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मानक

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Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 8008-4 (2003): Injection Moulded/Machined High Density Polyethylene (HDPE) Fittings for Potable Water Supplies, Part 4: Specific Requirements for Reducers [CED 50: Plastic Piping System]



“ज्ञान से एक नये भारत का निर्माण”

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“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
पेयजल पूर्ति के लिए अन्तःक्षेपण संचकित
एच डी पी ई फिटिंगें—विशिष्टि
भाग 4 रिड्यूसरों के लिए विशिष्ट अपेक्षाएँ
(पहला पुनरीक्षण)

Indian Standard

INJECTION MOULDED/MACHINED HIGH DENSITY
POLYETHYLENE (HDPE) FITTINGS FOR POTABLE
WATER SUPPLIES — SPECIFICATION

PART 4 SPECIFIC REQUIREMENTS FOR REDUCERS

(First Revision)

ICS 83.140.30;91.140.60

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard (Part 4) (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Plastic Piping System Sectional Committee had been approved by the Civil Engineering Division Council.

This standard covers general requirements for injection moulded/machined HDPE fittings which are used for connection by welding process to HDPE pipes by covered IS 4984 :1995 'High density polyethylene pipe for water supply (*fourth revision*)'.

This standard was first published in 1976. Keeping in view the developments in this field and considering revision of IS 4984 this standard has been revised.

The requirements of injection moulded/machined HDPE fittings are covered in nine parts. The other parts in this series are:

- (Part 1) : 2003 General requirements for fittings
- (Part 2) : 2003 Specific requirements for 90° bends
- (Part 3) : 2003 Specific requirements for 90° tees
- (Part 5) : 2003 Specific requirements for ferrule reducers
- (Part 6) : 2003 Specific requirements for pipe ends
- (Part 7) : 2003 Specific requirements for sandwich flanges
- (Part 8) : 2003 Specific requirements for reducing tees
- (Part 9) : 2003 Specific requirements for end caps

All revised parts have been aligned with IS 4984 with respect to grade of material, dimensional requirements, testing procedures and sampling methodology.

Provisions has been made for re-welding, in case any weld gets rejected. Weld length had been kept constant with a uniform tolerance.

Drawings have been revised from short neck pipe ends to long neck pipe ends. The range of diameter of fittings, weld length and clarity of the dimensions in the drawings had been incorporated in each part of the standard, wherever applicable.

This standard covers general requirements for materials, manufacture, dimensional requirements, etc, for reducers. Specific requirement of different types of fittings are covered in separate parts of this standard.

Fittings from 20 mm to 315 mm are manufactured by the injection moulding methods and machined, wherever so required and fittings of 355 mm and above shall be manufactured by machining process from thick walled extruded pipes or compression moulded slabs.

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 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

INJECTION MOULDED/MACHINED HIGH DENSITY POLYETHYLENE (HDPE) FITTINGS FOR POTABLE WATER SUPPLIES — SPECIFICATION

PART 4 SPECIFIC REQUIREMENTS FOR REDUCERS

(First Revision)

1 SCOPE

This standard (Part 4) covers the requirements for material, manufacture, dimensions, tolerances and marking for injection moulded and machined HDPE reducers for potable water supplies.

2 REFERENCES

The following standards 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 standard indicated below:

IS No.	Title
8008 (Part 1) : 2003	Injection moulded/machined high density polyethylene (HDPE) fittings for potable water supplies— Specification : Part 1 General requirements for fittings
4984 : 1995	High density polyethylene pipe for water supply (<i>fourth revision</i>)

3 REQUIREMENTS

3.1 General

The general requirements for material, manufacture, grade, sizes, performance requirements, methods of test, sampling and inspection shall conform to IS 8008 (Part 1) reducers from 20 mm to 315 mm shall be manufactured by the injection moulding methods and machined, wherever so required. Reducers of 355 mm and above shall be manufactured from machining process from thick walled extruded pipes or compression moulded slabs.

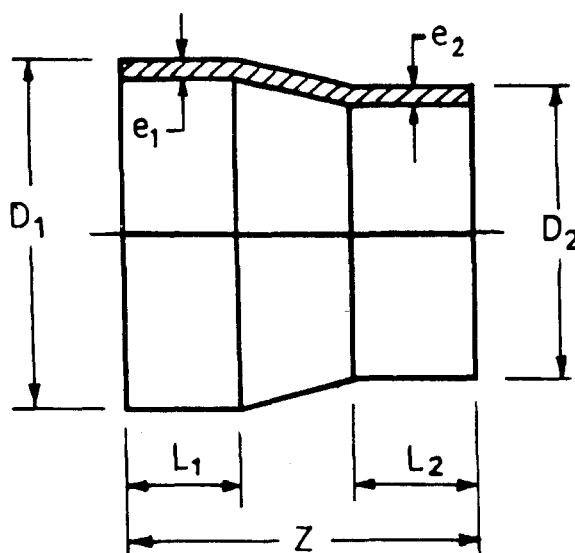
3.2 Manufacture

3.2.1 A typical illustration of injection moulded reducer is shown in Fig.1.

3.2.2 The two different diameters at either ends shall be concentric.

3.2.3 Laying Length

The overall laying length (Z) and tolerances thereon shall comply with those given in Table 1 read with Fig. 1.



e_1, e_2 — Wall thickness corresponding to IS 4984.

