

Laboratory **Bharat Forge Limited - Kalyani Centre for Technology & Innovation (KCTI), Survey No. 15, Keshav Nagar, Pune, Maharashtra**

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

Certificate Number **TC-7193 (in lieu of T-3873)**

Page 1 of 1

Validity **01.04.2018 to 31.03.2020**

Last Amended on **26.04.2018**

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**

<b>I. MECHANICAL PROPERTIES OF METALS</b>				
<b>1.</b>	<b>Ferrous &amp; Non-Ferrous Alloys Products</b>	<b>Tensile Test</b>	ASTM E8/E8M-16a (2016)	
		UTS		100 MPa to 1300 Mpa
		0.2 % PS		80 MPa to 1200 MPa
		% Elongation		1 % to 40 %
		% RA		2 % to 60 %
		<b>Compression Test</b>	ASTM E9-09 (2009)	
		Load		Upto 250 kN
		0.2 % offset compressive yield strength		100 MPa to 1200 MPa
		Young's Modulus		80 GPa to 220 GPa
		Fracture Toughness Test: KIC	ASTM E399-12e3 (2012)	
Fracture Toughness Test: JIC	ASTM E 1820-2017		JIC: 65 kJ/m <sup>2</sup> to 300 kJ/m <sup>2</sup>	
Fatigue Crack Growth Rate, FCGR (da/dN)	ASTM 647-2015		da/dN: Upto 10 <sup>-4</sup> mm/cycle	
Grain size	ASTM 112-2013 (Comparison)		ASTM No. 1 to 10 Magnification: 100 X	
<b>2.</b>	<b>Steels</b>	Decarbonized layer	ASTM E 1077-2014 (microscopic method)	0.01 mm to 1.0 mm
		Inclusion Rating (Method A)	ASTM E 45-2013 (Method A)	Type A,B,C,D (Thin / Heavy)
<b>II. METALLOGRAPHY TEST</b>				
<b>1.</b>	<b>Ferrous and Non-Ferrous Products</b>	Microstructural Analysis	ASM Metal Handbook (vol. 7) Atlas of Microstructure of Industrial Alloys	Up to 1000X