

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 1 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

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.	Plain Carbon Steel	Carbon	IS 228 (Part 1): 1987 (RA 2012)	0.05% to 2.5%
		Manganese	IS 228(Part. 2): 1987 (RA 2012)	0.1% to 1.50%
		Silicon	IS 228 (Part. 8): 1989 (RA 2014)	0.05% to 5.0%
		Sulphur	IS 228 (Part 9): 1989 (RA 2014)	0.01% to 0.25%
		Phosphorous	IS 228(Part 3): 1987 (RA 2012)	0.01 % to 0.30%
2.	Aluminium & Aluminium Alloys	Silicon	IS 504 (Part 1/Sec 7): 2002 (RA 2012)	0.3% to 16.00%
		Copper	IS 504 (Part 3/Sec 6): 2002 (RA 2012)	0.1% to 5.00%
		Manganese	IS 504 (Part 5): 2002 (RA 2012)	0.01% to 1.50%
		Iron	IS 504 (Part 2/Sec 6): 2002 (RA 2012)	0.1% to 6.00%
3.	Metallic Coatings: Zinc Coated Steel	Mass	IS 6745:1972 (RA 2011) (Stripping Method)	0.001 gm to 200 gm (Weighing Balance)
		Coating	IS 2633:1986 (RA 2011)	Qualitative (Visual)
		Adhesion	IS 2629:1985 (RA 2011) Clause 6.4.1 & 6.4.2	Qualitative (Visual)

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 2 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
By Emission Spectrometer				
4.	Plain Carbon Steel & Alloys Steel	Carbon	IS 8811:1998 (RA 2012)	0.008% to 1.5%
		Manganese		0.01% to 2.0%
		Silicon		0.008% to 1.50%
		Sulphur		0.008% to 0.10%
		Phosphorous		0.008% to 0.150%
		Chromium		0.01% to 5.3%
		Nickel		0.01% to 5.5%
		Molybdenum		0.008% to 1.0%
		Copper		0.008% to 1.0%
		Vanadium		0.005% to 1.0%
		Aluminium		0.008% to 1.5%
5.	Aluminium & Aluminium Alloys	Silicon	IS 11035:1984 (RA 2014)	0.01% to 15.00%
		Copper		0.01% to 15%
		Manganese		0.01% to 1.50%
		Iron		0.01% to 1.50%
		Magnesium		0.01% to 1.3%
		Zinc		0.01% to 8.00%
		Nickel		0.01% to 1.5%
		Titanium		0.01% to 0.6%
		Tin		0.02% to 0.05%
Chromium	0.01% to 0.5%			

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 3 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

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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ELECTRICAL TESTING

I. SWITCHGEAR & PROTECTIVE EQUIPMENT				
1.	Alternating current disconnectors (isolators) & earthing switches for voltages above 1kV (upto 33 kV)	Lightning Impulse	IS 9921(Part 1):1981 RA 2012, IS 9921 (Part 2):1982 RA 2012, IS 9921 (Part 3): 1982 RA 2012, IS 9921 (Part 4):1985 RA 2012, IS 9921 (Part 5):1985 RA 2012. IS 2071-1-2016 (IEC-60060-1-2010)	30 kV _p to 370 kV _p
		Power Frequency voltage withstand (dry & wet)	IS 9921(Part 1):1981 RA 2012, IS 9921 (Part 2):1982 RA 2012, IS 9921 (Part 3): 1982 RA 2012, IS 9921 (Part 4):1985 RA 2012, IS 9921 (Part 5):1985 RA 2012. IS 2071-1-2016 (IEC-60060-1-2010)	0.5 kVrms to 300 kVrms

