

Laboratory **Balkrishna Industries Limited, (BKT), A300-305, E306-313, RIICO Industrial Area, Chopanki, Bhiwadi, Rajasthan**

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

Certificate Number **TC-6521**

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Validity **15.11.2017 to 14.11.2019**

Last Amended on --

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.	RUBBER & RUBBER PRODUCTS			
1.	Natural Rubber (RSS , TSR)	Ash	ASTM D1278-91a (2015)	0.02 % to 5.00 %
		Dirt	ASTM D1278 - 91a(2015)	0.02 % to 5.00 %
		Volatile Matter	/ASTM D1278 - 91a(2015)/ASTM D297 – 15(2015)	0.02 % to 6.00 %
		Plasticity retention index (PRI)	ASTM D3194 – 17(2017)	20 % to 100 %
2.	Synthetic Rubber (SBR,PBR)	Ash	ASTM D5667 – 95 (2015) , ASTM D297-15(2015)	0.02 % to 5.00 %
		Volatile Matter	ASTM D5668 – 09(2014), /ASTM D1278 - 91a(2015)/ASTM D297 – 15(2015)	0.02 % to 10.00 %
		Microstructure of rubber	IS:10016 (Part4)- 1984(1984), ISO 21561-2:2016(2016)	10% to 99% of Cis content
		Oil content for Oil extended Rubber	ASTM D5774 - 95(2014)	0.5% to 70.0%
		Acetone Extraction	ASTM D297-15(2015)	1% to 50%
3.	Rubber Vulcanizates	1.Polymer identification by FT-IR	ASTM D3677-10 (2015)	4000 cm ⁻¹ to 650 cm ⁻¹
		2.Composition by TGA: a)Softner, b)Polymer c) Carbon Black d)Ash	ASTM D 6370-99(2014)	0 to 70% 25% to100% 0 to 110% 0 to 30%
		3.Cross link density	ASTM D6814-02(2013)	0.1 X 10 ⁻³ to 15.0X 10 ⁻³
		4.Sulphur content by Sulphur analyzer	ASTM D1619-16a(2016)	0.1% to 5.0%

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II.	INDUSTRIAL & FINE CHEMICALS			
1.	Filler (Carbon Black , Silica)	Volatile Content / Heating Loss	ASTM D1509 – 15(2015)	0.05 % to 25.00%
		Ash content	ASTM D4574 - 06(2017)/ASTM D1506 – 15(2015)	0.02 % to 25.00%
		pH	ASTM D6739 – 15(2015)/ASTM D1512 – 15b(2015)	1.00 to 14.00
		Ash Analysis (Insolubility in concentrated HCl)	ASTM D297 – 15(2015)	0.10 % to 99.90 %
		Sieve Residue / Fines Content	ASTM D1514 – 15(2015)/ASTM D1508:12(2012)	0.01% to 99.99%
		Oil Absorption No	ASTM D2414 – 16e1(2016)	20.0 to 150.0 ml/100 gm
		Iodine Adsorption Number	ASTM D1510 – 16a(2017)	20.0 to 150.0 mg/gm
		Pour density	ASTM D 1513:05-2012(2012)	0.200. gm/ml to 0.800 gm/ml
		Sulphur content by Sulphur analyzer	ASTM D1619-16a(2016)	0.10% to 5.0%
		Ash/Loss of Ignition	ASTM D4574 - 06(2017)	0.01 % to 50.00 %
2.	Oil (Aromatic)	Aniline Point for oil	ASTM D611 – 12(2016)	10.00 °C to 120.00 °C
		Kinematic viscosity of Transparent and Opaque Liquids	ASTM D445(2017a)	5.00 Cst to 100.00 Cst
		Sulphur content by Sulphur analyzer	ASTMD1552-16e1(2016)	0.01% to 40.00 %
		Density / Relative density by Hydrometer Methods	ASTM D1817 - 05(2016)/ASTM D1298 - 12b(2017)	0.10 gm/cc to 8.00 gm/cc
3.	Sulphur	Solubility/ insolubility	ASTM D1766 - 05(2016) / ASTM D4934 - 02(2017)	0.01 % to 99.99 %
		Melting Range	ASTM D1519 - 95(2014)	30 °C to 250°C

