

**Laboratory** L & T Special Steels and Heavy Forgings Laboratory,  
Hazira Manufacturing Complex, PO: Bhatha, Surat, Gujarat

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

**Discipline** Chemical Testing **Issue Date** 07.06.2014

**Certificate Number** T-2254 **Valid Until** 06.06.2016

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S.No.	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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#### I. METALS & ALLOYS

1.	Carbon, Low alloy Steels & Forgings	Carbon	ASTM E 415-2008	0.001% to 1.5%
		Silicon	IS 8811-1998	0.005% to 2.0%
		Manganese		0.10% to 2.0%
		Sulphur		0.002% to 0.10%
		Phosphorus		0.002% to 0.20%
		Chromium		0.005% to 22.0%
		Nickel		0.01% to 4.2%
		Molybdenum		0.0007% to 1.5%
		Aluminium		0.0003% to 1.2%
		Aluminium Soluble		0.0003% to 1.2%
		Boron		0.00015% to 0.006%
		Cobalt		0.002% to 0.10%
		Copper		0.005% to 0.8%
		Niobium		0.0005% to 0.1%
		Titanium		0.0005% to 0.1%
		Vanadium		0.0001% to 0.5%
		Tungsten		0.001% to 1.0%
Tin		0.0005% to 0.10%		
Arsenic		0.0005% to 0.10%		
Calcium		0.00015% to 0.01%		
Antimony		0.0005% to 0.10%		
Tantalum		0.001% to 0.05%		
Nitrogen		0.0015% to 0.03%		

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2.	<b>Stainless Steels &amp; Forgings</b>	Carbon	ASTM E 1086-2008	0.005% to 1.0 %
		Silicon	IS 9879-1998	0.10% to 1.0%
		Manganese		0.20% to 2.0%
		Sulphur		0.0005% to 0.04%
		Phosphorus		0.005% to 0.03%
		Chromium		8.00% to 28.0%
		Nickel		0.10% to 31.0%
		Molybdenum		0.05% to 3.5%
		Aluminium		0.001% to 0.005%
		Boron		0.00015% to 0.004%
		Cobalt		0.01% to 0.25%
		Copper		0.05% to 1.0%
		Niobium		0.20% to 1.0%
		Titanium		0.001% to 0.005%
		Vanadium		0.01% to 0.50%
		Tungsten		0.002% to 0.04%
		Tin		0.001% to 0.10%
		Arsenic		0.002% to 0.020%
		Calcium		0.0001% to 0.005%
		Antimony		0.0002% to 0.001%
		Tantalum		0.0005% to 0.002%
		Nitrogen		0.001% to 0.075%

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3.	Carbon, Low alloy and Stainless Steels & Forgings	Carbon	ASTM E 1019-2011	0.0005% to 3.5%
		Sulfur		0.0005% to 4.0%
		Oxygen		0.0001% to 1.1%
		Hydrogen		0.00007% to 0.0025%
		Nitrogen		0.0010% to 0.2%
		Manganese	ASTM E 1476-2004 ASTM E 322-2012 ASTM E 572-2013	Qualitative
		Silicon		
		Sulphur		
		Chromium		
		Nickel		
		Molybdenum		
		Aluminium		
		Cobalt		
		Niobium		
		Titanium		
Vanadium				
Tungsten				
Tin				
Copper				
Fe				

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