Laboratory	**Metallurgical & Chemical Laboratory, Rail Coach Factory, Kapurthala, Punjab**			
Accreditation Standard	**ISO/IEC 17025:2005**			
Discipline	**Chemical Testing**	**Issue Date**	**04.09.2013**	
Certificate Number	**T-1535**	**Valid Until**	**03.09.2015**	
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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Limits of Detection/ Range of Testing
I. METALS & ALLOYS				
1.	**Iron Base (Plain Carbon Steel, Low Alloy Steel, Ferritic Stainless Steel Tool Steel, High Nickel Steel)**	Carbon	ASTM E 415-08; ASTM E 1086-08; ASTM E 1999-11 (by Spectrometer OES)	0.01% to 3.8%
		Silicon		0.01% to 2.5%
		Manganese		0.01% to 2.5%
		Phosphorus		0.005% to 0.16%
		Sulfur		0.01% to 0.11%
		Chromium		0.01% to 26.2%
		Nickel		0.01% to 40.0%
		Molybdenum		0.01% to 5.5%
		Copper		0.01% to 4.0%
		Vanadium		0.01% to 2.5%
		Aluminum		0.01% to 0.8%
		Titanium		0.01% to 0.8%
		Tin		0.02% to 0.245%
		Boron		0.01% to 0.02%

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Limits of Detection/ Range of Testing
	Iron Base (Plain Carbon Steel, Low Alloy Steel, Ferritic Stainless Steel Tool Steel, High Nickel Steel)	Cobalt		0.01% to 5.0%
		Niobium		0.01% to 1.6%
		Tungsten		0.01% to 20.0%
		Lead		0.01% to 0.10%
2.	**Iron Base (Austenitic Stainless Steel)**	Carbon	ASTM E 415-08; ASTM E 1086-08; ASTM E 1999-11 (by Spectrometer OES)	0.001% to 0.3%
		Silicon		0.01% to 2.5%
		Manganese		0.01% to 2.5%
		Phosphorus		0.005% to 0.08%
		Sulfur		0.01% to 0.08%
		Chromium		0.01% to 26.0%
		Nickel		0.01% to 35.0%
		Molybdenum		0.01% to 4.5%
		Copper		0.01% to 2.8%
		Vanadium		0.01% to 0.50%
		Titanium		0.01% to 0.70%
		Cobalt		0.01% to 0.40%

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Limits of Detection/ Range of Testing
3.	**Iron Base (Cast Iron)**	Carbon	ASTM E 415-08; ASTM E 1086-08; ASTM E 1999-11 (by Spectrometer OES)	0.05% to 3.8%
		Silicon		0. 01% to 2.5%
		Manganese		0.01% to 2.5%
		Phosphorus		0.01% to 0.16%
		Sulfur		0.01% to 0.10%
		Chromium		0.01% to 2.4%
		Nickel		0.01% to 3.0%
		Molybdenum		0.01% to 1.6%
		Copper		0.01% to 1.5%
		Vanadium		0.01% to 2.0%
		Tin		0.02% to 0.24%
		Cobalt		0.01% to 4.0%
		Tungsten		0.01% to 3.0%
		Lead		0.01% to 0.10%

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Limits of Detection/ Range of Testing
4.	**Copper Base & Its Alloy**	Tin	ASTM-E 478-08 ASTM E 1507-2003 (by Spectrometer OES)	0.01% to 16%
		Lead		0.01% to 3.8%
		Zinc		0.01% to 48.00%
		Nickel		0.05% to 6.5%
		Phosphorus		0.01% to 1.0%
		Iron		0.01% to 8.50%
		Silicon		0.01% to 1.4%
		Manganese		0.01% to 1.60%
		Arsenic		0.01% to 0.22%
		Antimony		0.01% to 0.4%
		Aluminum		0.01% to 13.00%
		Magnesium		0.01% to 0.30%
		Chromium		0.01% to 0.20%
		Cobalt		0.01% to 3.90%
		Beryllium		0.02% to 0.9%

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Limits of Detection/ Range of Testing
5.	**Aluminum Base & Its Alloy**	Copper	ASTM E 1251-11 (by Spectrometer OES)	0.01% to 2.5%
		Magnesium		0.001% to 4.0%
		Silicon		0.01% to 19%
		Iron		0.01% to 2.0%
		Manganese		0.01% to 2.5%
		Zinc		0.02% to 4.0%
		Lead		0.02% to 0.6%
		Tin		0.01% to 0.06%
		Titanium		0.01% to 0.6%
		Chromium		0.01% to 0.35%

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