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 4 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Temperature Rise Current Temperature	IS 9921(Part 1):1981 RA 2012, IS 9921 (Part 2):1982 RA 2012, IS 9921 (Part 3): 1982 RA 2012 IS 9921 (Part 4):1985 RA 2012, IS 9921 (Part 5):1985 RA 2012. IS 2071-1-2016 (IEC-60060-1-2010)	1 A to 3200 AAC Ambient to 180°C
		Resistance of the main circuit by mV drop	IS 9921 (Part 1):1981 RA 2012, IS 9921 (Part 2):1982 RA2012, IS 9921 (Part 3):1982 RA 2012, IS 9921 (Part 4):1985 RA 2012, IS 9921 (Part 5):1985 RA 2012.	2A to 250 A DC, 0.01mV to 500 mV
		Mechanical Endurance	IS 9921 (Part 4): 1985 RA 2012,	Qualitative

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 5 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
2.	Alternating current Switches for voltages above 1 kV (Upto 33 kV)	Lightning Impulse	IS 9920 (Part 1): 2002 RA 2012, IS 9920 (Part 2): 1988 RA 2011, IS 9920 (Part 3): 1982 RA 2012, IS 9920 (Part 4): 1985 RA 2012, IS 2071-1-2016 (IEC-60060-1-2010) IS/IEC 62271-102 : 2003, IS/IEC 62271-105 : 2002	30 kV _p to 370 kV _p
		Power Frequency voltage withstand (dry & wet)	IS 9920 (Part 1): 2002 RA 2012, IS 9920 (Part 2): 1988 RA 2011, IS 9920 (Part 3): 1982 RA 2012, IS 9920 (Part 4): 1985 RA 2012, IS 2071-1-2016 (IEC-60060-1-2010) IS/IEC 62271-102 : 2003, IS/IEC 62271-105 : 2002	0.5 kVrms to 300 kVrms

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 6 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Temperature Rise Current Temperature	IS 9920 (Part 1): 2002 RA 2012, IS 9920 (Part 2): 1988 RA 2011, IS 9920 (Part 3): 1982 RA 2012, IS 9920 (Part 4): 1985 RA 2012, IS/IEC 62271-102 : 2003 IS/IEC 62271-105 : 2002	1 A to 3200 AAC Ambient to 180°C
		Resistance of the main circuit by mV drop	IS 9920 (Part 1): 2002 RA 2012, IS 9920 (Part 2): 1988 RA 2011, IS 9920 (Part 3): 1982 RA 2012, IS 9920 (Part 4): 1985 RA 2012, (IEC-60060-1-2010). IS/IEC 62271-102 : 2003, IS/IEC 62271-105 : 2002	2 A to 250 A DC, 0.01 mV to 500 mV
		Mechanical Endurance	IS 9920 (Part 4): 1985 RA 2012	Qualitative
3.	Alternating current disconnectors (isolators) & earthing switches for voltages above 33 kV (Upto 420 kV)	Temperature Rise Current Temperature	IS 9921(Part 1):1981 RA 2012, IS 9921 (Part 2):1982 RA 2012, IS 9921 (Part 3): 1982 RA 2012, IS 9921 (Part 4):1985 RA 2012, IS 9921 (Part 5):1985 RA 2012.	1 A to 3200 AAC Ambient to 180°C

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 7 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Resistance of the main circuit by mV drop	IS 9921(Part 1):1981 RA 2012, IS 9921 (Part 2):1982 RA 2012, IS 9921 (Part 3): 1982 RA 2012, IS 9921 (Part 4):1985 RA 2012, IS 9921 (Part 5):1985 RA 2012.	Current : 2 A to 250 A DC 0.01 mV to 500 mV
4.	High Voltage Fuses-Explosion (Drop out & Cut out HV Fuse) (upto 33 kV)	Lightning Impulse	IS 9385 (Part 1): 1979 RA 2012, IS 9385 (Part 2) :1980 RA 2012, IS 9385 (Part 3): 1980 RA 2012, IS 2071-1-2016 (IEC-60060-1-2010)	30 kV _P to 370 kV _P
		Power Frequency voltage withstand (dry & wet)	IS 9385 (Part 1): 1979 RA 2012, IS 9385 (Part 2) :1980 RA 2012, IS 9385 (Part 3): 1980 RA 2012, IS 2071-1-2016 (IEC-60060-1-2010)	0.5 kVrms to 300 kVrms

