

Laboratory **SGS India Private Limited, Testing Laboratory – Transportation, Consumer and Retail, Gat No. 624/2, Chakan, Kuruli, Taluka-Khed, Pune, Maharashtra**

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

Certificate Number **TC-5825 (In lieu of T-2038, T-2606 & T-2039)** **Page 1 of 19**

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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
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CHEMICAL TESTING

I.	METALS & ALLOYS			
1.	Cast Iron	Carbon	ASTM E1999 & IS 15338	2.00 % to 4.50 %
		Silicon		1.00 % to 5.00 %
		Manganese		0.050 % to 0.90 %
		Phosphorus		0.005 % to 0.50 %
		Sulphur		0.005 % to 0.50 %
		Nickel		0.05 % to 0.50 %
		Chromium		0.02 % to 1.15 %
		Molybdenum		0.02 % to 0.5 %
		Copper		0.030 % to 2.200 %
		Vanadium		0.050 % to 0.25 %
		Magnesium		0.010 % to 0.060 %
2.	Tool Steel	Carbon	In House Method: SO-IN-TRP-T01-QU-017	0.17 % to 2.00 %
		Silicon		0.10 % to 0.4 %
		Manganese		0.20 % to 0.50 %
		Phosphorous		0.002 % to 0.040 %
		Sulphur		0.002 % to 0.040 %
		Chromium		3.5 % to 13.5 %
		Molybdenum		0.10 % to 5.00 %
		Cobalt		0.01 % to 10.5 %
		Vanadium		0.10 % to 4.00 %
		Tungsten		2.0 % to 10.5% %
3.	Low Alloy Steel	Carbon	ASTM E415 IS 8811	0.01 % to 1.80 %
		Silicon		0.020 % to 1.90 %
		Manganese		0.05 % to 12.00 %
		Phosphorous		0.003 % to 0.10 %
		Sulphur		0.005 % to 0.30 %
		Nickel		0.05 % to 4.000 %
		Chromium		0.050 % to 2.50 %
Molybdenum	0.010 % to 0.50 %			

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		Copper		0.010 % to 0.50 %
		Vanadium		0.01 % to 1.00 %
		Titanium		0.01 % to 0.51%
		Niobium		0.01 % to 0.50%
		Aluminium		0.005 % to 0.060 %
		Boron		0.0005 % to 0.0010 %
		Lead		0.05 % to 0.35 %
4.	Stainless Steel	Carbon	ASTM E1086	0.005 % to 0.600 %
		Silicon	IS 9879	0.150 % to 1.00 %
		Manganese		0.05 % to 12.00 %
		Phosphorus		0.005 % to 0.10 %
		Sulphur		0.005 % to 0.30 %
		Nickel		0.05 % to 25.00 %
		Chromium		1.37 % to 26.00 %
		Molybdenum		0.050 % to 3.50 %
		Copper		0.020 % to 1.20 %
		Vanadium		0.050 % to 0.150 %
		Aluminium		0.020 % to 0.050 %
		Titanium		0.050 % to 0.60 %
		Cobalt		0.020 % to 0.200 %
		Niobium		0.010 % to 0.50 %
		Lead		0.004 % to 0.040 %
		Nitrogen		0.007 % to 0.4 %
5.	Copper Alloys	Tin	BS EN 15079	0.05 % to 12.0 %
		Lead		0.05 % to 7.50 %
		Iron		0.01 % to 4.00 %
		Aluminium		0.01 % to 12.0 %
		Arsenic		0.005% to 0.15 %
		Nickel		0.01 % to 1.00 %
		Manganese		0.01 % to 1.50 %
		Phosphorus		0.010 % to 1.0 %
		Silicon		0.010 % to 1.0 %