FIG. 1 REDUCER

Table 1 Dimensions for Injection Moulded Reducers
(Clause 3.2.3)

All dimensions in millimetres.

Sl No.	D_1	D_2	L_1	L_2	Z
(1)	(2)	(3)	(4)	(5)	(6)
i)	25	20	18	15	50
ii)	32	20	18	15	50
iii)	32	25	18	15	50
iv)	40	20	18	15	60
v)	40	25	18	15	60
vi)	40	32	18	15	60
vii)	50	25	18	15	65
viii)	50	32	18	15	65
ix)	50	40	18	15	65
x)	63	32	18	15	70
xi)	63	40	18	15	70
xii)	63	50	18	15	70
xiii)	75	40	19	15	70
xiv)	75	50	19	15	70
xv)	75	63	19	16	70
xvi)	90	50	24	15	80
xvii)	90	63	24	16	80
xviii)	90	75	24	21	80
xix)	110	63	30	18	95
xx)	110	75	30	21	95
xxi)	110	90	30	24	95
xxii)	125	75	34	21	105
xxiii)	125	90	34	24	105
xxiv)	125	110	34	30	105
xxv)	140	90	37	24	115
xxvi)	140	110	37	30	115
xxvii)	140	125	37	34	115
xxviii)	160	110	42	30	125
xxix)	160	125	42	34	125
xxx)	160	140	42	37	125
xxx i)	180	125	47	34	135
xxx ii)	180	140	47	37	135
xxx iii)	180	160	47	42	135
xxx iv)	200	140	52	37	140
xxx v)	200	160	52	42	140
xxx vi)	200	180	52	47	140
xxx vii)	225	160	57	42	165
xxx viii)	225	180	57	47	165
xxx ix)	225	200	57	52	165
xxx x)	250	180	62	47	180
xxx xi)	250	200	62	52	180
xxx xii)	250	225	62	57	180
xxx xiii)	280	200	72	52	205

Table 1 — Concluded

Sl No.	D_1	D_2	L_1	L_2	Z
(1)	(2)	(3)	(4)	(5)	(6)
xxxxiv)	280	225	72	57	205
xxxv)	280	250	72	62	205
xxxvi)	315	225	82	57	230
xxxvii)	315	250	82	62	230
xxxviii)	315	280	82	72	230

3.2.4 Overall length of reducers machined from thick walled pipes or compression moulded slabs shall comply with Table 2 read with Fig. 2.

3.2.5 The outside diameters and wall thickness of fitting at ends (for welding) shall be in accordance with IS 8008 (Part 1).

4 MARKING

4.1 Each reducer fitting shall be clearly marked at a prominent place, with the following information:

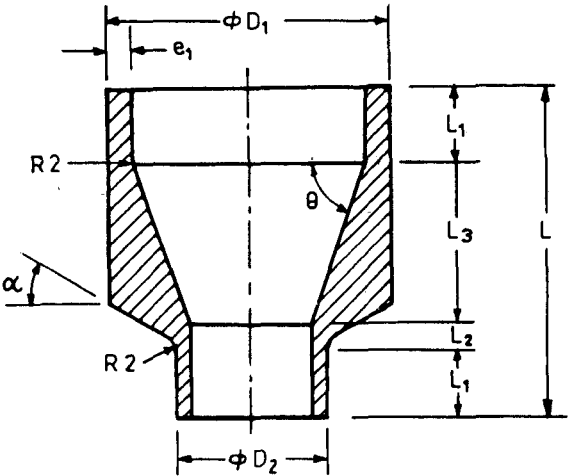
- a) Identification of source of manufacturer, and
- b) The size of the fittings, grade of material and

appropriate working pressure of IS 4984.

4.2 BIS Certification Marking

Each reducer fitting may also be marked with the Standard Mark.

4.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which a licence for the use of the Standard Mark may be granted to the manufacturers or the producers may be obtained from the Bureau of Indian Standards.



e_1, e_2 — Wall thickness corresponding to IS 4984.