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 8 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Temperature Rise Current Temperature	IS 9385 (Part 1): 1979 RA 2012, IS 9385 (Part 2) :1980 RA 2012, IS 9385 (Part 3): 1980 RA 2012, IS 2071-1-2016 (IEC-60060-1-2010)	1 A to 3200 A AC Ambient to 180°C
II.	TRANSMISSION LINE EQUIPMENT & ACCESSORIES			
1.	Electric Power Connector	DC Resistance Temperature Rise Current Temperature	IS 5561-1970, RA 2012 IS 5561-1970, RA 2012 ANSI/NEMA CC 1-2009	3 mΩ to 200 mΩ 1 A to 3200 A AC Ambient to 200°C
2.	EC Grade Al. Rod	Resistance / Conductivity/ Resistivity	IS 5484-1997, RA 2011	3 mΩ to 200 mΩ
3.	Al. Alloy Redraw Wire	Resistance / Conductivity/ Resistivity	IS 9997-1991, RA 2011	3 mΩ to 200 mΩ
	Wrought Al. wire	Resistance / Conductivity/ Resistivity	IS 2067-1975, RA 2012 IS 3635-1966, RA 2010	3 mΩ to 200 mΩ
	Copper rod / bar		IS 613 (2000) RA 2011 IS 191-2007.	3 mΩ to 200 mΩ
	Copper strip		IS 1897-2008, RA 2013 IS 3635-1966, RA 2010	3 mΩ to 200 mΩ
	Low Carbon GS wire/ formed wire		IS 3975-1999, RA 2009 IS 10810-42-1984, RA 2011, IS 12048: 1987, RA 2012	3 mΩ to 200 mΩ
4.	Metal Fitting / accessories for Insulators /	Electrical Resistance / resistivity / conductivity	IS 12048 : 1987 RA 2012, IS 2121 (Part-1) :1981 RA 2012,	3 mΩ to 200 mΩ

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 9 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Conductors / Earth Wires for O.H. Lines	Heating Cycle	IS 2121 (Part-2) 1981 RA 2012, IS 2121 (Part-3) 1992 RA 2012, IS 2121 (Part-4) 1991 RA 2012, IS 2486 (Part-1) 1993 RA 2013, IEC 61284 (class A joints only), BS 3288 Pt-1: 1997	1 A to 2000 A Ambient to 200°C
5.	Insulated cables accessories	Electrical Ageing test	NF C 33 004 : 1998	1 A to 800 A AC, Ambient to 200°C
		Current	NF C 33 020 : 1998	
		Temperature	EN 50483-5 : 2011	3 mΩ to 200 mΩ
		Resistance		
		Voltage test	NF C 33 020 : 1998 NF C 33 041 : 1998	0.5 kVrms to 25 kVrms
6.	Indoor Post Insulator of Organic Materials above 1 kV	Water tightness test	NF C 33 020 : 1998	Qualitative
		Electrical continuity	NF C 33 020 : 1998	5 Nm to 30 Nm
		Mechanical test	NF C 33 020 : 1998 NF C 33 041 : 1998	1 kN to 500 kN
7.	Composite Insulator, (solid)	Lightning Impulse voltage withstand & flashover	IS 9431-1979: RA 2014 IS 2071 (Part-1) 1993/ IEC : 60-1 (1989)	30 kV _P to 370 kV _P
		Lightning Impulse Puncture	IS 9431-1979: RA 2014 IS 2071 (Part-1) 1993/ IEC : 60-1 (1989)	30 kV _P to 370 kV _P
		Dry Power Frequency voltage withstand & flashover	IS 9431-1979: RA 2014 IS 2071 (Part-1) 1993/ IEC : 60-1 (1989)	0.5 kVrms to 300 kVrms
		Mechanical strength	IS 9431-1979: RA 2014.	1 kN to 500 kN
		Dry Lightning Impulse Withstand Voltage	IEC 61109 : 2008 IEC 60383-1:1993	30 kV _P to 370 kV _P