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		Zinc		0.010 % to 45.0 %
6.	Aluminium Alloys	Silicon	ASTM E1251	0.10 % to 22.00 %
		Iron	IS 11035	0.10 % to 1.00 %
		Copper		0.05 % to 5.00 %
		Manganese		0.05 % to 1.00 %
		Magnesium		0.05 % to 5.00 %
		Chromium		0.01 % to 0.30 %
		Nickel		0.01 % to 3.00 %
		Zinc		0.01 % to 2.00 %
		Bismuth		0.01 % to 0.70 %
		Titanium		0.01 % to 0.50 %
		Lead		0.01 % to 0.60 %
		Tin		0.01 % to 0.35 %
7.	Zinc Alloys	Silicon	ASTM E536	0.011 % to 0.025 %
		Iron	IS 2599	0.001 % to 0.022 %
		Copper		0.003 % to 1.122 %
		Manganese		0.002 % to 0.044 %
		Magnesium		0.001 % to 0.10 %
		Chromium		0.0025 % to 0.01 %
		Cadmium		0.0005 % to 0.40 %
		Nickel		0.0019 % to 0.025 %
		Aluminium		0.006 % to 7.360 %
		Lead		0.005 % to 0.010 %
		Tin		0.002 % to 0.010 %
8.	Electro-Technical Products Restriction of Hazardous Substances (ROHS)	Flame Retardants - PBB (Polybrominated Biphenyl)	In house Methods SO-IN-CRS-C06-QU-006 (based on below standards)	50 to 1000 mg/kg
		Monobromobiphenyl	IEC 62321-6	
		Dibromobiphenyl	US EPA 3540C	
		Tribromobiphenyl		
		Tetrabromobiphenyl		
		Pentabromobiphenyl		

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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
		Hexabromobiphenyl		
		Heptabromobiphenyl		
		Octabromobiphenyl		
		Nonabromobiphenyl		
		Decabromobiphenyl		
		Flame Retardants - PBDE (Polybrominated Diphenyl Ether)	In house Methods SO-IN-CRS-C06-QU-006 (based on below standards)	50 to1000 mg/kg
		Monobromodiphenyl ether	IEC 62321-6 US EPA 3540C	
		Dibromodiphenyl ether		
		Tribromodiphenyl ether		
		Tetrabromodiphenyl ether		
		Pentabromodiphenyl ether		
		Hexabromodiphenyl ether		
		Heptabromodiphenyl ether		
		Octabromodiphenyl ether		
		Nonabromodiphenyl ether		
		Decabromodiphenyl ether		
		Determination of Hexavalent Chromium	In house Methods SO-IN-CRS-C06-QU-004 (based on below standards)	Qualitative
			US EPA 3060A	
			US EPA 7196A	
			IEC 62321-7-1	

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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
		Determination of Total Lead Content & Total Cadmium Content	In house Methods SO-IN-CRS-C06-QU-007 (based on below standards) US EPA 3050B US EPA 3051A US EPA 3052 IEC 62321-5 CPSC-CH-E1001-8.3	Pb : 5 to1000 mg/kg Cd : 5 to1000 mg/kg
		Determination of Total Chromium Content	In house Methods SO-IN-CRS-C06-QU-007 (based on below standards) US EPA 3050B US EPA 3051A US EPA 3052 IEC 62321-5	Cr : 5 to1000 mg/kg
		Determination of Total Mercury Content	In house Methods SO-IN-CRS-C06-QU-007 (based on below standards) US EPA 3051A US EPA 3052 IEC 62321-4	5 to1000 mg/kg
		Screening Tests for Nickel presence (Spot test)	In house Methods SO-IN-CRS-C06-QU-002 (based on below standards) FD CR 12471	Visual Observation
		Leachable Cadmium	In house Methods SO-IN-CTS-C06-QU-011 (based on below standards) CPSC-CH-E1004-11	0.05 to100 mg/kg

