

Laboratory	Spectro Research Lab Ventures (P) Ltd., G-3, Bajrangbali Industrial Area, Kanpur, Uttar Pradesh		
Accreditation Standard	ISO/IEC 17025: 2005		
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I. TEXTILE MATERIALS

1. Fabrics (Woven & Non Woven), Industrial Textile, Tyre Cord fabric	Breaking strength of woven textile fabrics (Ravelled Strip Method)	IS 1969-1985, (RA 1999)	10 to 5000 N
	Elongation of woven textile fabrics (Ravelled Strip Method)	IS 1969-1985, (RA 1999)	1 to 500 %
	Bursting strength & bursting distension of fabrics (Diaphragm Method)	IS 1966-1975, (RA 1999)	0.02 to 7 MPa
	Mass per unit length & mass per unit area of fabrics	IS 1964-2001, (RA2006)	10 to 300 gsm
	Threads per unit length in woven fabrics	IS 1963-1981, (RA 2004)	10 to 1000 dm
	Length & Width of woven fabrics	IS 1954-1990, (RA 2002)	1 to 2300 mm
	Creasing of textile Fabrics by measuring the angle of recovery	IS 4681-1981, (RA 2004)	30 to 180°
	Pilling resistance of fabric	IS 10971-1984, (RA1993)	Rating 1 to 5
	Breaking Strength for coated & treated fabric	IS 7016 (Part-2)-1981, (RA 2008)	100 to 5000 N
Extension at break for coated & treated fabric	IS 7016 (Part-2)-1981, (RA 2008)	1 to 500 %	

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		Tearing Resistance by the falling pendulum method	IS 6489-1993, (RA 2008)	240 to 5440 g
		Thickness of Woven & Knitted Fabric	IS 7702-1975, (RA 2006)	0.002 to 5 mm
		Assessment of fabric drape	IS 8357-1977, (RA 2008)	15 to 85
		Resistance to damage by Flexing	IS 7016 (Part-4)-2003 (RA 2009)	Qualitative
		Colour fastness to Hot pressing of textile material	IS 689-1988 (RA 2004)	Rating 1 to 5
		Resistance to low temperature (at -40°C for 6 hours)	DMSRDE/TEX-3(P)2001/1	Qualitative
2.	Hook & Loop	Shear strength (Length & Width Wise)	IS 8156-1994 (RA 1999) (Annexure-E)	50 to 45000 g/cm ²
		Peel strength	IS 8156-1994 (RA 1999) (Annexure-E)	50 to 45000 g/cm
		Endurance Test	IS 8156-1994 (RA2009) (Annexure-G)	Qualitative
3.	Zipers & Fastners	Reciprocating Movement of slider under load	IS 14181 (Part-2)-2002, (RA2007) (Annexure-K)	Qualitative
		Resistance to heat under Load	IS 14181 (Part-2)-2002, (RA2007) (Annexure-M)	Qualitative

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		Resistance to abrasion under Load	IS 14181 (Part-2)-2002, (RA2007) (Annexure-L)	Qualitative
		Fold over Security of textile chain	IS 14181 (Part-2)-2002, (RA2007) (Annexure-C)	10 to 4000 N
		Security of attachment of bottom stop	IS 14181 (Part-2)-2002, (RA2007) (Annexure-E)	1 to 4000 N
4.	Yarn, Fibres	Lea Strength	IS 1671-1977, (RA2004)	10 to 400 kg
		Tenacity of Sewing Thread	IS 1670-1991, (RA2002)	0.5 to 50 g/d
		Crimp of yarn	IS 3442-1980, (RA2004)	2 to 200%
		Count of yarn	IS 3442-1980, (RA2004)	1 to 140 Ne
		Twist/Turns per meter in yarn	IS 832-1985, (RA1999)	50 to 2000
		Linear Density	IS 1315-1977, (RA1999), IS 7703 (Part-1)-1990, (RA2002)	1 to 140 Ne
		Breaking strength	IS 1670-1991, (RA 2002)	2 to 800 N
		Elongation	IS 1670-1991, (RA 2002)	5 to 500 %