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 10 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	core with polymeric housing	Wet Power Frequency	IEC 61109 : 2008 IEC 60383-1:1993	0.5 kVrms to 300 kVrms
		Dry Power Frequency Voltage	IEC 62217:2005	0.5 kVrms to 300 kVrms
		Mechanical Load (sample test & routine test only)	IEC 61109 : 2008 IEC 60383-1:1993	1 kN to 500 kN
		Assembled core load time test	IEC 61109 : 2008	1 kN to 500 kN
		Damage limit proof test & test of tightness of interface between end fittings and insulator housing	IEC 61109 : 2008	1 kN to 500 kN
		Galvanizing	IEC 61109 : 2008 IEC 60383-1:1993	Qualitative (visual)
		Porosity / Dye penetration test	IEC 61109 : 2008 IEC 62217:2005	Qualitative (visual)
		Brittle fracture resistance	As per customer	1 kN to 500 kN
8.	Ceramic / Glass Insulator /string (above 33 kV grade, upto 72.5 kV)	Dry Lightning Impulse Voltage Withstand (w/o Flashover)	IS 731-1971 RA 2011 IS 2544-1973 RA 2011, IEC-60383-2:1993 IEC-60383-1:1993,	30 kV _P to 370 kV _P
		Wet Power Frequency Voltage Withstand	IS 731-1971 RA 2011 IS 2544-1973 RA 2011, IEC-60383-1:1993, IEC-60383-2:1993,	0.5 kVrms to 300 kVrms
		Dry Power Frequency Voltage Withstand	IS 2544-1973 RA 2011.	0.5 kVrms to 300 kVrms
		Mechanical Load	IEC-60383-1:1993, IEC-60383-2:1993,	1 kN to 500 kN

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 11 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
9.	Ceramic / Glass Insulator (145 kV grade)	Wet Power Frequency Voltage Withstand	IS 731-1971 RA 2011 IS 2544-1973 RA 2011, IEC-60383-1:1993, 60383-2:1993,	0.5 kVrms to 300 kVrms
		Dry Power Frequency Voltage Withstand	IS 2544-1973 RA 2011.	0.5 kVrms to 300 kVrms
10.	Low-voltage Switchgear and control gear Assemblies (TTA & PTTA /Bus bar trunking system)	Temperature Rise	IS-8623 Part 1 (1993)/ IEC 60439-1 (1985)	1A to 3200 A AC Ambient to 200°C
		Current Temperature	RA 2013, IS-8623 Part 2 (1993)/ IEC 60439-2 (1987) RA 2013.	
		Di-electric test	IS-8623 Part 1 (1993)/ IEC 60439-1 (1985) RA 2013, IS-8623 Part 2 (1993)/ IEC 60439-2 (1987) RA 2013.	0.5 kVrms to 5 kVrms
11.	AC Metal enclosed Switchgear Control gear	Temperature Rise	IS-3427 (1997)/ IEC 60298 (1990)	1A to 3200 A AC Ambient to 200°C
		Current Temperature		
		Impulse voltage	IS-3427 (1997)/ IEC 60298 (1990)	30 kV _P to 370 kV _P
		Power Frequency Voltage Withstand	IS-3427 (1997)/ IEC 60298 (1990)	0.5 kVrms to 300 kVrms
12.	Interconnecting Bus-Bars for AC Voltage Up to 36 kV	Impulse voltage	IS 8084-1976, RA 2012.	30 kV _P to 370 kV _P
		Power Frequency Voltage Withstand	IS 8084-1976, RA 2012.	0.5 kVrms to 300 kVrms
		Temperature Rise Current Temperature	IS 8084-1976, RA 2012.	1A to 3200 A AC Ambient to 200°C
		Insulation Resistance	IS 8084-1976, RA 2012.	0-2000/inf.