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II.	PLASTIC AND PLASTIC PRODUCTS			
1.	Electro-Technical Products Restriction of Hazardous Substances (ROHS)	Flame Retardants - PBB (Polybrominated Biphenyl)	In house Methods SO-IN-CRS-C06-QU-006 (based on below standards)	50 to1000 mg/kg
		Monobromobiphenyl	IEC 62321-6	
		Dibromobiphenyl	US EPA 3540C	
		Tribromobiphenyl		
		Tetrabromobiphenyl		
		Pentabromobiphenyl		
		Hexabromobiphenyl		
		Heptabromobiphenyl		
		Octabromobiphenyl		
		Nonabromobiphenyl		
		Decabromobiphenyl		
		Flame Retardants - PBDE (Polybrominated Diphenyl Ether)	In house Methods SO-IN-CRS-C06-QU-006 (based on below standards)	50 to1000 mg/kg
		Monobromodiphenyl ether	IEC 62321-6 US EPA 3540C	
		Dibromodiphenyl ether		
		Tribromodiphenyl ether		
		Tetrabromodiphenyl ether		
		Pentabromodiphenyl ether		
		Hexabromodiphenyl ether		
		Heptabromodiphenyl ether		
	Octabromodiphenyl ether			

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		Nonabromodiphenyl ether		
		Decabromodiphenyl ether		
		HBCCD (Hexa Bromo Cyclo Decane)	In house Methods SO-IN-CRS-C06-QU-015	5 mg/kg to 50 mg/kg
		Determination of Hexavalent Chromium	In house Methods SO-IN-CRS-C06-QU-004 (based on below standards)	2 to1000 mg/kg
			US EPA 3060A	
			US EPA 7196A	
			IEC 62321-7-2	
		Determination of Total Lead Content & Total Cadmium Content	In house Methods SO-IN-CRS-C06-QU-007 (based on below standards)	5 to1000 mg/kg 5 to1000 mg/kg
			US EPA 3050B	
			US EPA 3051A	
			US EPA 3052	
			IEC 62321-5	
			CPSC-CH-E1002-8.3	
		Determination of Total Chromium Content	In house Methods SO-IN-CRS-C06-QU-007 (based on below standards)	5 to1000 mg/kg
			US EPA 3050B	
			US EPA 3051A	
			US EPA 3052	
			IEC 62321-5	
		Determination of Total Mercury Content	In house Methods SO-IN-CRS-C06-QU-007 (based on below standards)	5 to1000 mg/kg
			US EPA 3051A	
			US EPA 3052	
			IEC 62321-4	

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2.	Plastic Products	Determination of Total Cadmium Content	In house Methods SO-IN-CRS-C06-QU-003 (based on below standards) BS EN 1122	5 to 1000 mg/kg
3.	Plastic Materials & Articles	Global migration/Overall migration	In house Methods SO-IN-CRS-C06-QU-014, (based on below standards) BS EN1186-1 to15 AS 2070 IS 9845 European commission Directive's 10/2011 82/711/EEC 85/572/EEC 97/48/EC 93/8/EEC	2 to 10 mg/dm ²
4.	Automotive Components - Interior Parts	VOC (Volatile Organic Compounds)	In house Methods SO-IN-CRS-C06-QU-009 (based on below standards)	0.03 µg /TP to 100 µg /TP
		Formaldehyde	SES N 2403(article)	
		Acetaldehyde		
		Toluene		
		Total Xylene	In house Methods	
		Ethylbenzene	SO-IN-CRS-C06-QU-013 (based on below standards)	
		Styrene	NES M0402	
		Benzene		
		n-tetradecane		
		p-dichlorobenzene	ISO 12219-2	
		acrolin	JASO M902	
		TVOC		

