

<b>Laboratory</b>	<b>United Solutions Private Limited, Testing Division, C-245, Village-Allour, Tehsil-Khanna, Dist.- Ludhiana, Punjab</b>		
<b>Accreditation Standard</b>	<b>ISO/IEC 17025: 2005</b>		
<b>Discipline</b>	<b>Mechanical Testing</b>	<b>Issue Date</b>	<b>12.04.2014</b>
<b>Certificate Number</b>	<b>T-2209</b>	<b>Valid Until</b>	<b>11.04.2016</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>1.</b>	<b>MECHANICAL PROPERTIES OF MATERIALS</b>			
<b>1,</b>	<b>Ferrous and Non Ferrous Alloy (Bars, Wires, Sheets, Strips, Structural Steel, Tubular Steel, Tor, TMT, Fasteners)</b>	Tensile Strength	IS:1608:2005	10-1000 N/mm <sup>2</sup>
		Yield Strength		10-750 N/mm <sup>2</sup>
		0.2% Proof Stress		
		%Elongation		1-40 %
		Bend Test	IS:1599:2012 IS:2329:2005	Mandrel size 12, 16, 18, 20, 24, 30, 32, 36, 40, 48, 50, 60, 64, 75, 80, 84, 96, 100, 108, 112, 120, 125, 128, 140, 144, 160, 168, 180, 192, 200, 216, 240 mm
		Re- Bend Test	IS:1786:2008	Mandrel size 24, 30, 32, 36, 40, 42, 48, 50, 56, 60, 70, 72, 84, 96, 112, 120, 128, 140, 150, 160, 168, 175, 192, 196, 200, 216, 224, 240, 252, 256, 228, 288, 320 mm
		Charpy Impact Test	IS:1757-1988 RA-2003	1-300 Joules
		Hardness		
		Rockwell HRB	IS:1586 (Pt-1)-2012	Upto 100 HRB
		Rockwell HRC	IS:1586 (Pt-1)-2012	Upto 100 HRC
	Brinell BHN	IS:1500:1983 RA-2005	Upto 350 HB	
<b>2.</b>	<b>HSD Bar &amp; Rod</b>	<b>Bond Test:</b>	Cl 5.0 of IS:1786-2008	Upto 15mm <sup>2</sup> /mm
		- Deformation & Surface Characteristic	Cl-5.7 of IS:1786-2008	
		- Pullout Test	IS: 2770 (Pt-1)-1967 RA-2007	10 -100 N/mm <sup>2</sup>
<b>3.</b>	<b>Wires</b>	Reverse Bend Test	IS:1716:1985 RA-2006	0.3-10 mm

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		Wrapping Test	IS:1755:1983 RA-2006)	Upto 5mm Dia
4.	Steel Tubes	Mass	IS: 1239 (Pt -1)-2004 IS: 1161-1998(RA-2003) IS: 4923-1997 (RA-2003) IS: 3589-2001 (RA-2006) IS: 4270-2001 IS: 3601-2006 IS: 1978-1982 (RA-2003) IS: 9295-1983 (RA-2003)	5gm - 6kg 1 - 200 kg 5 - 500 kg
5.	HSD Bar Wire	Mass	IS: 1786-2008 IS: 432(Pt -1)-1982 (RA-2004)	5gm - 6kg 1- 200 kg 5 - 500 kg
6.	Structural Steel, Flats & Sheets	Mass	IS: 2062-2011 IS: 10748-2004 IS: 1079-2009	5 gm - 6kg 1- 200 kg 5- 500 kg
7.	Steel Pipes & Tubes	Linear Measurements (Diameter, Thickness Length )	IS: 1239 (Pt -11)-2004 IS:1239 (Pt -12)-2011 IS: 1161-1998 (RA-2003) IS: 4923-1997 (RA-2003) IS: 3589-2001 (RA-2006) IS: 4270-2001 IS: 3601-2006 IS: 1978-1982 (RA-2003) IS: 9295-1983 (RA-2003) IS: 11722-1986 (RA-2003)	0.05 - 25 mm 0.10 - 50 mm 0.50 - 150mm 0.50 - 200 mm 1.00 - 300 mm 5.00 - 600mm 10 - 1000 mm 10 - 1000 mm 500 -3000 mm
	Steel Pipe , Tubes	Hydrostatic Test	IS: 1239 (Pt -1)-2004 IS:1239 (Pt -2)-2011 IS: 1161-1998(RA-2003) IS: 4923-1997(RA-2003) IS: 3589-2001(RA-2006)	0.0098-13.729 MPa

