

USACUT 55

Colour Code
White/Magenta

1½% Manganese Molybdenum Freecutting Steel

Chemical Analysis

	Carbon	Manganese	Silicon	Sulphur	Phosphorus	Molybdenum
% Min	0.38	1.50	-	0.25	-	0.25
% Max	0.43	1.75	0.25	0.30	0.040	0.35

USACUT 55 is a specification that is not part of any British or European Steel Standard. It is, however, similar in analysis to steel specification BS970:1991 606M36 but with a higher sulphur content to give superior machinability.

Characteristics

USACUT 55 is a manganese molybdenum alloy steel that combines high tensile strength and excellent machinability. The carbon content is controlled within close limits so that it is suitable for induction hardening to HRC 55 min. It is supplied in the hardened and tempered condition within the tensile range 700 – 1000 MPa depending on the ruling section of the bar.

Round and hexagon sections are supplied to meet the requirements of Surface Quality Class 2, BS EN 10277-1.

Typical Applications

Suitable for a wide range of engineering products requiring an alloy steel where excellent machinability and improved surface finish are important, e.g. wheel studs, bolts, hydraulic components, machine parts, shafts and spindles, etc...

Form of Supply

Bright Bars : Hardened and tempered condition.

Machinability

The addition of sulphur to a manganese molybdenum alloy steel leads to the formation of manganese sulphide particles. The particles are insoluble in both liquid and solid steel and therefore become non-metallic inclusions dispersed throughout the steel microstructure. On machining, when the cutting tool encounters a sulphide inclusion the swarf will break due to the inherent weakness of the inclusion, which also acts as a lubricant reducing the temperature at the cutting tip. Both of these effects improve machinability, giving longer tool life and improved surface finish of the component. Special attention is paid to the control of sulphur in USACUT 55 to ensure the optimum volume, morphology and distribution of the manganese sulphide inclusions.

Mechanical Properties

Condition	Size range or LRS mm	Tensile Strength MPa	Yield Strength MPa min	Elongation % min	Izod Impact J min.	Hardness HB
Hardened & tempered.	R > 75	700 - 850	540	11	41	201 - 255
	S >45 <=75	775 - 925	620	10	34	223 - 277
	T <=45	850 - 1000	730	8	34	248 - 302

Stock Sizes

The sizes listed below are normally available from stock, other sizes can be supplied to customer requirements.

BRIGHT ROUNDS							inches diameter		
5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/16
1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	2	2 1/4	2 1/2	2 3/4
3	3 1/2	4							

BRIGHT ROUNDS							millimetres diameter		
10	12	15	16	18	20	24	25	30	35
40	45	50	60						

BRIGHT HEXAGONS							inches A/F		
0.500	0.525	0.562	0.600	0.625	0.750	0.812	0.820	0.937	1.010
1.100	1.125	1.300	1.500	2.220					

BRIGHT HEXAGONS							millimetres A/F		
13	17	19	22	24	30	32	36	41	50