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II. PAPER & PAPER PRODUCTS

1. Paper, Paper Board & Specially Paper, Composite Packing Material	Substance or ream weight	IS 1060 (Part-1)-1966, (CI-6)	20 to 1000 g/m ²
	Thickness	IS 1060 (Part-1)-1966, (CI-7)	0.002 to 5 mm
	Bursting Strength	IS 1060 (Part-1)-1966, (CI-12.5)	0.1 to 7 MPa

III. MECHANICAL PROPERTIES OF MATERIALS

1. Metals (Ferrous & Non Ferrous)	Tensile Test		
	Tensile strength	IS 1608-2005, ASTM A 370-12a, ASME Section IX-2010	20 to 400 kN
	Yield stress/0.2% proof stress	IS 1608-2005, ASTM A 370-12a, ASME Section IX-2010	20 to 320 kN
	Elongation	IS 1608-2005	2 to 80 %
	Reduction of Area	IS 1608-2005	2 to 80%
	Impact, Charpy (V) (0-40°C)	IS 1757-1988, ASTM A370-12a, ASME SEC IX-2010	2 J to 300 J
	Rockwell Hardness (B Scale)	IS 1586- 2000, (RA 2006), ASTM A 370-12a	30 to 99 HRB

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2.	Metals (Ferrous)	Rockwell Hardness (C Scale)	IS 1586- 2000 (RA 2006), ASTM A 370-12a	20 to 65 HRC
3.	Metals (Ferrous & Non Ferrous)	Bend test	IS 1599- 1985 (RA 2006), ASTM A 370-12a, ASME Section IX-2010	Mandrel Size: 12 mm, 20 mm, 24 mm, 30 mm, 36 mm, 50 mm, 70 mm, 80 mm, 90 mm, 100 mm
Hardness (HBW)		IS 1500- 2005	30-450 HBW	
Vickers Hardness		IS 1501-2002	20 – 1500 (HV5, HV10 & HV30)	
Shear Strength		IS 5242-1979	1 to 2500 MPa	
4.	Metals (Ferrous)	Flattening test	IS 2328- 2005	OD: 100 mm, Thickness: 32 mm
Flaring test (Drift expending test)		IS 2335- 2005	OD: 100 mm, Thickness: 32 mm	
Wrapping Test		IS 1755-1985 (RA 2006)	0.1 to 4 mm	
Torsion Test		IS 1717-1985 (RA 2006)	1 to 100	
Cupping test		IS 10175 (Part-1) 1993	0.01 to 25.0 mm	
Rebend test		IS 1786-2008	Mandrel Size: 12 mm, 20 mm, 24 mm, 30 mm, 36 mm, 50 mm, 70 mm, 80 mm, 90 mm, 100 mm	

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IV. METALLOGRAPHY TEST

1. Metallographic Examination of metals	Decarburised Depth	IS 6396-2000, (RA 2007)	0.05 to 10 mm
	Inclusion Rating	IS 4163-2004	0.5 to 3 (at 100X)
	Macro Examination	IS 13015-1991, (RA 2007), ASTM E 340 (2006), ASTM E381-01 (2010), IS 4748-2009, ASM-9-2004	Qualitative
	Grain Size	ASTM E112-12, IS 4748-2009 (Comparison Method)	ASTM No. 1-10 & average grain size in mm
	Micro Structure	ASTM A800-2010, ASM-9-2004	Qualitative

