

Laboratory	TCR Engineering Services Private Limited, Plot No. EL-182, MIDC, TTC Industrial Area, Electronic Zone, Mahape, Navi Mumbai, Maharashtra		
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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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AT LABORATORY

I. METAL & ALLOYS

1. Iron Base & Its Alloys: Stainless Steel, Carbon & Low Alloy Steel, Tool Steel, Cast Iron	By Wet			
	Carbon		ASTM E1019: 2011 (LECO-CS)	0.001 % to 4.50 %
	Sulphur		ASTM E1019: 2011 (LECO-CS)	0.0001 % to 0.60 %
	Phosphorus		IS 228 (Part 3): 1987	0.010 % to 0.50 %
	Manganese		IS 228 (Part 2): 1987	0.10 % to 10.0 %
	Silicon		IS 228 (Part 8): 1989	0.05 % to 5.0 %
	Chromium		IS 228 (Part 6): 1987 TCR-TM-06-2016	0.10 % to 40.0 %
	Nickel		IS 228 (Part 5): 1987	0.10 % to 50.0 %
2. Copper Base & Its Alloys	Nitrogen		IS 228 (Part 19): 1998	0.001 % to 0.50 %
	Tungsten		IS 228 (Part 16): 1992	0.10 % to 25.0 %
	By Wet			
	Copper-(Pure)		IS 440: 1964 (RA 2006)	90.00 % to 99.99 %
	Copper(Cu Base Alloy)		IS 3685: 1966 (RA 1996) IS 4027: 1990	30 % to 90 %
	Tin		IS 4027: 1990 ASTM E 478-08	0.10 % to 10.0 %
Zinc		ASTM E 478-08	0.5 % to 20.0 %	

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	Copper Base & Its Alloys	Lead	IS 3685: 1966 (RA 1996) ASTM-E-478-08 IS 4027: 1990	0.01 % to 15.0 %
		Iron	IS 3685: 1966 (RA 1966)	0.01 % to 1.0 %
		Nickel	ASTM-E-478-08	4.0 % to 50.0 %
		Silicon	ASTM-E-478-08	0.001 % to 5.0 %
		Phosphorus	IS 4027: 1990 IS 3685: 1966 (RA 1966)	0.0001 % to 1.00 %
		Sulfur	ASTM E1019: 2011 (LECO-CS)	0.001 % to 0.10 %
		Carbon	ASTM E1019: 2011 (LECO-CS)	0.001 % to 0.30 %
3.	Aluminum Base & Its Alloys	By Wet		
		Silicon	IS 504: 1963 IS 504 (Part 1): 2002 ASTM E 34: 2011	0.02 % to 15.0 % 0.05 % to 20.0 %
4.	Nickel Base & Its Alloys	By Wet		
		Aluminum	ASTM E 354: 2014	0.20 % to 18.0 %
		Carbon	E1019-11 (LECO-CS)	0.005 % to 1.0 %
		Sulphur	E1019-11 (LECO-CS)	0.002 % to 0.10 %
		Phosphorus	ASTM E 354: 2014	0.01 % to 0.080 %
		Silicon	ASTM E 354: 2014	0.01 % to 5.0 %
	Chromium	ASTM E 354: 2014	0.10 % to 33.0 %	

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	Nickel Base & Its Alloys	Molybdenum	ASTM E 354: 2014	1.5 % to 30.0 %
		Nitrogen	TCR/TM/04: 2006	0.001 % to 0.50 %
		Copper	ASTM E 354: 2014	0.001 % to 10.0 %
		Nickel	ASTM E 354: 2014	30.00 % to 99.00 %
5.	Iron Base & Its Alloys By/ AAS / ICP	Manganese	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06(2013)	0.001 % to 20 %
		Chromium	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 4 % 0.001 % to 40 %
		Nickel	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 50 % 0.001 % to 15 %
		Molybdenum	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 15 % 0.001 % to 7 %
		Titanium	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 2 %
		Niobium	TCR/TM- ICP-01-06 (2013)	0.001 % to 2 %
		Zirconium	TCR/TM- ICP-01-06 (2013)	0.001 % to 0.8 %
		Vanadium	TCR/TM- ICP-01-06 (2013)	0.001 % to 5 %
		Copper	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 5 %
		Aluminum	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 2 %

