



MAHAVIR TRANSMISSION LIMITED

An ISO 9001-15, 14001-15, 27001 : 13, 31000:18 & 45001-18, 50001:18 Certified Company
Corporate Office: C-58, Sector-4, Noida-201301 (U.P.) Ph.: 0120-4127944



MTL/24-25/BIS/398/01

Date : 18.10.2024

To,
BUREAU OF INDIAN STANDARDS

Sub : Comments and suggestions in draft Indian Standard 398 Part-2

Dear Sir,

We are pleased to submit our comments and suggestions towards the Draft IS 398 (Part 2) : 2024 clause by clause as follows :

Cl No	Name Of Clause	Our Comments / Suggestions/ Query
1.	Scope	Acceptable With No Comments
2.	References	Acceptable With No Comments
3.	Terminology	Acceptable With No Comments
4.	Physical Constants For Hard Drawn Aluminium	Acceptable With No Comments
5.	Physical Constants For Galvanized Steel Wires	Acceptable With No Comments
6.	Material	Acceptable With No Comments
7.	Freedom From Defects	Acceptable With No Comments
8.	Standard Sizes	Acceptable With No Comments
8.1.2.1	Aluminum Wires <u>Change requested</u> <u>A tolerance of $\pm 1\%$ shall be permitted on the nominal diameters of all size on the nominal diameters as specified in Table 1 (rounded off).</u> <u>Reason for Change</u> <u>Drawing of Aluminium wires at high speeds of upto 1500 MPM and thereafter laying on stranding machines at speeds of 20-70 MPM with various mechanical and materialistic hurdles such as clutches, brakes, tensions equipment etc. can be very challenging with even good quality Indigenous machine suppliers. It will not be possible to run machines at optimal speeds if the tolerance in Diameter is reduced to 1%, thus resulting in loss of production capacity. Further, diameter measuring procedure being manual only - several times raise disputes with inspecting personals and many times results in material holding or even unnecessary rejection.</u> <u>As a result of above change the overall production capacity of each manufacturer shall be reduced by an estimate of 30%. In today's time due to huge requirement of Conductors in view of various Transmission Line and Distribution Line projects undertaken by the Govt. Of India; the above change will result in unnecessary delay in completion of projects.</u>	
8.1.2.2	Galvanized Steel Wire	Acceptable With No Comments
8.2	Aluminum Conductors, Galvanized Steel-Reinforced	Acceptable With No Comments
9.	Joint In Wires	Acceptable With No Comments





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Diameter			Cross sectional Area Of Nominal Diameter Wire	Mass	Dc Resistance At 20°C Max	Minimum Breaking Load	
Nom	Min	Max				Before Stranding	After Stranding
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mm	Mm	Mm	Mm ²	Kg/Km	Ω/Km	Kn	Kn
1.50	1.48	1.52	1.767	4.78	16.429	0.34	0.32
1.96	1.94	1.98	3.017	8.15	9.562	0.56	0.53
2.11	2.09	2.13	3.497	9.45	8.239	0.63	0.60
2.54	2.51	2.57	5.067	13.70	5.711	0.86	0.82
2.59	2.56	2.62	5.269	14.24	5.490	0.90	0.86
2.79	2.76	2.82	6.114	16.53	4.724	1.04	0.99
3.00	2.97	3.03	7.069	19.11	4.079	1.20	1.14
3.18	3.15	3.21	7.942	21.47	3.626	1.31	1.24
3.35	3.32	3.38	8.814	23.82	3.265	1.45	1.38
3.50	3.46	3.54	9.621	26.01	3.006	1.59	1.51
3.53	3.49	3.57	9.787	26.45	2.954	1.57	1.49
3.80	3.76	3.84	11.341	30.65	2.545	1.81	1.72
3.99	3.95	4.03	12.504	33.80	2.306	2.00	1.90
4.09	4.05	4.13	13.138	35.51	2.194	2.10	2.00
4.13	4.09	4.17	13.396	36.21	2.151	2.14	2.03
4.44	4.40	4.48	15.483	41.85	1.859	2.48	2.36
4.57	4.52	4.62	16.403	44.34	1.761	2.62	2.49
4.72	4.67	4.77	17.497	47.29	1.650	2.80	2.66
4.78	4.73	4.83	17.945	48.51	1.608	2.87	2.73

Table 1

Aluminium Wires Used In The Construction Of Aluminium Conductors, Galvanized Steel-Reinforced For Overhead Transmission Lines

Change requested

Revise the table as following

Reason

Due to change requested in Tolerance of diameter by us in CL No. 8.1.2.1, values of the table will be changed accordingly and same has been calculated in below table

Table 2

Steel Wires Used In The Construction Of Aluminium Conductors, Galvanized Steel-Reinforced For Overhead Transmission Lines

Acceptable With No Comments



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Table 3

Aluminium Conductors, Galvanized Steel-Reinforced For Overhead Transmission Lines

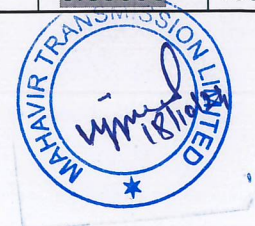
Change requested

Revise the table as following

Reason

Due to change requested in Tolerance of diameter by us in CL no 8.1.2.1, and in Lay Ratio values of the table will be changed accordingly and same has been calculated in below table

