

<b>Laboratory</b>	<b>MRF R &amp; D – Corporate Technical, MRF Road, Tiruvottiyur, Chennai, Tamil Nadu</b>		
<b>Accreditation Standard</b>	<b>ISO/IEC 17025: 2005</b>		
<b>Discipline</b>	<b>Mechanical Testing</b>	<b>Issue Date</b>	<b>21.07.2015</b>
<b>Certificate Number</b>	<b>T-1083</b>	<b>Valid Until</b>	<b>20.07.2017</b>
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<b>S.No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
<b>I.</b>	<b>AUTOMOTIVE COMPONENTS</b>			
<b>1.</b>	<b>Component Testing (Plastics &amp; Rubber)</b>			
<b>a.</b>	<b>Truck &amp; Light Truck Tyres</b>	Endurance Test	AIS 044 (Part 1): 2004 IS 15636: 2012 IND/VEH/2079/2012 GS 646-1996 ECE :R 54-2013 FMVSS: 49 CFR 571.119-2011	47 hrs / 1 s  1961 N to 68647 N / 9.8 N (200 kgf to 7000 kgf / 1 kgf)  20 mph to 45 mph / 0.1 mph
		Highspeed (Load Speed Performace Test)	AIS :044 (Part 2): 2004 IS 15636: 2012 ECE :R 54-2013	1 hrs / 1s  1961 N to 39227 N / 9.8 N (200 to 4000 kgf / 1 kgf)  0 to 150 mph / 0.1 mph
		Tyre Strength (Plunger)	AIS 044 PART 1-2004 IS 15636: 2012 IND / VEH / 2079 / 2012 GS 646: 1996 FMVSS : 49CFR 571.119-2011	98067 N / 9.8 N (10000 kgf / 1 kgf)
<b>2.</b>	<b>Passenger Car Tyres</b>	Endurance Test	AIS 044 (Part 2): 2004 IS 15633: 2007 GS 53/1986 FMVSS: 49CFR 571.109-2011	34 hrs / 1s  1961 N to 29420 N / 9.8 N (200 kgf to 3000 kgf / 1 kgf)  20 mph to 75 mph / 0.1 mph
		Highspeed (Load Speed Performace Test)	AIS 044 (Part 2): 2004 IS 15636: 2005 GS 53/2007 FMVSS: 49CFR 571.109-2011 ECE: R 30 (2008)	1 hrs / 1 s  1961 N to 14710 N / 9.8 N (200 kgf to 1500 kgf / 1 kgf)  0 to 150 mph / 0.1 mph

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	<b>Passenger Car Tyres</b>	Tyre Strength (Plunger)	AIS 044 (Part 2): 2004 IS 15633: 2005 GS 53/2007 FMVSS: 49CFR 571.109-2011	9807 N / 9.8 N (1000 kgf / 1 kgf)
		Bead Unseat Test	AIS 044 PART 2-2004 IS 15633: 2005 GS 53/2007 FMVSS: 49CFR 571.109-2011	2000 N / 10 N
<b>3.</b>	<b>Two Wheeler and Three Wheeler Tyres</b>	Endurance test	AIS 044 (Part 3): 2009 IS 15627: 2005	34 hrs / 1 s  981 N to 9807 N / 9.8 N (100 kgf to 1000 kgf / 1 kgf)  20 mph to 100 mph / 0.1 mph
		Highspeed (Load Speed Performance Test)	AIS :044 PART 3-2009 IS 15627: 2005 ECE R :75-2010	1 hrs / 1s  981 N to 9807 N / 9.8 N (100 kgf to 1000 kgf / 1 kgf)  0 to 150 mph / 0.1 mph
		Tyre Strength (Plunger)	AIS 044 (Part 3): 2009 IS 15627: 2005	9807 N / 9.8 N (1000 kgf / 1 kgf)
<b>4.</b>	<b>Farm Tyres</b>	Hydroburst	ECE: R-106-2013	6.9 mN/mm <sup>2</sup> to 6.89 N/mm <sup>2</sup> / 10 N/mm <sup>2</sup> (1 to 1000 psi /20 psi)
<b>II.</b>	<b>PLASTICS, RUBBER AND LEATHER</b>			
<b>1.</b>	<b>Raw Rubber, Synthetic Rubber, SBR, IIR, EPDM, CIIR, CR</b>	Viscosity	ASTM D 1646-07 (RA 2012)	10 MU to 120 MU / 1 MU

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2.	<b>Compounded Rubber (Prevulcanisation Characteristics)</b>	Minimum Viscosity	ASTM D 1646-07 (RA 2012)	20.0 MU to 90.0 MU / 1 MU
		T 5		1.0 min to 30 min / 0.1 min
		T 35		2.0 min to 50 min / 0.1 min
		<b>(Vulcanisation Characteristics)</b>	Torque	ASTM D 5289-12
		Cure time		0.2 min to 120 min / 0.01 min
3.	<b>Vulcanized Rubber</b>	Durometer Hardness	ASTM D 2240-05 (RA 2010)	45 to 100 / 1 Duros
		Tensile testing	ASTM D 412 a Test Method A	5.50 to 35.00 / 0.10 MPa
		<b>Vulcanized Rubber</b>	Modulus	ASTM D 412 a Test Method A
		Elongation		50 to 700 / 1.00 %
		Accelerated ageing test: % Change in TS	ASTM D 573-04 (RA 2010)	(-) 100 to (+) 100 / 1.00
		% Change in EB		(-) 100 to (+) 100 / 1.00
<b>III. TEXTILES MATERIALS</b>				
1.	<b>Greige Tyre Cord</b>	Breaking Strength	ASTM D885M-10A (2014) e1	90 N to 4800 N / 0.1
		Elongation at Break		1 % to 50 % / 0.01
		Elongation @ Specified Load (Intermediate Elongation)		1 % to 50 % / 0.01

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2.	<b>Dipped Tyre Cord</b>	Elongation @ Break	ASTM D 885 M-10A1	1 % to 50 % / 0.01
		Elongation @ Specified Load (Intermediate Elongation)		1 % to 50 % / 0.01
		Breaking Strength		90 N to 4800 N / 0.1
		Thermal Shrinkage	ASTM D 4974-04 (2011)	1 % to 10 % / 0.1
3.	<b>Tyre Bead Wire</b>	Breaking Strength	ASTM D 4975-14	90 N to 4800 N / 0.1
		Elongation @ Break	ASTM D 4975-14	1 % to 50 % / 0.01
		Thickness		0.1 mm to 10 mm / 0.02
		Adhesion	ASTM D 1871-04 (2014)	100 N to 4800 N / 0.1
4.	<b>Steel Tyre Cord</b>	Breaking Strength	ASTM D 2969-04 (2014)	90 N to 4800 N / 0.1
		Lay Length		1 mm to 25 mm / 0.01
		Adhesion – Pull Out Force	ASTM D 2229-10 (2014)	100 N to 4800 N / 0.1

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