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		Wet Sieve Analysis of Sulphur	ASTM D4572 - 89(2017)	0.01% to 99.99 %
		Oil content In oil treated sulphur	ASTM D4573 - 03(2014)	1.00 % to 40.00%
		Solubility/ insolubility	ASTM D1766 - 05(2016) / ASTM D4934 - 02(2017)	0.01 % to 99.99%
		Thermal Reversion of Insoluble Sulphur	IS 14127-1995 (RA 2012)	1.00 to 98.00%
4.	Activator (ZnO , Stearic Acid)	ZnO Content	ASTM D297 – 15(2015)/ASTM D3280 - 85(2014)/IS 35-1975 (2012)	85.00 % to 99.99%
		Melting Range	ASTM D1519 - 95(2014)	30°C to 250°C
		Wet Sieve Analysis of Activator	ASTM D4572 - 89(2017)	0.01% to 99.99 %
		Ash content/ Loss of Ignition	ASTM D4574 - 06(2017)	0.01% to 100.00 %
		Acid Value	ASTM D 1980-87 (1998)	0.10 to 250.00
5.	Activator, Peptizer, Accelerator, Processing Aid, Antioxidant, Resin, Bonding Agent	Identification by TGA	ASTM D 6370-99 (2014)	50°C to 1000°C
		Identification by FT-IR (ATR)	ASTM D 2702:05 (2016)	4000 cm ⁻¹ to 650 cm ⁻¹
6.	Accelerator (CBS , TBBS , DCBS)	Ash content/ Loss of Ignition	ASTM D4574 - 06(2017)	0.01 % to 50.00 %
		Melting Range	ASTM D1519 - 95(2014)	30 °C to 250 °C
		Solubility/ insolubility	ASTM D1766 - 05(2016) / ASTM D4934 - 02(2017)	0.01 % to 99.99%
		Heating Loss	ASTM D6738 – 15(2015)/ASTM D1509 – 15(2015)	0.05 % to 25.00%
		% purity analysis by GC	ASTM D4937-96(2017)	0.10 % to 99.99 %
		Melting Range	ASTM D1519 - 95(2014)	30 °C to 250°C
		Ash content/ Loss of Ignition	ASTM D4574 - 06(2017)	0.01% to 50.00 %

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		Heating Loss	ASTM D6738 – 15(2015)/ASTM D1509 – 15(2015)	0.05% to 25.00%
		Acid Value	ASTM D 1980-87 (1998)	0.10 to 250.00
		Acetone Extraction	ASTM D297 – 15(2015)	0.10 % to 70.00 %
7.	Resin (SP-1068 , SPL 265)	Acid Value	ASTM D 1980-87 (1998)	0.10 to 250.00
		Melting Range	ASTM D1519 - 95(2014)	30 °C to 250°C
		Softening point	ASTM E28 – 14(2014)	50 °C to 150°C
		Ash content/ Loss of Ignition	ASTM D4574 - 06(2017)	0.01% to 50.00 %
8.	Dry Bonding Agent (HMMM , SCH)	Ash content	ASTM D4574 - 06(2017)	0.01 % to 50.00 %
		Heating Loss	ASTM D6738 – 15(2015)/ASTM D1509 – 15(2015)	0.05 % to 25.00%
		pH	ASTM D6739 – 11(2015)/ ASTM D 1512- 15b(2015)	1.00 to14.00
9.	Wax	Congealing point of wax	ASTM D938 – 12(2017)	1°C to 100°C
		Analysis of Petroleum Waxes by GC	ASTM D 5442-93(2017)	0.10 % to 99.99 %
		% purity analysis by GC	ASTM D4937-96(2017)	0.10 % to 99.99 %
10.	Processing Aid (MN-50 , RN44 , 40 MS)	Ash content	ASTM D4574 - 06(2017)	0.01 % to 50.00 %
		Melting Range	ASTM D1519 - 95(2014)	30°C to 250°C
		Softening point	ASTM E28 – 14(2014)	50°C to 150°C

