

Material Grade: **16MnCr5**  
 Material Condition(s): **Untreated**  
 Surface Finish: **As rolled**

Associated Standard: **BS EN 10084**

Description:

Case hardening steel used extensively for both carburising and carbonitriding, demonstrating reasonably high hardenability and excellent forgeability. This grade is also has excellent weldability, however care should be taken to avoid weld cracking. Machinability is approximately 80% that of mild steel.

Typical applications: **Gears, pins, shafts, camshafts, drive wheels, clutch plates**

Typical conditions: **no designation or +U - as rolled**  
**+A - soft annealed**  
**+N - normalised**  
**+TH - treated to specific hardness range**  
**+H - with additional hardenability test**  
**+HH - with enhanced hardenability test**

**1. STEELMAKING**

	<u>C</u>	<u>Si</u>	<u>Mn</u>	<u>S*</u>	<u>P</u>	<u>Cr</u>
Min	0.14		1.00			0.80
Max	0.19	0.40	1.30	0.035	0.025	1.10

(\* grade variation 16MnCr5S has S range of 0.020-0.040%)

**2. MECHANICAL PROPERTIES**

Test type		Tensile and hardness test (at room temperature)					
		Yield (Re)	0.2 % proof	UTS (Rm)	Elong (A)	R of A (Z)	Hardness
Variation	Unit	N/mm <sup>2</sup>	N/mm <sup>2</sup>	N/mm <sup>2</sup>	%	%	HB
16MnCr5 + A	Min						
	Max						207
16MnCr5 + N	Min						138
	Max						187

**3. TYPICAL JOMINY HARDENABILITY - grade 16MnCr5+H**

Jominy reported in 1/16"

	<u>1.5</u>	<u>3</u>	<u>5</u>	<u>7</u>	<u>9</u>	<u>11</u>	<u>13</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>	<u>40</u>
HRC max	47	46	44	41	39	37	35	33	31	30	29	28	27
HRC min	39	36	31	28	24	21							