



EC-80

Alloyed Structural Steel

Distinctive feature & main attribute

An alloyed, low carbon, cementation steel with ferro-pearlite structure, suitable for case carburizing and calcium treated for inclusion modification. It is easily hot machinable and weldable with tightly controlled hardenability and therefore it can show good core features. For parts with a required core tensile strength and good wearing resistance.

Use & application range

This quality is adapted for gear wheels and camshafts, levers, joints, gibs and piston bolts or all pieces of machine construction and mechanical engineering components.

Material No. and norms

| | |
|------------------|-------------|
| Material No. | 1.7139 |
| DIN Abbreviation | 16MnCrS5 |
| AFNOR | 16MnCrS5 |
| AISI/SAE/ASTM | AISI ~ 5115 |
| ISO | 16MnCrS5 |
| Euro Standard EN | 16MnCrS5 |
| Others | |

Reference analysis

| | C | Si | Mn | P | S | Cr | Fe |
|---|------|------|------|-------|------|------|---------|
| % | 0.14 | max. | 1.00 | max. | 0.02 | 0.80 | balance |
| | 0.19 | 0.40 | 1.30 | 0.035 | 0.04 | 1.10 | |

Execution, delivery form, standard sizes and availability

- Execution in 3 m (2 m) round bars as well as coils
- Standard size in stock: [see Product range](#)
- Other sizes on request

Tolerances

- $\varnothing < 3.00$ mm, cold drawn, polished; ISO h9
- $\varnothing \geq 3.00$ mm, cold drawn, ground; ISO h8, surface finish N5/N6
- Tighter tolerances (up to +/- 0.002 mm) on request

Mechanical properties

At delivery status:

- Tensile strength (Rm): 490 – 680 MPa
- Hardness after tempering: ~ 45 HRC

Heat treatment

- Core hardening: tempered in water at 850 – 880°C, quenched in water
- Surface hardening: tempered in water at 810 – 840°C
- Case hardening: tempered in water at 900 – 950°C
- Chilling: 160 – 250°C
- Annealing: 170 – 210°C, cooling in air

Cutting rates

vc ~ 30 – 50 m/min, value depending on the lubrication oil, cutting tools and shape of parts.