AMENDMENT NO. 1 SEPTEMBER 2024

TO

IS 13778 (PART 2) : 2013/IEC 60851-2 : 2009 WINDING WIRES — TEST METHODS

PART 2 DETERMINATION OF DIMENSIONS

(First Revision)

This amendment of IS 13778 (Part 2) : 2013 is identical to merged Amendment No. 1 (2015) and Amendment No. 2 (2019) of IEC 60851-2 : 2009.

Price Group 3

3 Test 4: Dimensions

3.1 Equipment

3.1.1 Round and rectangular wire

Replace Table 1b by the following:

Table 1b – All the types of winding wires except enamelled round wire

Type of winding wire	Nominal conductor diameter mm	Anvil diameter mm	Measuring force N
Enamelled rectangular wire	-	5 to 8	2 to 4
Film tape wrapped round wire	≥ 0,100	5 to 8	2 to 4
Film tape wrapped rectangular wire	-	5 to 8	2 to 4
Fibrous covered wire	-	5 to 8	2 to 4

After Table 1b, add the following new Table 1c and paragraph:

Table 1c – Paper covered wire

Type of winding wire	Nominal conductor diameter mm	Anvil diameter mm	Measuring pressure N/mm^2
Paper covered wire	-	5 to 8	1 to 2

For paper covered rectangular wire, a measuring pressure is considered more appropriate instead of a measuring force. Annex A provides for information a table with the relationship between force and pressure for a typical measuring range.

Add the following new annex:

Annex A
(informative)

Table A.1 provides information, within a typical range, on the relationship between force and pressure applied to the wire according to Table 1c. Values outside the range of this table can be calculated using the following formula:

$p = F/A$

where:

p is the pressure, in N/mm^2;

F is the force, in N;

A is the section of the wire on which the force is applied, in mm^2.

Table A.1 – Relationship between force, pressure, anvil diameter and rectangular wire surface *(1 of 2)*

Force N	**Pressure** (N/mm^2)				
	Anvil diameter mm				
	5	**6**	**6,5**	**7**	**8**
	Surface mm^2				
	19,63	**28,26**	**33,17**	**38,47**	**50,24**
1	0,05	0,04	0,03	0,03	0,02
2	0,10	0,07	0,06	0,05	0,04
3	0,15	0,11	0,09	0,08	0,06
4	0,20	0,14	0,12	0,10	0,08
5	0,25	0,18	0,15	0,13	0,10
6	0,31	0,21	0,18	0,16	0,12
7	0,36	0,25	0,21	0,18	0,14
8	0,41	0,28	0,24	0,21	0,16
9	0,46	0,32	0,27	0,23	0,18
10	0,51	0,35	0,30	0,26	0,20
11	0,56	0,39	0,33	0,29	0,22
12	0,61	0,42	0,36	0,31	0,24
13	0,66	0,46	0,39	0,34	0,26
14	0,71	0,50	0,42	0,36	0,28
15	0,76	0,53	0,45	0,39	0,30
16	0,82	0,57	0,48	0,42	0,32
17	0,87	0,60	0,51	0,44	0,34
18	0,92	0,64	0,54	0,47	0,36
19	0,97	0,67	0,57	0,49	0,38
20	1,02	0,71	0,60	0,52	0,40

Table A.1 *(2 of 2)*

Force N	Pressure (N/mm^2)				
	Anvil diameter mm				
	5	6	6,5	7	8
	Surface mm^2				
	19,63	28,26	33,17	38,47	50,24
21	1,07	0,74	0,63	0,55	0,42
22	1,12	0,78	0,66	0,57	0,44
23	1,17	0,81	0,69	0,60	0,46
24	1,22	0,85	0,72	0,62	0,48
25	1,27	0,88	0,75	0,65	0,50
26	1,32	0,92	0,78	0,68	0,52
27	1,38	0,96	0,81	0,70	0,54
28	1,43	0,99	0,84	0,73	0,56
29	1,48	1,03	0,87	0,75	0,58
30	1,53	1,06	0,90	0,78	0,60
31	1,58	1,10	0,93	0,81	0,62
32	1,63	1,13	0,96	0,83	0,64
33	1,68	1,17	0,99	0,86	0,66
34	1,73	1,20	1,03	0,88	0,68
35	1,78	1,24	1,06	0,91	0,70
36	1,83	1,27	1,09	0,94	0,72
37	1,89	1,31	1,12	0,96	0,74
38	1,94	1,34	1,15	0,99	0,76
39	1,99	1,38	1,18	1,01	0,78
40	2,04	1,42	1,21	1,04	0,80

Add, after 3.2.6, the following new subclause:

3.2.7 Increase in dimensions due to the bonding layer of enamelled rectangular wire

The increase in dimensions due to the bonding layer is the difference of the overall width or the overall thickness, respectively, with and without the bonding layer.

The overall width or the overall thickness, respectively, of the wire shall be measured according to 3.2.5.2. After removal of the bonding layer by means of a solvent or any other suitable agent or by any other method which does not damage the underlying coating, the measurement shall be repeated. The difference of the two mean values shall be reported as the increase in dimension due to the bonding layer.

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(ETD 33)

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