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 12 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
13.	Ceramic / Glass Insulator /string (upto 33 kV grade)	Lightning Impulse voltage withstand & flashover (Dry)	IS 731(1971) RA2016, IS 2544 (1973) RA2016, IEC-60383-1:1993, IEC 60383-2:1993, IS 2071-1-2016 (IEC-60060-1-2010). ANSI C29.1(1988), ANSI C29.2(1992) ANSI C29.6(1996), ANSI C29.7(1996) IS 4318 : 1993: RA 2013, IS 2099 : 1986: RA 2013, IEC-60137:2008, IEC-60168: 2001.	30 kV _p to 370 kV _p
		Dry Power Frequency voltage withstand & flashover	IS 1445 (1977) RA 2014 IS 2544 (1973) RA 2016, IS 5300 1969: RA 2014, IS 5621-1970: RA 2014, ANSI C29.1(1988), ANSI C29.2(1992), ANSI C29.3(1986), ANSI C29.4(1989), ANSI C29.6(1996), ANSI C29.7(1996), IEC-60383-1-1993, IS 2071-1-2016 (IEC-60060-1-2010). IS 2099 : 1986 RA2013, IS 7421: 1988 RA2014, IEC-60137:2008, IEC-60168: 2001.	0.5 kV _{rms} to 300 kV _{rms}

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 13 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Wet Power Frequency voltage withstand & flashover	IS 1445 (1977) RA2014, IS 2544(1973) RA2016, IS 5300 1969: RA2014, IEC-60383-1:1993, IEC 60383-2:1993, IS 2071-1-2016 (IEC-60060-1-2010), ANSI C29.1(1988), ANSI C29.2(1992), ANSI C29.3(1986), ANSI C29.6(1996), ANSI C29.7(1996), IS 731(1971): RA2016, IS 4318 : 1993: RA2013, IS 2099 : 1986: RA2013, IS 7421: 1988: RA2014, IEC-60137: 2008, IEC-60168: 2001	0.5 kVrms to 300 kVrms
		Temperature Cycle	IS 1445 (1977) RA 2014, IS 2544(1973) RA 2016, IS 5300 1969: RA 2014, IS 731(1971): RA 2016, IS 5621-1970: RA 2014, IEC-60383-1-1993, IS 4318 : 1993: RA 2013, IS 7421: 1988: RA 2014, IEC-60168: 2001	Ambient to 100°C

Neeraj Verma
Convenor

N. Venkateswaran
Program Director

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 14 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Under oil puncture withstand	IS 1445 (1977) RA 2014, IS 2544(1973) RA 2016, IS 731(1971): RA 2016, IEC-60383-1-1993, ANSI C29.1(1988), ANSI C 29.2(1992), ANSI C29.6(1996), ANSI C29.7 (1996). IEC-60168: 2001	7.5 kVrms to 250 kVrms
		Electromechanical failing	IS 731(1971): RA2016, IEC-60383-1-1993, ANSI C29.1(1988), ANSI C29.2 (1992).	1 kN to 500 kN 12 kVrms to 100 kVrms
		Porosity	IS 1445 (1977) RA 2014, IS 2544(1973) RA 2016, IS 5300 1969: RA 2014,, IS 731(1971): RA 2016, IS 5621-1970: RA 2014, IEC-60383-1-1993, ANSI C29.1(1988), ANSI C 29.2(1992), ANSI C29.3(1986), ANSI C29.4(1989), ANSI C29.6(1996), ANSI C29.7 (1996). IS 4318 : 1993: RA 2013, IS 7421: 1988: RA2014, IEC-60168: 2001.	10 kg/cm ² to 750 kg/cm ²
		Visible discharge	IS 2544(1973) RA2016, IS 731(1971): RA2016.	0.5 kVrms to 50 kVrms
		Mechanical failing Load	IS 731-1971: RA2016, IEC-60383-1-1993. IS 4318 : 1993: RA 2013, IEC-60168: 2001.	1 kN to 500 kN

