LEOSCOR ALLOYS
ISO 9001, ISO 14001, OHSAS 18001 CERTIFIED Co.

Email: info@leoscoralloys.com
Phone: +91 22 23867540
www.leoscoralloys.com

AISI 1045 CARBON STEEL ROUND BAR SPECIFICATIONS

GENERAL CHARACTERISTICS

Carbon steel with medium tensile strength and poor hardenability, 1045 is often supplied in black hot rolled form, however rarely is it also available normalised. In either condition, they have a typical Brinell hardness range of 170–210 and a tensile strength range of 570–700 MPA. It is characterised by acceptable machinability, reasonable weldability, and reasonably good strength and impact qualities when hot rolled or normalised. Sections up to around 60 mm are often indicated as only being appropriate for through hardening and tempering since 1045 has a low through hardening capability.

However, depending on the quenching medium used, the type of setup, the section size, etc., it can be successfully flame or induction hardened in the as rolled or normalised form, producing surface hardnesses of up to RC 54–RC 60. However, due to a lack of appropriate alloying components, it does not respond to nitriding satisfactorily. All industrial sectors frequently employ *AISI 1045 Carbon Steel Round Bar* for applications that demand for more strength and wear resistance than low carbon mild steels can offer, for which the higher strength of low alloy high tensile steels is not required, as well as for applications that demand for flame or induction hardening.

AISI 1045 CARBON STEEL ROUND BAR CHEMICAL COMPOSITION

Designation		%C	%Si	%Mn	%S	%P	%Cr	%Cu	%Ni
AISI 1045	Min	0.43	0.10	0.60	--	--	--	--	--
	Max	0.50	0.35	0.90	0.035	0.035	0.25	0.25	0.30

AISI 1045 CARBON STEEL ROUND BAR PHYSICAL PROPERTIES

Designation	Modulus of Elasticity (PSI)	Coefficient of Thermal Expansion (^{0}F)	Thermal Conductivity (Btu/ft hr ˚F)	Specific Heat (Btu/lb ˚F)	Electrical Resistivity (Ωin)
AISI 1045	$29x10^6$	$6.39x10^{-6}$	30	0.116	6.42

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MECHANICAL PROPERTIES OF AISI 1045 CARBON STEEL

Size (mm)	Tensile Strength (MPA)	Yield Strength (MPA)	Elongation (%)	Hardness (HB)
≤ 16	700-850	≥ 500	≥ 14	210 - 245
17 - 40	650 – 800	≥ 430	≥ 16	195 - 235
41 - 100	630 – 780	≥ 370	≥ 17	185 - 230

AISI 1045 CARBON STEEL ROUND BARS FORGING

Pre-heat between 750 and 800 degrees Celsius, then raise the temperature to between 1100 and 1200 degrees Celsius at most. Once the temperature is consistent throughout the section, start forging right away. Do not forge below 850 degrees Celsius. Finished forgings may be air cooled.

MACHINING OF AISI 1045 CARBON STEEL ROUND BARS

Hot rolled and normalised 1045 has excellent machinability, making it possible to successfully complete all operations such as sawing, turning, drilling, broaching, milling, and tapping by following the instructions of the machine maker for the right tool type, feeds, and speeds.

WELDING PROCESS OF AISI 1045 CARBON STEEL ROUND BARS

With the proper technique, 1045 is easily weldable in its rolled and normalised condition. After welding, the work piece should, if possible, be stressed eased at 550 °C to 660 °C after cooling to hand warm. It is not advised to weld in the hardened and tempered, flame, or induction hardened conditions.

For more details visit: AISI 1045 Carbon Steel Round Bar Exporter

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