Nominal Aluminium	Stranding And Wire Diameter		Sectional Area Of Alum Inum	Total Sectional Area	Approx Dia meter	Approx. Mass	Calculated DC Resistance At 20°C Max	Approx Calculated Breaking Load Min
	Aluminum	Steel						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
MM ²	MM	MM	MM ²	MM ²	MM	Kg/Km	Ohm/Km	KN
10	6/1.50	1/1.50	10.6	12.4	4.50	43	2.7795	4.09
18	6/1.96	1/1.96	18.1	21.1	5.88	73	1.6176	6.86
20	6/2.11	1/2.11	21.0	24.5	6.33	85	1.393	7.61
30	6/2.59	1/2.59	31.6	36.9	7.77	128	0.9290	11.17
50	6/3.35	1/3.35	52.9	61.7	10.05	214	0.5524	18.37
80	6/4.09	1/4.09	78.8	92.0	12.27	319	0.3711	27.02
100	6/4.72	7/1.57	105.0	118.5	14.15	394	0.2792	32.53
130	26/2.54	7/1.91	131.7	151.8	15.89	521	0.2244	45.65
150	30/2.59	7/2.59	158.1	194.9	18.13	726	0.1871	67.63
180	30/2.79	7/2.79	183.4	226.2	19.53	842	0.1610	78.35
200	30/3.00	7/3.00	212.1	261.5	21.00	974	0.1390	90.56
400	26/4.44	7/3.45	402.6	468.0	28.11	1624	0.07302	136.26
400	42/3.50	7/1.96	404.1	425.2	26.88	1286	0.07335	90.43
420	54/3.18	7/3.18	428.9	484.5	28.62	1627	0.06868	131.44
520	42/3.99	7/2.21	525.2	552.0	30.57	1666	0.05628	112.31
530	54/3.53	7/3.53	528.5	597.0	31.77	2004	0.05616	159.60
560	42/4.13	7/2.30	562.7	591.7	31.68	1787	0.05250	120.57
690	42/4.57	7/2.54	688.9	724.4	35.04	2187	0.04298	147.47
810	45/4.78	7/3.18	807.5	863.1	38.22	2668	0.03653	188.69



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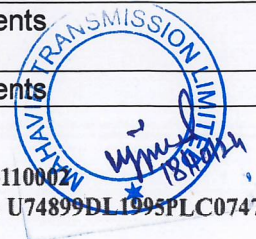
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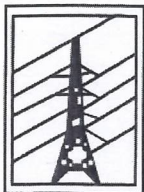


Table 4	Table 4 Lay Ratio Of Aluminium Conductors Galvanized Steel-Reinforced	Change requested Revise the table as following Reason Lay Ratio limits in Draft Standard is very narrow – may please be revised as per below table which is in line with EN50182/IEC 61089 & old IS 398 Part2
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Number Of Wires In Conductor		Lay Ratios For Aluminium Wire							
		Lay Ratios For Steel Core (6 Wire Layer)		Outside Layer		Layer Immediately Beneath Outside Layer.		Innermost Layer Of Conductors With 3 Aluminium Wire Layers	
Aluminium	Steel	Min	Max	Min	Max	Min	Max	Min	Max
(1)	(2)	(3)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
6	1			10	14				
6	7	13	28	10	14				
26	7	13	28	10	14	10	16		
30	7	13	28	10	14	10	16		
42	7	13	28	10	14	10	16	10	16
45	7	13	28	10	14	10	16	10	16
54	7	13	28	10	14	10	16	10	16

Table 5	Stranding Constant For Aluminium Conductors, Galvanized Steel-Reinforced For Overhead Transmission Lines	Acceptable With No Comments
10	Stranding	Acceptable With No Comments
11	Lengths And Tolerances In Lengths	Acceptable With No Comments
12	Packing And Marking	Acceptable With No Comments
13.1	Classification Of Tests	Acceptable With No Comments
13.2	Selections Of Test Samples For Routine Test, Acceptance Test And Type Test	Type Tests already available with conductor manufacturer shall remain valid for 10 years as per CEA guidelines. After expiry, fresh Type Tests may be got done by conductor manufacturers as per new Standard.
13.2.1	Routine Tests	Acceptable With No Comments
13.2.2	Selection Of Test Samples For Acceptance Tests	Acceptable With No Comments
13.2.3	For The Purpose Of Various Test	Acceptable With No Comments
13.2.4	Selection Of Samples For Type Tests	Acceptable With No Comments
13.4	Visual Examination	Acceptable With No Comments
13.5	Measurement Of Lay Ratio /Direction Of Lay	Acceptable With No Comments
13.6	Breaking Load Test	Acceptable With No Comments





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13.7	Ductility Test	Acceptable With No Comments
13.8	Wrapping Test	Acceptable With No Comments
13.9	Dc Resistance Test	Acceptable With No Comments
13.10	Galvanizing Test	Acceptable With No Comments
13.11	Procedure Qualification Test On Welded Aluminium Wires	Acceptable With No Comments
13.12	Dc Resistance Test On Stranded Conductor	Acceptable With No Comments
13.13	Surface Condition Test	Acceptable With No Comments
13.14	Ultimate Tensile Strength Test On Stranded Conductor	Acceptable With No Comments
13.15	Corona Test	Acceptable With No Comments
13.16	Radio Interference Voltage Test	Acceptable With No Comments
14	Rejection And Retests	Acceptable With No Comments
Annex A	Notes On Calculation Of Resistance, Mass And Breaking Load	Acceptable With No Comments
Annex B	Chemical Composition Of High Carbon Steel	Acceptable With No Comments

We hope you will please find our comments and suggestions reasonable and in Line with international standards like EN50182/IEC 61089 etc.

Please feel free to contact us for any clarifications.

Thanks and Regards,


(Authorized Signatory)