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	Iron Base & Its Alloys By/ AAS / ICP	Tungsten	TCR/TM- ICP-01-06 (2013)	0.001 % to 25 %
		Cobalt	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 15 %
		Tin	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 0.1 %
		Antimony	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 0.5 %
		Tantalum	TCR/TM- ICP-01-06 (2013)	0.01 % to 0.6 %
		Boron	TCR/TM- ICP-01-06 (2013)	0.01 % to 2 %
		Lead	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.0001 % to 0.6 %
		Magnesium	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 0.5 %
		Arsenic	TCR/TM-AAS-01-06 (2013) TCR/TM- ICP-01-06 (2013)	0.001 % to 0.5 %
		6.	Copper Base & Its Alloys By/ AAS / ICP	Tin
Zinc	TCR/TM-AAS-02-06 (2013) TCR/TM- ICP-02-06 (2013)			0.001 % to 40 %
Lead	TCR/TM-AAS-02-06 (2013) TCR/TM- ICP-02-06 (2013)			0.0001 % to 25 %
Iron	TCR/TM-AAS-02-06 (2013) TCR/TM- ICP-02-06 (2013)			0.001 % to 15 %

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	Copper Base & Its Alloys By/ AAS / ICP	Nickel	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.001 % to 50 %
		Aluminum	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.001 % to 50 %
		Manganese	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.001 % to 6.0 %
		Arsenic	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.0001 % to 2 %
		Cobalt	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.001 % to 1.0 %
		Antimony	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.001 % to 5 %
		Silver	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.001 % to 20 %
		Cadmium	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.0001 % to 3 %
		Beryllium	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.001 % to 3 %
		Bismuth	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.001 % to 0.1 %
		Chromium	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.01 % to 1.0 %
		Tellurium	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.01 % to 0.10 %

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	Copper Base & Its Alloys By/ AAS / ICP	Selenium	TCR/TM–AAS-02-06 (2013) TCR/TM– ICP-02-06 (2013)	0.01 % to 0.10 %
		Mercury	TCR/TM– ICP-02-06 (2013)	0.001 % to 0.10 %
7.	Aluminum Base & Its Alloys By AAS / ICP	Tin	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 1.00 % 0.001 % to 0.10 %
		Zinc	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 12 %
		Lead	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 1.0 %
		Iron	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 3 %
		Nickel	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 4 %
		Manganese	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 2 %
		Titanium	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 0.30 %
		Chromium	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 1 %
		Magnesium	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 2 %
		Boron	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.010 % to 0.060 %

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	Aluminum Base & Its Alloys By AAS / ICP	Zirconium	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 0.30 %
		Vanadium	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 0.5 %
		Cadmium	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 0.5 %
8.	Nickel Base & Its Alloys By AAS / ICP	Manganese	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.005 % to 10 %
		Chromium	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 20 %
		Molybdenum	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.01 % to 15 % 0.001 % to 5 %
		Copper	TCR/TM–AAS-03-06 (2013) TCR/TM– ICP-03-06 (2013)	0.001 % to 1 % 0.01 % to 5 %
		Tungsten	TCR/TM– ICP-04-06 (2013)	0.01 % to 10 %
		Iron	TCR/TM–AAS-04-06 (2013) TCR/TM– ICP-04-06 (2013)	0.01 % to 50 % 0.01 % to 10 %
		Aluminum	TCR/TM–AAS-04-06 (2013) TCR/TM– ICP-04-06 (2013)	0.01 % to 18 %
		Titanium	TCR/TM–AAS-04-06 (2013) TCR/TM– ICP-04-06 (2013)	0.01 % to 5 %
		Vanadium	TCR/TM–AAS-04-06 (2013) TCR/TM– ICP-04-06 (2013)	0.001 % to 3.5 %