V. PLASTICS, RUBBER & LEATHER

1. Rubber	Tensile Strength	IS 3400 (Part-I) 1987 (RA 1998), ASTM D412-06a (2013)	1 to 25 MPa
	Elongation at break	IS 3400 (Part-I) 1987 (RA 1998), ASTM D412-06a (2013)	1 to 900 %
	Compression Set	IS 3400 (Pt-X) 1977 (RA 1998), ASTM D395-03(2008)	10 to 80%
	Hardness (Shore-A)	IS 13360 (P5/Sec-11) 1992 (RAea 2003), ASTM D2240-05 (2010)	10 to 90

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		Air ageing Test	IS 13360 (Part-5/Sec-11) 1992 (Rea 2003), ASTM D573-04 (2010)	40 to 200°C
		Change in Tensile Strength After Air Ageing	IS 3400 (Part-I) 1987, (RA 1998), ASTM D 412-06a (2013)	-40 to +20%
		Change in Elongation after Air ageing	IS 3400 (Part-I) 1987 (RA 1998), ASTM D 412-06a (2013)	-60 to +10%
		Change in Hardness (Shore-A) after Air Ageing	IS 13360 (P5/Sec-11) 1992 (Rea 2003), ASTM D 2240-05 (2010)	-10 to +10
		Effect of liquids	ASTM D471-12a	0.5 to 80%
		Density	IS 3400 (Part-9)-2004, (RA2008)	0.5 to 5 g/cc
		Hardness (IRHD)	IS 3400 (Part-2)-2004, (RA2008), ASTM D 2240-05 (2010)	20 to 100
		Resistance to Flexing	IS 3400 (Part-16)-1974, (RA2006)	100 to 150000 cycles
		Cut growth after Flexing	IS 3400 (Part-16)-1974, (RA2006)	50 to 400 %

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2.	Latex Foam	Indentation hardness test	IS 1741-1960, (RA 2003) (App-A)	10 to 300 Index
3.	Rubberized Coir	Indentation hardness (Original)	IS 8391-1987, (RA2004) (App-A)	2 to 300 Index
		Indentation hardness (After Flexing)	IS 8391-1987, (RA2004) (App-D)	10 to 300 Index 100000 Cycles
4.	PU Foam	Indentation Load Deflection	IS 7888-1987 Clause-6	0.015 to 0.92 kg/cm ²
5.	Plastics, HDPE	Tensile Strength	IS 13360 (Part-5/Sec-1) 2004, ASTM D 638-08	1 to 300 Mpa
		Elongation	IS 13360 (Part-5/Sec-1) 2004, ASTM D 638-08	1 to 800 %
		Flexural Properties	IS 13360 (Part-5/Sec-7) 1996 (RA 2008), ASTM D 790-10	0.05 to 30 MPa
		Water Absorption	ASTM D 570-98 (2010)	0.01 to 50%
		Hardness (Shore-A/Shore-D)	IS 13360 (Part-5/Sec-11) 1992 (Rea 2003), ASTM D 2240-05 (2010)	10 to 90
		Specific Gravity/Density	ASTM D 792-13	0.2 to 5 g/cc

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6.	Phenolic Laminated Sheet	Cross Breaking Strength	IS 2036-1995 (Annx-A)	1 to 300 MPa
		Shear strength (Flatwise)	IS 2036-1995 (Annx-C)	1 to 150 MPa
		Water Absorption	IS 2036-1995 (Annx-D)	1 to 4000 mg
7.	Leather	Thickness of leather Units	IS 5914 (LP-2) 1970, (RA 2003)	0.01 to 10 mm
		Apparent Density	IS 5914 (LP-5) 1970, (RA 2003)	0.1 to 2.0 g/cc
		Tensile Strength	IS 5914 (LP-6) 1970, (RA 2003)	1 to 45 MPa
		Elongation at break	IS 5914 (LP-6) 1970, (RA 2003)	1 to 100%
		Tongue Tear Test	IS 5914 (LP-9) 1970, (RA 2003)	10 to 5000 N
		Shrinkage temperature	IS 5914 (LP-10) 1970, (RA 2003)	25 to 250°C
		Double Hole Stitch Tear Strength	IS 5914 (LP-8)-1970, (RA2009)	1 to 250 N/mm
		Tear Strength	IS 5914 (LP-7)-1970, (RA2009)	1 to 250 N/mm
		Flexing Endurance	IS 5914 (LP-19)-1970, (RA2009)	Qualitative
		Heat Resistance for shoe upper leather for direct Molding Process	IS 5677 (Appendix-A)-1986, (RA2009)	Qualitative
	Water Absorption (Gravimetric method)	IS 5914 (LP-11)-1970, (RA 2009)	10 to 90 %	