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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
III.	TOYS & GAMES			
1.	Toys and Child Care Article (Plastic)	Phthalates	In house Methods SO-IN-CTS-C06-QU-009 (based on below standards) EN 14372(E) Clause 6.3.2 CPSC-CH-E1001-09.3 IEC 62321-8	
		Dibutyl Phthalate (DBP)		30 to 1000 mg/kg
		Benzylbutyl Phthalate (BBP)		30 to 1000 mg/kg
		Di-2-ethyl hexyl Phthalate (DeHP)		30 to 1000 mg/kg
		Di-n-octyl Phthalate (DnOP)		30 to 1000 mg/kg
		Diisononyl Phthalate (DiNP)		50 to 4000 mg/kg
		Diisodecyl Phthalate (DiDP)		50 to 4000 mg/kg
		Di-n-Hexyl Phthalate (DnHP)		30 to 1000 mg/kg
		Diisobutyl phthalate (DiBP)		30 to 1000 mg/kg
		Dicyclohexyl Phthalate (DCHP)		30 to 1000 mg/kg
		Di iso hexyl phthalate (DIHP)		50 to 4000 mg/kg
		Di iso pentyl phthalate (DIPP)		30 to 1000 mg/kg
		Di enthyl phthalate (DEP)		30 to 1000 mg/kg
	Di undecyl phthalate (DUDP)	30 to 1000 mg/kg		
	Di methyl phthalate (DMP)	30 to 1000 mg/kg		
	Di amyl phthalate (DAP)	30 to 1000 mg/kg		

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		Bis (2-methoxy ethyl) phthalate (DMEP)		30 to 1000 mg/kg
2.	Toy & Child Articles Scrapped off Material (Category-III)	Migration of certain elements- screening	In house Methods, SO-IN-CRS-C06-QU-001 (based on below standards)	
		Lead (Pb)		Pb : 5 to 1000 mg/kg
		Mercury (Hg)		Hg : 5 to 1000 mg/kg
		Cadmium (Cd)	BS EN 71-3	Cd : 5 to 1000 mg/kg
		Chromium (Cr)		Cr : 0.02 to 100 mg/kg
		Antimony (Sb)	IS 9873-3	Sb : 5 to 1000 mg/kg
		Arsenic (As)	ISO 8124-3	As : 5 to 1000 mg/kg
		Barium (Ba)	ASTM F963, Clause 8.3.1 & Clause 8.3.2	Ba : 5 to 1000 mg/kg
		h) Selenium (Se)		Se : 5 to 1000 mg/kg
		e) Aluminium (Al)		Al : 5 to 1000 mg/kg
		f) Boron (B)		B : 5 to 1000 mg/kg
		h) Cobalt (Co)		Co : 5 to 1000 mg/kg
		i) Copper (Cu)		Cu : 5 to 1000 mg/kg
		j) Manganese (Mn)		Mn : 5 to 1000 mg/kg
k) Nickel (Ni)		Ni : 5 to 1000 mg/kg		
l) Tin (Sn)		Sn : 5 to 1000 mg/kg		
m) Strontium (Sr)		Sr : 5 to 1000 mg/kg		
n) Zinc (Zn)		Zn : 5 to 1000 mg/kg		
3.	Tableware (Ceramic ware & Glass ware)	Determination of Leachable Lead & Cadmium	In house Methods SO-IN-CRS-C06-QU-008 (based on below standards)	0.05 to 100 mg/kg 0.05 to 100 mg/kg
			BS 6748	
			IS 9806	
			ISO 6486-1	
			ISO 6486-2	
			AOAC 973.32	
			AOAC 973.82	
			AOAC 984.19	
		ASTM C738		

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			BS EN 1388-1	
			BS EN 1388-2	
			DIN 51032	
IV.	PAINTS AND SURFACE COATING			
1.	Painted / Coated Items	Determination of Lead in Paint & Other Surface Coating	In house Methods SO-IN-CRS-C06-QU-005 (based on below standards)	5 to1000 mg/kg
			ASTM E1613	
			ASTM E1645	
			AOAC 974.02	
			CPSC-CH-E1003-09	
			ASTM F963, Clause 4.3.5.1(2)	
		Determination of Total Lead & Total Cadmium in liquid paint	In house Methods SO-IN-CRS-C06-QU-007 (based on below standards)	5 to1000 mg/kg 5 to1000 mg/kg
			ASTM E1613	
			ASTM E1645	
			AOAC 974.02	
			CPSC-CH-E1003-09	
			ASTM F963, Clause 8.3.5.7 (2)	