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	Nickel Base & Its Alloys By AAS / ICP	Niobium	TCR/TM--AAS-04-06 (2013) TCR/TM-- ICP-04-06 (2013)	0.001 % to 6 %
		Cobalt	TCR/TM--AAS-04-06 (2013) TCR/TM-- ICP-04-06 (2013)	0.001 % to 10 % 10.00 % to 75.00 %
		Nickel	TCR/TM--AAS-04-06 (2013) TCR/TM-- ICP-04-06 (2013)	0.10 % to 20 % 0. 10 % to 75 %
		Tantalum	TCR/TM-- ICP-04-06 (2013)	0.001 % to 2 %
9.	Ferrous Base: Stainless Steel	BY OES		
		Carbon	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.01 % to 1.5 %
		Sulphur	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.001 % to 0.3 %
		Phosphorus	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.01 % to 0.3 %
		Manganese	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.10 % to 18.0 %
		Silicon	ASTM E1086: 2014 IS 9879: 98 (Sp) TCR/TM-03 (2013)	0.10 % to 2.0 %
	Chromium	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	5.0 % to 35.0 %	

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	Ferrous Base: Stainless Steel	Nickel	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.2 % to 50 %
		Molybdenum	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.01 % to 4 %
		Titanium	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.005 % to 2.0 %
		Niobium	ASTM E1086: 2014	0.001 % to 2.00 %
		Zirconium	TCR/TM-03 (2013)	0.003 % to 0.8 %
		Vanadium	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.001 % to 5 %
		Copper	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.001 % to 5 %
		Aluminum	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.001 % to 2 %
		Tungsten	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.001 % to 25 %
		Cobalt	ASTM E1086: 2014 IS 9879: 98 TCR/TM-03 (2013)	0.001 % to 0.1 %

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	Ferrous Base: Stainless Steel	Tin	TCR/TM-03 (2013)	0.001 % to 0.1 %
		Antimony	TCR/TM-03 (2013)	0.01 % to 0.5 %
		Tantalum	TCR/TM-03 (2013)	0.001 % to 0.5 %
		Boron	TCR/TM-03 (2013)	0.001 % to 2 %
		Lead	TCR/TM-03 (2013)	0.001 % to 0.6 %
		Nitrogen	TCR/TM-03 (2013)	0.010 % to 0.5 %
10.	Ferrous Base: Carbon Steel & Low Alloy Steel	By OES		
		Carbon	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.0010 % to 1.5 %
		Sulphur	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.001 % to 0.3 %
		Phosphorus	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.001 % to 0.3 %
		Manganese	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.01 % to 4 %
	Silicon	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.01 % to 2.00 %	

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	Ferrous Base: Carbon Steel & Low Alloy Steel	Chromium	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.01 % to 4.00 %
		Nickel	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.01 % to 4.50 %
		Molybdenum	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.010 % to 4.00 %
		Titanium	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.010 % to 2.0 %
		Niobium	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.01 % to 2.00 %
		Zirconium	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.001 % to 0.8 %
		Vanadium	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.001 % to 5 %
		Copper	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.01 % to 5 %
		Aluminum	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.001 % to 2 %

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	Ferrous Base: Carbon Steel & Low Alloy Steel	Tungsten	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.01 % to 2 %
		Cobalt	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.005 % to 1.0 %
		Tin	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.005 % to 0.1 %
		Antimony	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.01 % to 0.5 %
		Tantalum	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.01 % to 0.5 %
		Boron	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.001 % to 0.10 %
		Lead	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.001 % to 0.6 %
		Nitrogen	ASTM E415: 2014 IS 8811: 98 TCR/TM-03 (2013)	0.01 % to 0.5 %
11.	Ferrous Base: Tool Steel	By OES		
		Carbon	TCR/TM-03 (2013)	0.20 % to 3.00 %