Laboratory **Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal**

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

Certificate Number **TC-5137**

Page 15 of 22

Validity **20.11.2017 to 19.11.2019**

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Mechanical test (24 Hrs.)	IS 731(1971) (before amendment 7)	1 kN to 300 kN
		Mechanical Strength	IS 2544(1973) RA 2016.	1 kN to 500 kN
		Mechanical Performance test (successive cycles of loading/ un-loading followed by mechanical/ electromechanical failing)	IS 731(1971): RA2016. IEC 60575-1977, ANSI C29.1 (1988), ANSI C29.2 (1992). IS 4318 : 1993: RA 2013	1 kN to 1000 kN
		Galvanizing (uniformity of zinc coating)	IS 2544(1973) RA2016, IS 731(1971): RA2016. ANSI C29.1 (1988), ANSI C29.2(1992), IS 4318: 1993: RA 2013. IS 2633: 1986: RA2016.	Qualitative (visual)
		Residual Strength test (after mechanical damage of the dielectric)	IEC 60797 : 1984 ANSI C29.2 (1992)	1 kN to 500 kN,
		Verification of axial and radial displacement	IEC-60383-1-1993	Upto 50 mm

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 16 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
14.	a. ACSR/ ACASR/ AAAC	Electrical Resistance / Resistivity	IS 398 (Part 1): 1996 (RA 2012) IS 398 (Part 2): 1996 (RA 2012) IS 398 (Part 3): 1976 (RA 2009) IS 398 (Part 4): 1994 (RA 2009) IS 398 (Part 5): 1992 (RA 2012) IEC 61089:1993 BS 215 (Part 1 & Part 2) (1970)	3 mΩ to 200 mΩ
	b. Earth Wires		IS 12776-2002 RA 2012	
15.	Circuit Breaker (AC Metal enclosed Switch Gear and Control)	Lightning Impulse voltage withstand	IEC : 62271-100 : 2008 (amendment 1: 12) IEC : 62271-1 :2007 (amendment 2011) IEC : 62271-200 (2011)	30 kV _P to 370 kV _P
		Dry Power Frequency voltage withstand	IEC : 62271-100 : 2008 (amendment 1: 12) IEC : 62271-1 :2007 (amendment 2011) IEC : 62271-200 (2011)	0.5 kVrms to 300 kVrms
		Wet Power Frequency voltage withstand	IEC : 62271-100 : 2008 (amendment 1: 12) IEC : 62271-1 :2007 (amendment 2011) IEC : 62271-200 (2011)	0.5 kVrms to 300 kVrms
		Measurement of contact resistance	IEC : 62271-100 : 2008 (amendment 1: 12) IEC : 62271-1 :2007 (amendment 2011) IEC : 62271-200 (2011)	3 mΩ to 200 mΩ

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 17 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Temperature rise	IEC : 62271-100 : 2008 (amendment 1: 12)	
		Current	IEC : 62271-1 :2007 (amendment 2011)	1 A to 3200 AAC
		Temperature	IEC : 62271-200 (2011)	Ambient to 200°C
16.	Current Transformer (Upto 33 kV grade)	Lightning Impulse voltage withstand	IS 2705 (Part 1): 1992 RA 2012, IS 2071-1-2016 (IEC-60060-1-2010). IEC-61869-1 (2007) / IS 16227 : (Part 1): 2016 IEC-61869-2 (2012) / IS 16227 : (Part 2): 2016	30 kV _p to 370 kV _p
		Wet Power Frequency voltage withstand	IS 2705 (Part 1): 1992 RA 2012, IS 2071-1-2016 (IEC-60060-1-2010). IEC-61869-1 (2007) / IS 16227 : (Part 1): 2016 IEC-61869-2 (2012) / IS 16227 : (Part 2): 2016	0.5 kVrms to 300 kVrms
		Dry Power Frequency voltage withstand	IS 2705 (Part 1): 1992 RA 2012, IS 2071-1-2016 (IEC-60060-1-2010). IEC-61869-1 (2007) / IS 16227 : (Part 1): 2016 IEC-61869-2 (2012) / IS 16227 : (Part 2): 2016	0.5 kVrms to 300 kVrms
		Temperature Rise	IS 2705 (Part 1): 1992 RA 2012,	
		Current	IS 2071-1-2016 (IEC-60060-1-2010).	1 A to 3200 AAC