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ELECTRICAL TESTING

I.	ENVIRONMENTAL TEST FACILITY					
1.	All Electrical Appliances	Dry Heat Test	IS 9000-3, Sec 1 to 5 :1997 IEC 60068-2-2:2007	Qualitative 25 ° C to 180° C		
		Cold Test	IS 9000-2, Sec 1 to 4 :1997 IEC 60068-2-1:2007	Qualitative 25 ° C to -40°C		
		Damp Heat Test (Steady State)	IS 9000-4: 2008 IEC 60068-2-78:2012	Qualitative Temp : 20°C to 90°C, Rh : 20 to 95%		
		Damp Heat Test (Cycle)	IS 9000-5, Sec 1&2 : 1981 IEC 60068-2-30:2005	Qualitative Temp : 25°C to 90°C, Rh : 20 to 95%		
		Salt Mist Test	IS 9000-11:1983 IEC 60068-2-11:1981	Qualitative Temp: 23 °C to 60 °C, Humidifier temp. : 23°C to 60°C Rh : 20 to 95 %		
		Temperature cycling/ change of temperature	IS 9000-14, Sec 1 to 3 : 1988, Method Na & Nb EN 60068-2-14 : 2009, Cl. 7 & 8, Method Na & Nb	LxWxH mm 770 X 610 X 650 mm Qualitative Temp : -40°C to 180°C,		
		Vibration Test (Sine and Random)2000 Kgf	IS 9000-8 :1981 IEC 60068-2-6-2007 BS EN 60068-2-64:2008	Frequency : 10 to 2000 Hz, Acceleration : 15 g Displacement : 1mm to 50 mm p-p		
		Vibration Test (Sine and Random) 2000 Kgf	JIS D 1601:1995			
		2.	All Electronic Products	Dry Heat Test	IS 9000-3, Sec 1 to 5 :1997 IEC 60068-2-2:2007	Qualitative 25° C to 180° C

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		Cold Test	IS 9000-2, Sec 1 to 4 :1997 IEC 60068-2-1:2007	Qualitative 25° C to -40°C
		Damp Heat Test (Steady State)	IS 9000-4: 2008 IEC 60068-2-78:2012	Qualitative Temp : 20°C to 90°C, Rh : 20 to 95%
		Damp Heat Test (Cycle)	IS 9000-5, Sec 1&2 : 1981 IEC 60068-2-30:2005	Qualitative Temp : 20°C to 90°C, Rh : 20 to 95%
		Salt Mist Test	IS 9000-11:1983 IEC 60068-2-11:1981	Qualitative Temp:23°C to 60°C, Humidifier temp. : 23°C to 60°C Rh : 20 to 95 %
		Temperature cycling/ change of temperature	IS 9000-14, Sec 1 to 3 : 1988, Method Na & Nb EN 60068-2-14 : 2009, Cl. 7 & 8, Method Na & Nb	LxWxH mm 770 X 610 X 650 mm Qualitative Temp : -40°C to 180°C,
		Vibration Test (Sine and Random)	IS 9000-8 :1981 IEC 60068-2-6-2007 BS EN 60068-2-64:2008	Frequency : 10 to 2000 Hz, Acceleration : 15 g Displacement : 1mm to 50 mm p-p
		Vibration Test	JIS D 1601:1995	