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	Ferrous Base: Tool Steel	Sulphur	TCR/TM-03 (2013)	0.010 % to 0.05 %
		Phosphorus	TCR/TM-03 (2013)	0.01 % to 0.5 %
		Manganese	TCR/TM-03 (2013)	0.10 % to 0.60 %
		Silicon	TCR/TM-03 (2013)	0.10 % to 1.50 %
		Chromium	TCR/TM-03 (2013)	2.0 % to 16.0 %
		Nickel	TCR/TM-03 (2013)	0.01 % to 4.50 %
		Molybdenum	TCR/TM-03 (2013)	0.20 % to 12 %
		Titanium	TCR/TM-03 (2013)	0.001 % to 2.0 %
		Copper	TCR/TM-03 (2013)	0.001 % to 2.0 %
		Cobalt	TCR/TM-03 (2013)	0.01 % to 14.00 %
		Vanadium	TCR/TM-03 (2013)	0.001 % to 6.00 %
	Tungsten	TCR/TM-03 (2013)	0.001 % to 14.00 %	
12.	Ferrous Base: Cast Iron	By OES		
		Carbon	ASTM E 1999: 2011 TCR/TM-03 (2013)	2.00 % to 4.00 %
		Sulphur	ASTM E 1999: 2011 TCR/TM-03 (2013)	0.01 % to 0.30 %
	Phosphorus	ASTM E 1999: 2011 TCR/TM-03 (2013)	0.01 % to 0.20 %	

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	Ferrous Base: Cast Iron	Manganese	ASTM E 1999: 2011 TCR/TM-03 (2013)	0.05 % to 2.50 %
		Silicon	ASTM E 1999: 2011 TCR/TM-03 (2013)	1.00 % to 2.00 %
		Chromium	ASTM E 1999: 2011 TCR/TM-03 (2013)	0.5 % to 1.00 %
		Nickel	ASTM E 1999: 2011 TCR/TM-03 (2013)	0.1 % to 3.00 %
		Molybdenum	ASTM E 1999: 2011 TCR/TM-03 (2013)	0.05 % to 0.50 %
		Titanium	ASTM E 1999: 2011 TCR/TM-03 (2013)	0.001 % to 2.0 %
		Copper	ASTM E 1999: 2011 TCR/TM-03 (2013)	1.00 % to 4.00 %
		Aluminum	ASTM E 1999: 2011 TCR/TM-03 (2013)	0.010 % to 0.50 %
		Tin	ASTM E 1999: 2011 TCR/TM-03 (2013)	0.010 % to 0.10 %
		Lead	ASTM E 1999: 2011 TCR/TM-03 (2013)	0.001 % to 0.10 %
13.	Non Ferrous Base: Copper and Its Alloys	By OES		
		Tin	TCR/TM-03(2013)	0.001 % to 20 %
	Zinc	TCR/TM-03(2013)	0.001 % to 50 %	

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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
	Non Ferrous Base: Copper and Its Alloys	Lead	TCR/TM-03 (2013)	0.001 % to 25 %
		Iron	TCR/TM-03 (2013)	0.001 % to 6 %
		Nickel	TCR/TM-03 (2013)	0.001 % to 50 %
		Aluminum	TCR/TM-03 (2013)	0.001 % to 15 %
		Manganese	TCR/TM-03 (2013)	0.001 % to 15 %
		Carbon	TCR/TM-03 (2013)	0.001 % to 1.00 %
		Sulphur	TCR/TM-03 (2013)	0.001 % to 0.1 %
		Arsenic	TCR/TM-03 (2013)	0.001 % to 2 %
		Cobalt	TCR/TM-03 (2013)	0.01 % to 1.00 %
		Antimony	TCR/TM-03 (2013)	0.001 % to 5 %
		Silver	TCR/TM-03 (2013)	0.001 % to 20 %
		Cadmium	TCR/TM-03 (2013)	0.0005 % to 1 %
		Beryllium	TCR/TM-03 (2013)	0.0001 % to 3 %
		Bismuth	TCR/TM-03 (2013)	0.001 % to 0.1 %
		Silicon	TCR/TM-03 (2013)	0.001 % to 5 %
		Chromium	TCR/TM-03 (2013)	0.0005 % to 2 %
	Phosphorus	TCR/TM-03 (2013)	0.001 % to 1.50 %	