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 18 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Temperature	IEC-61869-1 (2007) / IS 16227 : (Part 1): 2016 IEC-61869-2 (2012) / IS 16227 : (Part 2): 2016	Ambient to 180°C
17.	Potential Transformer (upto 33 kV grade)	Lightning Impulse voltage withstand	IS 3156 (Part 1): 1992 RA 2012, IS 2071(Part-1): 993/ IEC:60-1 (1989) IEC-61869-1 (2007) / IS-16227 (Part1) 2016: IEC-61869-3 (2011) / IS-16227 (Part 3): 2015.	30 kV _P to 370 kV _P
		Wet Power Frequency voltage withstand	IS 3156 (Part 1): 1992 RA 2012, IS 2071-1-2016 (IEC-60060-1-2010). IEC-61869-1 (2007), IEC-61869-3 (2011)	0.5 kVrms to 300 kVrms
		Dry Power Frequency voltage withstand	IS 3156 (Part 1): 1992 RA 2012, IS 2071-1-2016 (IEC-60060-1-2010). IEC-61869-1 (2007), IEC-61869-3 (2011)	0.5 kVrms to 300 kVrms
		Temperature Rise	IS 3156 (Part 1): 1992 RA 2012, IEC-61869-1 (2007), IEC-61869-3 (2011)	12 kVrms to 80 kVrms Upto 100°C

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 19 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

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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MECHANICAL TESTING

I. MECHANICAL PROPERTIES OF METALS				
1.	AA Conductors	Freedom from Defects	IS 398 (Part 1): 1996 (RA 2012)	Qualitative
		Diameter of Individual Wire (Al.)		1.0 mm to 10 mm
		Breaking Load of All Individual Al Wires		0.5 kN to 10 kN
		Lay Ratio		10 mm to 300 mm
2.	ACSR Conductors	Freedom from Defects	IS 398 (Part 2): 1996 (RA 2012) & IS 398 (Part 5): 1992 (RA 2012)	Qualitative
		Diameter of Individual Wire (Al. & Steel)		1.0 mm to 10 mm
		Breaking Load of All Individual Al./Steel Wire		0.5 kN to 20 kN
		Ductility (Elongation/Torsion)		2 % to 10 %/ 1.5 mm to 5 mm
		Wrapping (Al. & Steel)		1.5 mm to 5.0mm
		Measurement of Lay Ratio		10 mm to 300 mm
		Surface condition		2 mm to 50 mm
		Ultimate Breaking Load		2.5 kN to 250 kN
		Stress-Strain on Conductor		IS 398 (Part-2) 1996 (RA 2012)
Stress-Strain on Steel core		Qualitative		
3.	AAA Conductors	Freedom from Defects	IS 398 (Part 4): 1994 (RA 2014)	Qualitative
		Diameter of Individual Wire (Al.)		0.5 mm to 10 mm
		Breaking Load of All Individual Al Wires		0.5 kN to 10 kN

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 20 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Lay Ratio		10 mm to 300 mm
		Elongation		1 % to 10 %
4.	Galvanized Barbed Wire	Freedom from Defects	IS 278: 2009	Qualitative
		Dimension Verification		1.5 mm to 100 mm
		Mass of Wire		50 g to 200 g
		Ductility (Wrapping)		Qualitative 1.5 mm to 5.0 mm
5.	Galvanized Stay Strand	Freedom from Defects	IS 2141: 2000 (RA 2010)	Qualitative
		Diameter of Individual Wire	IS 1755: 1983 (RA 2011)	0.5 mm to 10 mm
		Lay Ratio	IS 6594: 2001 (RA 2012)	10 mm to 300 mm
		Ductility (Torsion/Wrapping)		1.5 mm to 5.0 mm
6.	Earth Wire	Diameter of Individual Wire	IS 12776: 2002 (RA 2012)	1.0 mm to 10 mm
		Breaking Force		2.5 kN to 250 kN
7.	Metal Fittings of Insulators	Visual Examination	IS 2486 (Part 1): 1993 (RA 2013)	Qualitative
		Slip strength		Qualitative
		Mechanical Strength		5 kN to 1000 kN
		Deflection		2 kN to 25 kN
		Verification of Dimension	IS 2486 (Part 2): 1989 (RA 2014)	0.5 mm to 300 mm
8.	Conductor and Earth Wire Accessories	Visual Examination	IS 2121(Part 1): 1981 (RA 2012)	Qualitative
		Verification of Dimension	IS 2121(Part 2): 1981 (RA 2012) & IS 2121(Part 3): 1992 (RA 2012)	0.5 mm to 300 mm
		Tensile Strength	IS 2121 (Part 1): 1981 (RA 2012)	50 N/mm ² to 1000 N/mm ²
		Wrapping		Qualitative 1.5 mm to 5.0 mm
		Bend		3 mm to 60 mm