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	Automotive Components - Interior & Exterior	Cyclic Corrosion Test	GMW 14872	Temperature : 23° C to 60°C Humidifier Temperature : 23° C to 75°C Humidity : 20 to 98% Mass Loss(Limit of Detection) : 0.001 g
2.	Ferrous & Non-Ferrous Metals & Alloys, Coated Products	Resistance to Corrosion	ASTM B117	Temperature : 23° C to 60°C
			ASTM G85, Annex A1	Humidifier Temperature : 23° C to 75°C
			ISO 9227	Mass Loss(Limit of detection) : 0.0001 g
			JIS Z 2371	
		Resistance to Corrosion-CASS Test	ASTM B368	Temperature : 23° C to 60°C Humidifier Temperature : 23° C to 75°C Mass Loss(Limit of detection) : 0.0001 g
		Rockwell Hardness Test	ASTM E18	20 - 88 HRA
			IS 1586	20 - 100 HRB
			ASTM A370	20 - 70 HRC
			ISO 6508-1	70 - 92 HR15N
				42 - 82 HR30N
				20 - 72 HR45N
				74 - 93 HR15T
				43 - 83 HR30T
			13 - 73 HR45T	

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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
		Vickers Hardness Test 1 - 50Kg Load	ASTM E92 IS 1501 ASTM A370 ISO 6507-1	50 - 900 HV
		Micro Vickers Hardness 10-1000g load.	ASTM E384 IS 1501 ASTM A370 ISO 6507-1	50 - 1000 HV
		Tensile Strength	IS 1608	Upto 1000kN
		Yield Strength	ASTM E8/E8M	Upto 1000kN
		% Elongation	ISO 6892-1	Upto 50%.
		% Reduction in Area	ASTM A370 JIS Z 2241	Upto 60%.
		Izod Impact Test	IS 1598	2 to 168 Joules (LC - 2 Joules)
		Charpy Impact Test (Charpy -V Notch)	IS 1757	2 to 300 Joules (LC - 2 Joules) (Ambient Temperature)
		Ericsson Cupping Test	IS 10175	Sheet Thickness 0.2 - 2.00 mm & Cupping Depth Up to 20 mm
		Crush Test	ASME (Sec II) (Part A) SA 370 , IS 3074, ASTM A370	Qualitative
		Nick Break Test	IS 3600 (Part 8)	Qualitative
		Bend Test	IS 1599, ASME (Sec II) (Part A) SA 370, ASTM E0290, ASTM A370, IS 3600 (Part 5), IS 3600 (Part 6), IS 3600 (Part 7), ISO 5173, AWS D1.1/D1.1M	Qualitative (Mandrel Diameter: 6 mm & 40 mm)

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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
		Re-Bend Test	ASME (Sec II) (Part A) SA 249	Qualitative
		Proof Strength	IS 1608, ASTM E8/E8M, ISO 6892-1, ASTM A370, JIS Z 2241	Upto 1000kN
		Charpy Impact Test (Charpy -V Notch)	IS 1757	2 to 300 Joules (LC - 2 Joules) (Ambient Temperature to (-)40 °C)
		Flattening Test	IS 2328, ISO 8492, ASME (Sec II) (Part A) SA 370, ASME (Sec II) (Part A) SA 450, ASTM A370	Qualitative
		Reverse Flattening Test	ASME (Sec II) (Part A) SA 370, ASME (Sec II) (Part A) SA 450, ASTM A370	Qualitative
		Flange Test	IS 2330, ISO 8494, ASME (Sec II) (Part A) SA 370, ASME (Sec II) (Part A) SA 450, ASTM A370	Qualitative
		Drift Expanding Test/ Flaring Test	IS 2335, ISO 8493, ASME (Sec II) (Part A) SA 370, ASME (Sec II) (Part A) SA 450, ASTM A370	Qualitative