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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
14.	Non Ferrous Base: Aluminum & Its Alloys	By OES		
		Copper	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 20 %
		Tin	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 8 %
		Zinc	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 10 %
		Lead	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 0.5 %
		Iron	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 1 %
		Nickel	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 3 %
		Manganese	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 2 %
		Titanium	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 0.5 %
Chromium	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 0.5 %		

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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
	Non Ferrous Base: Aluminum & Its Alloys	Silicon	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 25 %
		Magnesium	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 7 %
		Boron	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 1.00 %
		Zirconium	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 5 %
		Vanadium	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 1 %
		Cadmium	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 0.2 %
		Phosphorus	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 0.2 %
		Antimony	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 0.50 %
		Strontium	ASTM E 227: 1996 TCR/TM-03 (2013) ASTM E 1251: 2011	0.001 % to 0.007 %

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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
15.	Non Ferrous Base: Nickel & Its Alloys	By OES		
		Carbon	TCR/TM-03 (2013)	0.001 % to 1 %
		Sulphur	TCR/TM-03 (2013)	0.001 % to 0.5 %
		Phosphorus	TCR/TM-03 (2013)	0.001 % to 0.5 %
		Manganese	TCR/TM-03 (2013)	0.001 % to 10 %
		Silicon	TCR/TM-03 (2013)	0.005 % to 10 %
		Chromium	TCR/TM-03 (2013)	0.001 % to 40 %
		Molybdenum	TCR/TM-03 (2013)	0.001 % to 40 %
		Copper	TCR/TM-03 (2013)	0.001 % to 40 %
		Tungsten	TCR/TM-03 (2013)	0.001 % to 10 %
		Iron	TCR/TM-03 (2013)	0.001 % to 20 %
		Aluminum	TCR/TM-03 (2013)	0.001 % to 5 %
		Titanium	TCR/TM-03 (2013)	0.001 % to 5 %
		Vanadium	TCR/TM-03 (2013)	0.001 % to 1 %
Niobium	TCR/TM-03 (2013)	0.001 % to 5 %		
Cobalt	TCR/TM-03 (2013)	0.001 % to 5 %		
Tantalum	TCR/TM-03 (2013)	0.001 % to 2 %		

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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
16.	Ferrous Base	Positive Material Identification – By XRF		
		Chromium	ASTM E1476-04 (2014)	Qualitative
		Nickel	ASTM E1476-04 (2014)	Qualitative
		Molybdenum	ASTM E1476-04 (2014)	Qualitative
		Vanadium	ASTM E1476-04 (2014)	Qualitative
		Tungsten	ASTM E1476-04 (2014)	Qualitative
		Cobalt	ASTM E1476-04 (2014)	Qualitative
		Niobium	ASTM E1476-04 (2014)	Qualitative
		Titanium	ASTM E1476-04 (2014)	Qualitative
		Copper	ASTM E1476-04 (2014)	Qualitative
17.	Nickel Base	Positive Material Identification – By XRF		
		Nickel	ASTM E1476-04 (2014)	Qualitative
		Molybdenum	ASTM E1476-04 (2014)	Qualitative
		Tungsten	ASTM E1476-04 (2014)	Qualitative
		Cobalt	ASTM E1476-04 (2014)	Qualitative
		Niobium	ASTM E1476-04 (2014)	Qualitative
		Titanium	ASTM E1476-04 (2014)	Qualitative

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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
18.	Copper Base	Positive Material Identification – By XRF		
		Copper	ASTM E1476-04 (2014)	Qualitative
		Zinc	ASTM E1476-04 (2014)	Qualitative
		Lead	ASTM E1476-04 (2014)	Qualitative
		Tin	ASTM E1476-04 (2014)	Qualitative
	Nickel	ASTM E1476-04 (2014)	Qualitative	
19.	Polymer (Products of Plastics, Resins, Paints, Rubbers Glues, Fabrics, Paper Products)	Mercury	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Lead	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Chromium	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Cadmium	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm