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MECHANICAL TESTING

I.	TEXTILE MATERIALS			
1.	Yarn & Cords (Organic tire Chord)	Breaking Strength of conditioned yarns and cords	ASTM D885/D885M-10A(2014)e1,	5.09 kgf to 71.35 kgf
		Elongation at Break of conditioned yarns and cords	ASTM D885/D885M-10A(2014)e1,	2 % to 30 %
II.	RUBBER AND RUBBER PRODUCTS			
1.	Others			
a.	Steel tire Cord	Tensile Properties or Cord Breaking Force (Strength)	ASTM D2969-04 (2014)	100 N to 7000N
		Adhesion between steel tire cord and rubber	ASTM D2229-10 (2014)	10 Kgf to 407Kgf
		Linear Density	ASTM D2969 -04 (2014)	1.5 to 25 gm / meter
b.	Bead wire	Breaking Force	ASTM D4975-14(2014)	10 Kgf to 700 Kgf
		Breaking Elongation	ASTM D4975-14(2014)	3% to15 %
		Torsion resistance	ASTM D4975-14(2014)	10 to 70 Cycles
		Adhesion between tire bead wire and rubber	ASTM D1871-04 (2014)	10 Kgf to 400 Kgf
		Reverse Bend Test	IS 1716-1985 (1985)	5 Bends to 50 Bends
		Thickness/Diameter	ASTM D 1777-96(2015) , ASTM D2969-04(2014), ASTM D4975-14(2014)	0.1 mm to 6 mm
2.	Rubber vulcanizates			
a.	Cured rubber compounds, Tubes, Flaps	Tensile Strength	ASTM D412-15a(2016)	10 Kgf/cm ² to 400 kgf/cm ²
		Elongation at break	ASTM D412-15a(2016)	10 % to 800%
		Tear Strength	ASTM D624-00 (2012)	10 KN/m to 180 KN/m
		Thickness	ASTM D3767-03(2014)	1 mm to 10 mm

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		Durometer Hardness	ASTM D 2240-15(2015)	30 to 95 Shore A
		Abrasion resistance index	ASTM D5963-04 (2015)	50 to 150
		Heat generation in compression	ASTM D623-07 (2014)	1°C to 100°C
		Extension Cycling Fatigue	ASTM D4482-11(2011)	1 to 200 Kilocycle
		Rubber Deterioration by Heating in Air	ASTM D865-11(2011)	1% to 99%
		Rubber Deterioration Cracking in an Ozone Controlled Environment	ASTM D1149-16(2016), ISO 1431-1:2004(2004)	Qualitative Ranking
3.	Rubber Product			
a.	Tire	Outer Diameter	IS 15636: 2012(2012), ECE 106:2017(2017)/ ECE 54:2017(2017)/ ECE 75:2017(2017)	250 mm to 3000 mm
		Sectional width	IS 15636: 2012(2012), ECE 106:2017(2017)/ ECE 54:2017(2017)/ECE 75:2017(2017)	100 mm to 1050 mm
		Plunger Test (Breaking Energy)	IS 15636: 2012(2012), FMVSS 119	150 Joules to 3400 Joules
		Endurance Test	IS 15636: 2012(2012) ECE 106:2017(2017)/ ECE 54:2017(2017)/ECE 75:2017(2017)	Min. 47 Hrs to Till Failure or Min 1000 Km
		Assessment of tire resistance to bursting of "E" Mark tires (Bead burst test)	ECE106:2017(2017)	Hydraulic pressure-6~10 bar