|------|
| Thermal expansion (10 <sup>-6</sup> m/(m.K)) | 11.1 | 12.1 | 12.9 | 13.5 | 13.9 | 14.1 | 14.2 |

If other available product variants are listed in addition to long products, please note that these may differ in terms of melting process, technical data, delivery and surface condition as well as available product dimensions. For mandatory technical specifications, other requirements and dimensions, please contact our regional voestalpine BÖHLER sales companies. The data contained in this brochure is merely for general information and therefore shall not be binding on the company. We may be bound only through a contract explicitly stipulating such data as binding. Measurement data are laboratory values and can deviate from practical analyses. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer.