BUREAU OF INDIAN STANDARDS
DRAFT FOR COMMENTS ONLY

Draft Indian Standard

Winding Wires for Submersible Motors — Specification

Part 4 Specification for Individual Wires

Section 1 HR PVC Insulated Wires

(Second Revision of IS 8783 Part 4/Sec 1)

Winding Wire Sectional Committee, ETD 33	Last date for comments: 30-10-2025

FOREWORD

(Formal clauses of the draft will be added later)

This standard was initially published in 1978, covering PVC insulated winding wires for submersible motors designed for 85 °C operation. Subsequently, two related standards—IS 10051 : 1981, Specification for PVC insulated winding wires for submersible motors for 105 °C operation, and IS 12788 : 1989, Specification for PVC insulated winding wires overcoated with nylon for submersible motors—were introduced but later withdrawn.

This part of the series covers the requirements of high conductivity annealed round and stranded copper conductor PVC insulated winding wires for submersible motors.

In view of the prolonged absence of revision in the IS 8783 series, the associated winding wire standards for submersible motors are now being revised and circulated for public comments.

Although the committee did not observe significant technical changes in the construction or application of submersible winding wires, it approved wide circulation of the revised drafts with updated normative references to facilitate broader stakeholder consultation for following standards:

IS 8783	Winding wires for submersible motors — Specification
Part 1 : 1995	Part 1 Conductor data
Part 2 : 1995	Part 2 Materials for dielectric and jacket
Part 3 : 1995	Part 3 Methods of tests
Part 4/Sec l : 1995	Part 4 Specification for individual wires, Section 1 HR PVC insulated winding wires
Part 4/Sec 2 : 1995	Part 4 Specification for individual wires, Section 2 Cross linked polyethylene insulated and polyamide jacketed wires
Part 4/Sec 3 : 1995	Part 4 Specification for individual wires, Section 3 Polyester and polypropylene insulated winding wires

This revision includes the incorporation of amendments.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)'.The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft Indian Standard

WINDING WIRES FOR SUBMERSIBLE MOTORS — SPECIFICATION

PART 4 SPECIFICATION FOR INDIVIDUAL WIRES

SECTION 1 HR PVC INSULATED WIRES

(Second Revision of IS 8783 Part 4/Sec 1)

1 SCOPE

3.1 This draft standard (Part 4/Sec 1) covers the requirements of high conductivity annealed round and stranded copper conductor PVC insulated winding wires for submersible motors.

3.2 The wires covered in this standard are suitable for use where the combination of ambient temperature and temperature rise due to load results in conductor temperature not exceeding 85 °C.

This standard prescribes methods of tests for winding wires for submersible motors.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

3 GENERAL

Compliance to IS 8783 (Part 1), IS 8783 (Part 2) and IS 8783 (Part 3) which are integral part of this standard is essential.

3.1 Conductor for this type of wires shall conform to IS 8783 (Part 1).

3.2 Dielectric materials shall conform to Type 1 of IS 8783 (Part 2).

4 REQUIREMENTS

4.1 Thickness of Insulation

The minimum thickness of insulation shall not be less than the minimum value (t_i) specified in Tables 1 and/or 2.

4.2 Application of Insulation

The insulation shall be so applied that it fits closely on the conductor and it shall be possible to remove it without damage to the conductor.

4.3 Colour

The colour of insulation of winding wire shall be natural.

4.4 Overall Diameter

The overall diameter of winding wire shall not exceed the maximum value specified in Table 1 and 2.

4.5 The overall surface of finished winding wire shall be reasonably smooth.

4.6 High voltage Test (Water Immersion Test)

The wires shall withstand the test at room temperature when an ac voltage of 3 kV at frequency of 50 Hz is applied for one minute after immersion of the wire for minimum 12 h in water.

5 PACKING

The winding wire shall either be wound on spools/reels conforming to 14841 series.

6 MARKING

The winding wire shall carry following information marked on the label on spool/reel:

a) Reference to this Indian Standard for example IS 8783 (Part 4/Sec 1);
b) Manufacturer's name, brand name or trade-mark;
c) Size of conductor/maximum overall diameter, area, number of strands as applicable;
d) Length of conductor on spool/reel/coil;
e) Number of lengths on spool/reel/coil (if more than one);
f) Approximate gross mass;
g) Country of manufacture; and
h) Year of manufacture.

Table 1 Insulation Thickness and Overall Diameter of Wires with Round Solid Conductor
(Clauses 4.1 *and* 4.4*)*

Sl No.	**Conductor cross-Sectional Area,**	**Conductor Diameter,**	**Thickness of Insulation (t_i),**	**Overall Diameter**
	Nominal	***Nominal***	***Minimum***	***Maximum***
	mm^2	**mm**	**mm**	**mm**
(1)	(2)	(3)	(4)	(5)
i)	0.125	0.40	0.25	1.05
ii)	0.159	0.45	0.25	1.10
iii)	0.196	0.50	0.25	1.15
iv)	0.238	0.55	0.25	1.20
v)	0.283	0.60	0.25	1.25
vi)	0.332	0.65	0.30	1.35
vii)	0.385	0.70	0.30	1.45
viii)	0.442	0.75	0.30	1.50
ix)	0.502	0.80	0.30	1.55

Sl No.	**Conductor cross-Sectional Area,**	**Conductor Diameter,**	**Thickness of Insulation (t_i),**	**Overall Diameter**
	Nominal	***Nominal***	***Minimum***	***Maximum***
	mm^2	**mm**	**mm**	**mm**
(1)	(2)	(3)	(4)	(5)
x)	0.568	0.85	0.30	1.60
xi)	0.638	0.90	0.30	1.65
xii)	0.709	0.95	0.30	1.70
xiii)	0.785	1.0	0.30	1.75
xiv)	0.850	1.1	0.30	1.85
xv)	1.13	1.2	0.30	1.95
xvi)	1.33	1.3	0.30	2.05
xvii)	1.54	1.4	0.35	2.25
xviii)	1.77	1.5	0.35	2.35
xix)	2.01	1.6	0.35	2.45
xx)	2.27	1.7	0.35	2.55
xxi)	2.54	1.8	0.35	2.70
xxii)	2.84	1.9	0.35	2.80
xxiii)	3.14	2.0	0.45	3.10
xxiv)	3.46	2.1	0.45	3.20
xxv)	3.80	2.2	0.45	3.30
xxvi)	4.15	2.3	0.45	3.40
xxvii)	4.52	2.4	0.50	3.60
xxviii)	4.91	2.5	0.50	3.70
xxix)	5.31	2.6	0.50	3.80
xxx)	5.73	2.7	0.50	3.90
xxxi)	6.19	2.8	0.55	4.10
xxxii)	6.61	2.9	0.55	4.20
xxxiii)	7.07	3.0	0.55	4.30
xxxiv)	7.55	3.1	0.70	4.70
xxxv)	8.04	3.2	0.70	4.80
xxxvi)	8.55	3.3	0.70	4.90
xxxvii)	9.08	3.4	0.75	5.10
xxxviii)	9.62	3.5	0.75	5.20
xxxix)	10.18	3.6	0.75	5.30
xl)	10.75	3.7	0.75	5.40
xli)	11.34	3.8	0.75	5.50
xlii)	11.95	3.9	0.90	5.90
xliii)	12.57	4.0	0.90	6.00
xliv)	13.20	4.1	0.90	6.10
xlv)	13.85	4.2	0.90	6.20
xlvi)	15.21	4.4	0.95	6.50
xlvii)	16.62	4.6	0.95	6.70
xlviii)	18.10	4.8	0.95	6.90
xlix)	19.64	5.0	0.95	7.10

Table 2 Insulation Thickness and Overall Diameter of Wires with Stranded Conductor

(Clauses 4.1 *and* 4.4*)*

Sl No.	Conductor Cross-Sectional Area, Nominal	Conductor Composition No. of Wires/Wire Diameter, Nominal	Conductor Diameter, Nominal	Thickness of Insulation (t_i), Minimum	Overall Diameter, Maximum
	mm^2	**No./mm**	**mm**	**mm**	**mm**
(1)	(2)	(3)	(4)	(5)	(6)
i)	3.58	19/0.49	2.45	0.45	3.5
ii)	4.03	19/052	2.60	0.45	3.6
iii)	4.50	19/0.55	2.75	0.45	3.8
iv)	5.00	19/0.58	2.90	0.45	3.9
v)	5.55	19/0.61	3.05	0.50	4.10
vi)	6.11	19/0.64	3.20	0.50	4.30
vii)	6.90	19/0.68	3.40	0.50	4.60
viii)	7.95	19/0.73	3.65	0.50	4.90
ix)	9.08	19/0.78	3.90	0.60	5.20
x)	10.00	19/0.82	4.10	0.60	5.40
xi)	12.09	19/0.90	4.50	0.60	5.90
xii)	13.18	19/0.94	4.70	0.60	6.10
xiii)	14.00	19/0.97	4.85	0.70	6.40
xiv)	14.92	19/1.00	5.00	0.70	6.60
xv)	16.00	19/1.04	5.20	0.80	6.90
xvi)	18.06	19/1.10	5.50	0.80	7.20
xvii)	20.08	19/1.16	5.80	0.80	7.50
xviii)	21.30	27/1.00	6.15	0.80	7.90
xix)	25.50	27/1.10	6.80	0.80	8.60

ANNEX A

(*Foreword*)

LIST OF REFERRED STANDARDS

IS No.	*Title*
14841 series	Packaging of winding wires
IS 8783 (Part 1) : 1995	Winding wires for submersible motors — Specification Part 1 conductor data
IS 8783 (Part 2) : 1995	Winding wires for submersible motors — Specification Part 2 Materials for dielectric and jacket
IS 8783 (Part 3) : 1995	Winding wires for submersible motors — Specification Part 3 Methods of tests
IS 8783 (Part 4/Sec 2 : 1995	Winding wires for submersible motors — Specification Part 4 Specification for individual wires Section 2 crosslinked polyethylene insulated and polyamide jacketed wires (*first revision*)