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II.	METALLOGRAPHY TEST			
1.	Metallography Test	Average Grainsize	ASTM E112IS 4748	Grainsize No. 0 to 12 (Visual Observation)
		Inclusion content in steel	ASTM E45 IS 4163	Inclusion Rating : 0.5 to 3.0 (Visual Observation)
		Case Depth Measurement	IS 6416 ISO 2639	0.10 to 50 mm
		Depth of Decarburization	IS 6396	50 µm to 500 µm
		Macro Examination	ASM Handbook Vol-9, IS 13015, IS12573, IS11371, ASTM E340, ASTM E381-01	Qualitative (Visual Observation)
		Micro Examination	ASM Handbook Vol-9	50 X to 1000 X
		Coating Thickness	IS 3203, ASTM B487, ISO 2178, ISO 2360, ISO 2808, ASTM D7091, ISO 2177, ASTM B764, ASTM B504	0.75 Micron to 1300 Micron
		Determination of Volume Fraction of Phases	ASTM E562	50 X to 1000 X
		Nodularity and Nodule Count by Image Analysis	ASTM A247, IS 7754, ASTM E562, ASTM E2567	50 X to 1000 X
		Flake Type and Size Analysis	ASTM A247, IS 7754	50 X to 1000 X

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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
III.	PAINTED COMPONENTS			
1.	Painted Components	Mass of Zn coating	ASTM A90/90M, ISO 2808, IS 6745, DIN EN 10346	0.1 g/m ² to 3000 g/m ²
2.	Painted Panels & Products, Plated & Coated Products	Paint Adhesion	ISO 2409	Visual Observation
IV.	PLASTICS, RUBBER AND LEATHER			
1.	Automotive Components - Interior & Exterior & Plastic parts	Resistance to Heat Ageing	GMW 14650	(Temp range: -70°C to 220°C)/ (Visual observation)
		Resistance to Humidity Ageing	GMW 14650	(Humidity : 20% to 95%) / (Visual observation)
		Thermal Shock Testing	GMW 3172 (Clause 9.4.2) ES94100-05 (Clause 3.3)	(Temp range: -75°C to 220°C)/ (Visual observation)
		Weather ability or Fading Resistance for colour fastness to light	ASTM G 155 (Appendix-X2) SAE J 2527 ISO 105-B06 SAE J 2412	(BPT=38°C to 105°C Irradiance = 0.38 to 40 W/m ² Humidity = 20% to 95%) / (Visual observation with Grey Scale Rating)
		Resistance to Environmental Cycling Test	FLTM BQ 104-07 GMW 14650 GMW 14124 (Cycle M,Q,R,S,T,U,V) PV 2005, Variant A PV 1200 TSM 0502G, (Clause 4.1.3)	Min Inner volume = 700W x 610H x 650D mm Max Inner Volume = 2950W x 2100H x 1900D mm Temp: -70°C to 180°C Humidity : 20% to 95% / (Visual observation)

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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
		Ball Drop test	PV 3905	Stainless steel ball, Ø (50.0 ± 0.03) mm, (500 ± 5) g Height : 200 mm to 700 mm / (Visual observation)
		Stress Whitening Test	PV 3966	Stainless steel ball, Ø (50.0 ± 0.03) mm, (500 ± 5) g Height : 200 mm to 700 mm / (Visual observation)
		Fogging Resistance	SAE J 1756	Upto 100 % for reflection Fog Mass: 0.01 mg to 80 mg
		Flammability	ISO 3795	1 mm/min to 999 mm/min
			FMVSS 302	
			SAE J 369	
		Crocking	FLTM BN 107-1	Qualitative (Grade 1 to Grade 5)
2.	Automotive Insulation Materials & Interior Parts	Hot Odor Test for Insulation Materials	SAE J 1351	Olfactory Observation
3.	Plastic Materials	Density	ASTM D 792, ISO 1183-1	0.5 g/cc to 5 g/cc
		Specific Gravity	ASTM D 792	0.5 to 5.0
		Melt flow index	ISO 1133-1 & 2, ASTM D 1238	R: 0.15 g/10 min to 1500 g/10 min
		Izod Impact	ISO 180, ASTM D 256	R : 2.3 kJ/m ² to 148 kJ/m ² R : 0.6 kJ/m ² to 154 kJ/m ²
		Charpy Impact	ISO 179-1	R : 2.3 kJ/m ² to 202 kJ/m ²
		Ash content	ASTM D 5630, (Method B)	0.1 % to 75 %
			ISO 3451-1, (Method A)	

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