



EC-80

Alloyed structural steel

Distinctive feature and main attributes

Unalloyed, low carbon, casehardening steel with ferro-pearlite structure, suitable for case carburizing and calcium treated for inclusion modification. It is easily machinable and weldable, with tightly controlled hardenability and therefore it can show good core features.

Use and 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.

Norms

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

Chemical composition [% wt]

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

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

$V_c \sim 30 - 50$ m/min, value depending on the lubrication oil, cutting tools and shape of parts.