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			IS: 4270-2001 IS: 3601-2006 IS: 1978-1982(RA-2003) IS: 9295-1983(RA-2003) IS: 11722-1986(RA-2003)	
	<b>Pipes &amp; Tubes</b>	Flattening Test	IS: 2328-2005	Upto 1000 mm
	<b>Pipes , Tubes &amp; Sockets</b>	Drift Expansion Test	IS : 2335-2005	Upto 150 mm
<b>8.</b>	<b>HSD Bar Wires</b>	Linear Measurements (Diameter, Length)	IS: 1786-2008 IS: 432 (Pt -1)-1982(RA-2004) IS: 432(Pt -2)-1982(RA-2004) IS: 280-2006 IS: 278-2009	0.05 - 25 mm 0.10 - 50 mm 0.50 - 150mm 0.50 - 200 mm
<b>9.</b>	<b>Structural Steel Flats &amp; Sheets</b>	Linear Measurements (Width,Thickness & Length)	IS: 2830-2012 IS: 2831-2012 IS: 2062-2011 IS: 10748-2004 IS: 1079-1994(RA-2003) IS: 7452-1990(RA-2003)	0.05 - 25 mm 0.10 - 50 mm 0.50 - 150mm 0.50 - 200 mm 1.00 - 300 mm 5.00 - 600 mm
<b>10.</b>	<b>Fasteners</b>	Proof Load for Nut	IS: 1367 (Pt-6)-1994 (RA-2004)	10-1000 kN
		Wedge Load for Bolt	IS: 1367 (Pt-3)-2002	10-1000 kN
		Thread Gauging	IS:4218 (Pt-2):2001	M5- M 64
		Linear Measurements (Dimensions)	IS: 1363 (Pt-I)- 2002 IS: 1363 (Pt-2)- 2002 IS: 1363 (Pt-3)- 2002 IS: 1364 (Pt-I)- 2002 IS: 1364 (Pt-2)- 2002	0.05 - 25 mm 0.10 - 50 mm 0.50 - 150mm 0.50 - 200 mm

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			IS: 1364 (Pt-3)- 2002 IS: 4003 (Pt-1)- 1978 IS: 4003 (Pt-2)- 1986 IS: 3650-1981(RA-2005) IS: 2028-2004	
	<b>Fasteners</b>		IS: 2029-1998(RA-2006) IS:6149-1984(RA-2005) IS:12427-2001 IS:204 (Pt-1)-1991(RA-2006) IS:6639-1972(RA-2006)	0.05 - 25 mm 0.10 - 50 mm 0.50 - 150mm 0.50 - 200 mm
<b>II. BUILDING MATERIALS</b>				
<b>1.</b>	<b>Structural Steel Window Sections</b>	Angular Measurement (Camber, Web off Centre & Sweep)	IS :1852:1985(RA-2003) IS :7452:1990(RA-2003)	Upto 10 mm
<b>2.</b>	<b>TIMBER PANELLED MATERIALS Plywood for general purposes,</b>	Dimensions	IS:303-1989 (RA-2003) IS:1659-2004 IS:4020 (Pt -2)-1998 IS:710-2010 IS:4990-2011 IS:1328-1996 (RA-2007)	0.01-2500 mm
		Water Resistance Test	IS:1734(Pt -4)-1983(RA-2003) IS:1734(Pt -6)-1983(RA-2003) IS:1328-1996(RA-2007) IS:1659:2004 IS:303-1989(RA-2003) IS:710-2010 IS:4990-2011	20 - 99 °C
		Moisture Content	IS:1734 (Pt -1)-1983 (RA-2003)	1- 30 %
	<b>TIMBER</b>	Static Bending Strength	IS:1734 (Pt -11)-1983	10- 8000 N/mm <sup>2</sup>