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8.	Complete Footwear	Adhesion/Bond Strength	IS 8085 (Part-1)-1986, (RA2007)	5 to 850 N
		Shape Retention of toe caps (% of initial height)	IND/TC/3838 (K) (Annexure-B)	1 to 50%
		Peel Strength	IND/TC/3838 (K) (Annexure-A)	0.1 to 10 N/cm
VI.	Paints, Enamels & Varnishes	Flexibility & Adhesion tests		
		a) Bend Test	IS 101 (Part-5/Sec2)-1988/ RA 1999	Qualitative
		b) Scratch Hardness		Qualitative
		Drying time		
		a) Surface Dry	IS 101 (Part-3/Sec1)-1986 (RA 2001)	10 to 600 Min
		b) Hard dry		1 to 24 hrs
		c) Tack Free		1 to 30 hrs
		Consistency	IS 101 (Part-1/Sec5)-1989, (RA 1999)	Qualitative
Finish	IS 101 (Part-3/Sec4)-1987, (RA 2004)	Qualitative		
Stripping test	IS 101 (Part-5/Sec2)-1987, (RA 2004)	Qualitative		
Color	IS 101 (Part-4/Sec-2)-1989 (RA 1999)	Observation		

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VII. BUILDING MATERIALS

1. Cement	Consistency	IS 4031 (Part-4) 1988, (RA 2009)	10 to 50 %
	Setting Time	IS 4031 (Part-5) 1988, (RA 2009)	30 to 900 Minutes
	Compressive Strength	IS 4031 (Part-6) 1988, (RA 2009)	10 to 80 N/mm ²
	Fineness Blaine	IS 4031 (Part-2) 1999, (RA 2008)	50 to 600 m ² /kg
	Soundness (Le-chatelier)	IS 4031 (Part-3) 1988, (RA 2009)	0.01 to 20 mm
	Soundness (Autoclave)	IS 4031 (Part-3) 1988, (RA 2009)	0.01 to 5 %
	Drying Shrinkage	IS 4031 (Part-10) 1988, (RA 2009)	0.01 to 0.5 %
	Density	IS 4031 (Part-11) 1988, (RA 2009)	2 to 3.5
	Fineness by dry sieving	IS 4031 (Part-1) 1996, (RA 2005)	0.05 to 20 %
2. Pozzolana Material (Fly Ash)	Fineness (Specific Surface) Blaine's	IS 1727 1967, (RA 2008)	50 to 800 m ² /kg
	Particle retained on 45 micron IS Sieve(wet sieving)	IS 1727 1967, (RA 2008)	0.05 to 50 %
	Density	IS 1727 1967, (RA 2008)	1.00 to 3 g/cc
	Soundness by (Autoclave Expansion)	IS 1727 1967, (RA 2008)	0.02 to 10%
	Lime reactivity	IS 1727 1967, (RA 2008)	1 to 90 N/mm ²

