

Laboratory **Universal Precision Screws, NH-10, Delhi Road, Kharawar By-Pass, Rohtak, Haryana**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-5617** Page 1 of 2

Validity **08.05.2017 to 07.05.2019** Last Amended on --

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
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### MECHANICAL TESTING

I.	<b>MECHANICAL PROPERTIES OF METALS</b>			
1.	<b>Metallic Material (Raw Material-plain carbon, low &amp; medium alloy steel, stainless steel), (Bolt, Screw and Stud - Machined Test Piece)</b>	<b>Tensile Test</b> Tensile Strength, 0.2% Proof Stress, Yield Strength, % Elongation, % Reduction Area	ISO 6892 ISO 898, ASTM A370 ASTM F606/F606M ASTM E8/E8M IS 1608: SAE J429	10 to 2000 kN Load,  2 to 80% 5 to 80%
		Charpy Impact Test (V-notch)	ISO 148-1	2 to 240 J, at 23±5°C and at -20°C
2.	<b>Bolt, Screw and Stud - Full Size</b>	Tensile Strength, Wedge Tensile Strength, Proof Load	ISO 898-1 ASTM A370 ASTM F606/F606M SAE J429	10 to 2000 kN Load (Size M5 to M39)  (Qualitative)
3.	<b>Nut</b>	Proof Load	ISO 898-2 ASTM A370	10 to 2000 kN Load (Qualitative) (Size M4 to M39 Coarse & Fine)
4.	<b>Metallic Material (Raw Material-plain carbon, low / medium alloy steel, stainless steel), (Bolt, Screw, Stud and Nut)</b>	Rockwell Hardness	ISO 6508-1 ASTM E18 ASTM A370 IS1586-1 SAE J417	20 to 88 HRA, 20 to 100 HRBW, 20 to 70 HRC
		Vickers Hardness and Micro Vicker Hardness	ISO 6507-1 IS 1501-1 ASTM E92-16, E384-16 SAE J417	200 to 800 HV10, 200 to 800 HV30, 100 to 800 HV0.3, 100 to 800 HV1.0
II.	<b>METALLOGRAPHY TEST</b>			
1.	<b>Metallic Material (Raw Material-plain carbon, low /</b>	Macrostructure	ASTM E340 ASTM E381	Visual/10X (Qualitative)

**Venugopal. C**  
Convenor

**N. Venkateswaran**  
Program Director

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	medium alloy steel, stainless steel)	Average Grain Size	ASTM E112 IS 4748 (Comparison Method)	ASTM GS No.1 to 8 (at 100X) Qualitative
		Inclusion Rating	ASTM E45 IS 4163 ISO 4967	Type A, B, C, D Thin & Heavy, Rating 0.5 to 3.
2.	Metallic Material (Raw Material-plain carbon, low / medium alloy steel), (Bolt, Screw, Stud, Steel products)	Microstructure	ASM Handbook Vol.2 ASTM E407	50x-1000x (Qualitative)
		Depth of decarburization (Microscopic Method)	ISO 3887 ISO 898-1 ASTM E1077 SAE J419 IS 6396	0.01 to 1.0 mm @100X
3.	Case Hardened Steel Part	Case Depth (Micro-Hardness Method)	SAE J423 IS 6416	0.1 to 3.0 mm, HV0.3, HV1 (Qualitative)
4	Hardened Bolt, Screw, Stud and Nut	Characterization of Decarburization and Carburization	ASTM F2328 ASTM F2328M ISO 898-1	(Qualitative)
5.	Hardened Bolt, Screw & Stud (Metric Series)	Thread Lap	ISO 6157-3	(Qualitative)
6.	Metallic Coating	<b>Coating Thickness (Microscopic Method) #D</b>	ASTM B487	0.01 to 1.0 mm
		Coating Thickness by X-Ray Fluorescence	ISO 3497 ASTM B568	2 to 60 micron (Cd on steel), 2 to 40 micron (Zn on steel), 2 to 30 micron (Zn-Ni on steel)
		Salt Spray Test	ASTM B117	(Qualitative)

Venugopal. C  
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N. Venkateswaran  
Program Director