



## EC-80

### Alloyed Structural Steel

Material No.	DIN Abbreviation	AFNOR	AISI/SAE/ASTM	ISO	Euro Standard EN	Others
1.7139	16MnCrS5	16MnCrS5 (former 16 M C 5)	AISI ~ 5115	16MnCrS5	16MnCrS5	

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.

REFERENCE ANALYSIS %	C	Si	Mn	P	S	Cr	Fe
	<b>0.14</b> <b>0.19</b>	<b>max.</b> <b>0.40</b>	<b>1.00</b> <b>1.30</b>	<b>max.</b> <b>0.035</b>	<b>0.02</b> <b>0.04</b>	<b>0.80</b> <b>1.10</b>	<b>balance</b>

EXECUTION DELIVERY FORM STANDARD SIZES AVAILABILITY	<ul style="list-style-type: none"> <li>• Execution in 3 m (2 m) round bars as well as in coils</li> <li>• Standard size in stock: see <a href="#">Product range</a></li> <li>• Other sizes on request</li> </ul>
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TOLERANCES	<ul style="list-style-type: none"> <li>• <math>\varnothing &lt; 3.00</math> mm, cold drawn, polished; ISO <b>h9</b></li> <li>• <math>\varnothing \geq 3.00</math> mm, cold drawn, ground; ISO <b>h8</b>, surface finish N5/N6</li> <li>• Tighter tolerances (up to +/- 0.002 mm) on request</li> </ul>
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MECHANICAL PROPERTIES	At delivery status: <ul style="list-style-type: none"> <li>• Tensile strength (<math>R_m</math>): <b>490 – 680 MPa</b></li> <li>• Hardness after tempering: <b>~ 45 HRC</b></li> </ul>
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HEAT TREATMENT	<ul style="list-style-type: none"> <li>• Core hardening: tempered in water at 850 – 880 °C, quenched in water</li> <li>• Surface hardening: tempered in water at 810 – 840 °C</li> <li>• Case hardening: tempered in water at 900 – 950 °C</li> <li>• Chilling: 160 – 250 °C</li> <li>• Annealing: 170 – 210 °C, cooling in air</li> </ul>
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CUTTING RATES	<ul style="list-style-type: none"> <li>• <math>v_c \sim 30 - 50</math> m/min, value depending on the lubrication oil, cutting tools and shape of parts.</li> <li>• Cutting oil: e.g. INOX or ORTHO of Motorex</li> </ul>
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