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3.	Coarse & Fine Aggregates	Particle size	IS 2386 (Part-1) 1963, (RA 2007)	0.075 to 125 mm
		Crushing Value	IS 2386 (Part-4) 1963, (RA 2007)	10 to 50 %
		Impact Value	IS 2386 (Part-4) 1963, (RA 2007)	10 to 50 %
		Flakiness Index	IS 2386 (Part-1) 1963, (RA 2007)	1 to 50 %
		Elongation Index	IS 2386 (Part-1) 1963, (RA 2007)	1 to 50 %
		Soundness	IS 2386 (Part-5) 1963, (RA 2007)	0.1 to 20 %
		10% Fine Value	IS 2386 (Part-4) 1963, (RA 2007)	1 to 50 Ton
		Moisture Absorption	IS 2386 (Part-3) 1963, (RA 2007)	0.1 to 20 %
		Specific Gravity	IS 2386 (Part-3) 1963, (RA 2007)	1.5 to 3.5
		Bulk Density	IS 2386 (Part-3) 1963, (RA 2007)	1 to 2.5 kg/l
		Deleterious Material	IS 2386 (Part-2) 1963, (RA 2007)	0.1 to 20 %
		Abrasion Value (Los Angeles)	IS 2386 (Part-4) 1963, (RA 2007)	0.1 to 50 %
		Organic Impurities	IS 2386 (Part-2) 1963, (RA 2007)	Qualitative
Silt Clay and Fine Dust	IS 2386 (Part-2) 1963, (RA 2007)	0.01 to 10 %		

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4.	Concrete	Compressive Strength	IS 516-1959	10 to 100 N/mm ²
5.	Fire and Silica Refractory Materials	Apparent Porosity	IS 1528 (Part-15) 1998, (RA 2007)	2 to 50 %
		Bulk Density	IS 1528 (Part-12) 1974, (RA 1997), ASTM C134-95	100 to 4000 kg/m ³
		Reheat Change of Refractory Brick	ASTM C113-93	0.01 to 2%
		Cold Crushing Strength	ASTM C133-97	2 to 100 N/mm ²
		Specific Gravity	IS 1528 (Part-9) 1995	1.5 to 5.0
		Water Absorption	IS 1528 (Part-9) 1995	0.1 to 20 %
6.	Building Bricks	Compressive Strength	IS 3495 (Part-1) 1992, (RA 2007)	1 to 30 Mpa
		Water Absorption	IS 3495 (Part-2) 1992, (RA 2007)	5 to 30%
		Efflorescence	IS 3495 (Part-3) 1992, (RA 2007)	Qualitative
		Dimension	IS 1077-1992	40 to 5000 mm
7.	Plywood	Moisture Content	IS 1708 (Part-1)-1983 (RA 2003)	0.1 to 20%
		Water Resistance Test (Adhesion of Plies)	IS 1734 (Part-6) 1983 (RA 2003)	Qualitative

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		Glue Shear Strength (Dry State)	IS 1734 (Part-4) 1983	10 to 3000 N
		Density	IS 1734 (Part-1)1983	10 to 200 kg/m ³
		Tensile Strength (Along the grain & across the grain)	IS 1734 (Part-9) 1983, (RA 2003)	1 to 500 N/mm ²
8.	Wood Particle Boards & Boards from other lignocellulosic Material	Moisture Content	IS 2380 (Part-3) 1977, (RA 2008)	0.1 to 20%
		Density	IS 2380 (Part-3) 1977, (RA 2008)	10 to 100 kg/m ³
		Tensile Strength (Perpendicular & parallel to surface)	IS 2380 (Part- 5& 6) 1977, (RA 2008)	1 to 500 N/mm ²
		Water Absorption	IS 2380 (Part-16) 1977, (RA 2008)	0.1 to 50%
		Dimension	IS 2380 (Part-2) 1977, (RA 2008)	1 to 3000 mm
		Swelling in water	IS 2380 (Part-17)1977, (RA 2008)	0.1 to 20%
9.		Block Board, Flush Door & Door Shutters	End Immersion Test	IS 4020 (Part-13):1998
	Knife Test		IS 4020 (Part-14):1998	Qualitative
	Glue Adhesion Test		IS 4020 (Part-15):1998	Qualitative
10.	Timber	Moisture Content	IS 1708 (Part-1)-1986	0.1 to 30%

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