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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
20.	Metallic (Ferrous Metal & Its Alloys: Stainless Steels, Low Alloy Steel, Carbon Steel, Tool Steel, Cast Irons) Non Ferrous Metals & Its Alloys: Aluminum, Copper, Nickel, Lead and Tin Base	Mercury	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Lead	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Chromium/Cr (VI)	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Cadmium	IEC 6231(Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
21.	Electronics (Capacitors, Power Cables, Light Fixtures, Types of Lamps Resistors, Transistors, Solders, PCB Electrical Wirings, Various Computer Parts)	Mercury	IEC 6231(Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Lead	IEC 6231(Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Chromium	IEC 6231-3-1:2013 IS 16197 (Part 3/Sec I): 2014 TCR/TM/ICP/05 IEC 62321 (Edition 1) 2008-12	10 ppm to 1000 ppm
		Cadmium	IEC 6231(Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm

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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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AT SITE

I. METAL & ALLOYS

1.	Ferrous Base	Positive Material Identification – By XRF		
		Chromium	ASTM E1476-04 (2014)	Qualitative
		Nickel	ASTM E1476-04 (2014)	Qualitative
		Molybdenum	ASTM E1476-04 (2014)	Qualitative
		Vanadium	ASTM E1476-04 (2014)	Qualitative
		Tungsten	ASTM E1476-04 (2014)	Qualitative
		Cobalt	ASTM E1476-04 (2014)	Qualitative
		Niobium	ASTM E1476-04 (2014)	Qualitative
		Titanium	ASTM E1476-04 (2014)	Qualitative
		Copper	ASTM E1476-04 (2014)	Qualitative
2.	Nickel Base	Positive Material Identification – By XRF		
		Nickel	ASTM E1476-04 (2014)	Qualitative
		Molybdenum	ASTM E1476-04 (2014)	Qualitative
		Tungsten	ASTM E1476-04 (2014)	Qualitative
		Cobalt	ASTM E1476-04 (2014)	Qualitative
		Niobium	ASTM E1476-04 (2014)	Qualitative
		Titanium	ASTM E1476-04 (2014)	Qualitative

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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
3.	Copper Base	Positive Material Identification – By XRF		
		Copper	ASTM E1476-04 (2014)	Qualitative
		Zinc	ASTM E1476-04 (2014)	Qualitative
		Lead	ASTM E1476-04 (2014)	Qualitative
		Tin	ASTM E1476-04 (2014)	Qualitative
	Nickel	ASTM E1476-04 (2014)	Qualitative	
4.	Polymer (Products of Plastics, Resins, Paints, Rubbers Glues, Fabrics, Paper Products)	Mercury	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Lead	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & b 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Chromium	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Cadmium	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm

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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
5.	Metallic (Ferrous Metal & Its Alloys: Stainless Steels, Low Alloy Steel, Carbon Steel, Tool Steel, Cast Irons) Non Ferrous Metals & Its Alloys: Aluminum, Copper, Nickel, Lead and Tin Base	Mercury	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Lead	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Chromium/Cr (VI)	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Cadmium	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
6.	Electronics (Capacitors, Power Cables, Light Fixtures, Types of Lamps Resistors, Transistors, Solders, PCB Electrical Wirings, Various Computer Parts)	Mercury	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Lead	IEC 6231 (Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm
		Chromium	IEC 6231-3-1:2013 IS 16197 (Part 3/Sec I): 2014 TCR/TM/ICP/05 IEC 62321 (Edition 1) 2008-12	10 ppm to 1000 ppm
		Cadmium	IEC 6231(Part 1 & 5): 2013 IS 16197 (Part 1 & 5): 2014 TCR/TM/ICP/05	10 ppm to 1000 ppm

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