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	<b>PANELLED MATERIALS</b>		(RA-2003)	
	<b>Plywood for general purposes,</b>	Wet Bending Strength	IS:1734 (Pt -11)-1983 (RA-2003)	10- 5000 N/mm <sup>2</sup>
<b>3.</b>	<b>Block Board</b>	Dimensional Changes cause by humidity	IS:1659-2004	Upto 5 mm
		Adhesion of Plies	IS:1659-2004 IS:1734(Pt -5)-1983 (RA-2003)	Visual
		Modulus of Rapture	IS:1659-2004	10 - 100 N/mm <sup>2</sup>
		Modulus of Elasticity	IS:1659-2004	10 - 8000 N/mm <sup>2</sup>
		Spot Test	IS:1659-2004	Visual
<b>4</b>	<b>Flush Door</b>	General Flatness Test	IS:4020 (Pt -3)-1998	0-10mm
		Local Plainness Test	IS:4020(Pt -4) -1998	0.1 - 1.0 mm
		Impact Indentation Test	IS:4020(Pt -5) -1998	0.1 - 0.2 mm
		Flexure Test	IS:4020(Pt -6) -1998	1 - 75 mm
		Edge Loading Test	IS:4020(Pt -7) -1998	0.1 - 10 mm
		Shock Resistance Test	IS:4020 (Pt -8) -1998	Visual
	<b>Flush Door</b>	Buckling Test	IS:4020 (Pt -9) -1998	1-40 mm
		Slamming Test	IS:4020 (Pt -10) -1998	Visual
		Misuse Test	IS:4020 (Pt -11) -1998	Visual
		Varying Humidity Test	IS:4020 (Pt -12) -1998	0.1- 1 mm
		End Immersion Test	IS:4020 (Pt -13) -1998	Visual

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		Knife Test	IS:4020 (Pt -14) -1998 IS:1734 (Pt -5) -1983(RA-2003)	Visual
		Glue Adhesion Test	IS:4020 (Pt -15) -1998	Visual
		Screw Withdrawal Resistance Test	IS:4020 (Pt -16) -1998	10- 4000 N/mm <sup>2</sup>
<b>5.</b>	<b>Marine Plywood Shuttering Plywood</b>	Glue Shear Strength	IS:1734 (Pt-4)-1983(RA-2003)	10 - 1500 N/mm <sup>2</sup>
		Retention of Preservative	IS:2753 (1&2)-1991 (RA-2005)	Upto 15 kg/m <sup>3</sup>
		Tensile Strength	IS: 1734(Pt-9)-1983(RA-2003)	10- 60 N/mm <sup>2</sup>
<b>6.</b>	<b>Cement</b>	<b>Setting Time Initial &amp; Final</b>	IS: 4031(Pt-5)-1988(RA-2005)	5- 700 minutes
		Standard Consistency	IS: 4031(Pt-4)-1988(RA-2005)	20 - 40%
	<b>Cement</b>	Fineness by Specific Surface area	IS: 4031(Pt-2)-1999(RA-2004)	200 - 500 m <sup>2</sup> /kg
		Soundness by Le – Chatelier Method	IS: 4031(Pt-3)-1988(RA-2005)	0.5 – 5 mm
		Soundness by Autoclave	IS: 4031(Pt-3)-1988(RA-2005)	0.01 - 5.0%
		Compressive Strength	IS: 4031(Pt-6)-1988(RA-2005)	0.5- 100 N/mm <sup>2</sup>
		Drying Shrinkage	IS: 4031(Pt-10)-1988 (RA-2005)	0.01 - 4.8%
<b>7.</b>	<b>Concrete Cube</b>	Compressive Strength	IS: 516-1959 (RA-2004)	0.5 - 80 N/m <sup>2</sup>
<b>8.</b>	<b>Aggregate</b>	Flakiness Index	IS:2386 (Pt-1)-1963 (RA-2007)	Upto 60%
		Elongation Index	IS:2386 (Pt-1)-1963 (RA-2007)	Upto 60%