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 21 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Resilient		5 kN to 250 kN
		Clamp Slip Strength	IS 2121 (Part 1): 1981 (RA 2012) IS 2121 (Part 3): 1992 (RA 2012)	Qualitative
		Failing load	IS 2121(Part 2): 1981 (RA 2012)	5 kN to 250 kN
		Mechanical Strength	IS 2121(Part 3): 1992 (RA 2012)	2 kN to 250 kN
9.	Ferrous , Alloy Product & Material (Cast Iron , Structural Steel , Steel Tube & Al & Al alloy Sheet & Strip , Deformed Steel Bars & Wires, Mild Steel Wire , Wrought Al, Al Alloy Wire, EC Grade Al Rod, Earth Wire, Power Connectors , Barbed Wire, Galvanized Stay Strand)	Yield Strength	IS 1608: 2005 (RA 2011)	50 N/mm ² to 1500 N/mm ²
		Ultimate Tensile Strength	IS 1599-2012 (RA:2015)	50 N/mm ² to 1200 N/mm ²
		Elongation %		5 % to 40 %
		Mass/ Meter		0.01 kg to 5 kg
		Bend		Qualitative Mandrel Diameter: (16mm, 20 mm, 24 mm, 28 mm, 32 mm)
10.	Ferrous , Non-Ferrous Product & Material (Mild	Freedom from Defects	IS 280: 2006 (RA 2015)	Qualitative
		Dimension Verification	IS 1608: 2005 (RA 2011)	0.5 mm to 25 mm
		Torsion	IS 1755: 1983 (RA 2011)	2 kN to 500 kN

Laboratory Testing Laboratory, NSIC-Technical Services Centre (A Govt. of India Enterprise), Japanigate, P.O. Balitikuri, Distt. Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5137

Page 22 of 22

Validity 20.11.2017 to 19.11.2019

Last Amended on 29.11.2017

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Steel Wire, Wrought Al, Al Alloy Wire, EC Grade Al Rod, Earth Wire, Power Connectors)	Wrapping	IS 5561:1970 (RA 2012) IS 5584:1997 (RA 2011) IS 739:1992 (RA 2011)	Qualitative 1.5 mm to 5.0 mm
11.	Point Hook with Shank	Proof Load	IS 15560: 2005 (RA 2015)	20 kN to 1000 kN
12.	Steel Wire Ropes	Breaking Force	IS 2266: 2002 (RA 2012)	20 kN to 1000 kN
13.	Sluice Valve, Butterfly Valve, Swing Check type Non-Return Valve	Verification of Dimension	IS 14846: 2000 (RA 2010) IS 13095: 1991 (RA 2013)	5 mm to 2500 mm
		Hydraulic	IS 5312 (Part 1): 2004 (RA 2014)	1 kg/cm ² to 30 kg/cm ²
14.	Couplers	Distortion	IS 2750: 1964 (RA 2010)	5 kN to 100 kN
		Slip	BS EN74-1: 2005	
15.	Chain Pulley Block	Proof Load	IS 3832: 2005 (RA 2015)	5 kN to 250 kN