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		Bulk Density	IS:2386 (Pt-1)-1963 (RA-2007)	1000-2500 kg/m <sup>3</sup>
		Specific Gravity	IS:2386 (Pt-3)-1963(RA-2007)	2-3
		Water Absorption	IS:2386 (Pt-3)-1963(RA-2007)	0.2-5%
		Crushing Value	IS:2386 (Pt-4)-1963 (RA-2007)	10-40%
		Impact Value	IS:2386 (Pt-4)-1963(RA-2007)	10-40%
		Los Angles, Abrasion	IS:2386 (Pt-4)-1963 (RA-2007)	10-40%
	<b>Aggregate</b>	10% Fine Value	IS:2386 (Pt-4)-1963(RA-2007)	5-20%
		Soundness	IS:2386 (Pt-5)-1963 (RA-2007)	1-25%
		Sieve Analysis	IS:2386 (Pt-1)-1963(RA-2007)	Upto 100%
		Deleterious Materials	IS:2386 (Pt-1&2)-1963 (RA-2007)	Upto 10%
		Bulking of sand	IS:2386 (Pt-3)-1963(RA-2007)	4-12%
		Surface Moisture	IS:2386 (Pt-3)-1963(RA-2007)	0.1-1.0%
		Organic impurities	IS:2386 (Pt-2)-1963 (RA-2007)	Visual
<b>9.</b>	<b>Synthetic Resin Adhesive</b>	Cyclic Test	IS : 8948-2006 IS : 1734(Pt-5)-1983(RA-2003)	Visual
		Acidity & Alkalinity (pH)	IS:848-2006	2 - 10 pH
<b>III.</b>	<b>SANITARY FITTING</b>			
<b>1.</b>	<b>Sanitary Fitting Valves</b>	Thread Gauging	IS : 554: 1999 (RA-2004)	15-150 mm
		Linear Measurements (Dimensions)	IS: 1879-2010 IS: 1538-1993 (RA-2004)	0.05- 25 mm 0.10 - 50 mm

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	<b>Sanitary Fitting Valves</b>		IS: 1729-2002	0.50- 150 mm
			IS: 7181-1986 (RA-2005)	0.50 - 200 mm
			IS: 5531-1988 (RA-2002)	1.00 - 300 mm
			IS: 7887-1992 (RA-2007)	5.00- 600 mm
			IS: 9523-2000 (RA-2005)	10- 1000 mm
			IS: 778-1984 (RA-2005)	10- 1000 mm
			IS: 781-1981 (RA-2005)	500 -3000 mm
			IS: 13095-1991 (RA-2005)	
			IS: 14846-2000 (RA-2005)	
			IS: 9890- 1981(RA-2007)	
			IS: 5312(Pt-1)- 2004	
		IS: 2692-1989(RA-2003)		
2.	<b>Sanitary Fittings</b>	Hydrostatic Test	IS: 1879-2010 IS: 1538-1993(RA-2004) IS: 1729-2002 IS: 7181-1986(RA-2005) IS: 5531-1988(RA-2002) IS: 7887-1992(RA-2007) IS: 9523-2000(RA-2005) IS: 778-1984(RA-2005)	0.0098-13.729 MPa
		Hydrostatic Test	IS: 781-1981(RA-2005) IS: 13095-1991 (RA-2005) IS: 14846-2000 (RA-2005) IS: 9890- 1981 (RA-2007) IS: 5312 (Pt-1) - 2004 IS: 2692-1989 (RA-2003)	0.0098-13.729 MPa
		Compression Test	IS : 1879-2010	0.02 -200 mm

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