FIG. 2 MACHINED REDUCER

Table 2 Dimensions of Reducers Machined from Thick Walled Pipe or
Compression Moulded Slab
(Clause 3.2.4)

Major Dia- meter	Minor Dia- meter	Nominal Pressure	Laying Length	Weld Length	Manufac- turing Reference	Manufac- turing Reference	Tolerance on L_3		Manufac- turing Reference	Manufac- turing Reference
D_1	D_2		L	L_1	L_2	L_3	+	-	θ	α
mm	mm	kg/cm ²	mm	mm	mm	mm	mm	mm	degree	degree
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
25	20	10	44.9	17.2	5	5.5	0	0	70	30
32	25	10	52.1	20	5	7.1	0.3	0.5	70	30
32	20	10	57.6	20	5	12.6	0.6	0.8	70	30
40	32	10	53.5	20	5	8.5	0.4	0.5	70	30
40	25	10	60.7	20	5	15.7	0.9	0.9	70	30
40	20	10	66.2	20	5	21.2	1.1	1.2	70	30
50	40	10	55.6	20	5	10.6	0.6	0.6	70	30
50	32	10	64.1	20	5	19.1	1.0	1.1	70	30
50	25	10	70.0	19.4	5	26.2	1.3	1.5	70	30
50	20	10	76.7	20	5	31.7	1.6	1.8	70	30
63	50	10	58.5	20	5	13.5	0.7	0.7	70	30
63	40	10	69.0	20	5	24.0	1.2	1.4	70	30
63	32	10	77.6	20	5	32.6	1.7	1.8	70	30
63	25	10	84.7	20	5	39.7	2.1	2.3	70	30
75	63	4	59.6	20	5	14.6	0.8	0.8	70	30
75	50	4	70.0	17.1	5	30.8	1.6	1.7	70	30
75	40	4	88.3	20	5	43.3	2.3	2.4	70	30
75	63	10	57.8	20	5	12.8	0.7	0.7	70	30
75	50	10	70.0	19.4	5	26.2	1.3	1.5	70	30
75	40	10	81.8	20	5	36.8	1.9	2.1	70	30
75	32	10	90.3	20	5	45.3	2.3	2.6	70	30
90	75	4	63.8	20	5	18.8	1.0	1.1	70	30
90	63	4	78.4	20	5	33.4	1.7	1.9	70	30
90	50	4	94.6	20	5	49.6	2.6	2.3	70	30
90	40	4	84.1	20	5	39.1	1.5	1.7	60	30
90	75	10	60.7	20	5	15.7	0.9	0.9	70	30
90	63	10	70.0	18.3	5	28.4	1.4	1.7	70	30
90	50	10	86.9	20	5	41.9	2.2	2.4	70	30
90	40	10	78.1	20	5	33.1	1.3	1.4	60	30
110	90	4	69.9	19.8	5	25.3	1.3	1.4	70	30
110	75	4	89.1	20	5	44.1	2.3	2.5	70	30
110	63	4	82.0	20	5	37.0	1.5	1.5	60	30
110	50	4	92.2	20	5	47.2	1.8	2.0	60	30
110	90	10	65.9	20	5	20.9	1.1	1.2	70	30
110	75	10	81.5	20	5	36.5	1.9	2.1	70	30
110	63	10	94.3	20	5	49.3	2.5	2.8	70	30
110	50	10	84.6	20	5	39.6	1.6	1.6	60	30
125	110	4	62.9	20	5	17.9	1.0	1.0	70	30
125	90	4	88.1	20	5	43.1	2.2	2.5	70	30
125	75	4	84.1	20	5	39.1	1.6	1.6	60	30

Table 2 — Continued

Major Dia- meter	Minor Dia- meter	Nominal Pressure	Laying Length	Weld Length	Manufac- turing Reference	Manufac- turing Reference	Tolerance on L_3		Manufac- turing Reference	Manufac- turing Reference
D_1	D_2		L	L_1	L_2	L_3	+	-	θ	α
mm	mm	kg/cm ²	mm	mm	mm	mm	mm	mm	degree	degree
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
125	63	4	93.2	20	5	48.2	1.8	2.0	60	30
125	110	10	60.7	20	5	15.7	0.9	0.9	70	30
125	90	10	81.5	20	5	36.5	1.9	2.1	70	30
125	75	10	77.9	20	5	32.9	1.3	1.4	60	30
125	63	10	86.0	20	5	41.0	1.6	1.7	60	30
140	125	4	63.3	20	5	18.3	1.0	1.0	70	30
140	110	4	81.1	20	5	36.1	1.8	2.0	70	30
140	90	4	83.7	20	5	38.7	1.5	1.6	60	30
140	75	4	70.0	17.9	5	29.2	1.0	1.0	45	30
140	125	10	60.8	20	5	15.8	0.8	0.9	70	15
140	110	10	76.5	20	5	31.5	1.7	1.8	70	30
140	90	10	78.0	20	5	33.0	1.3	1.4	60	30
140	75	10	87.9	20	5	42.9	1.7	1.8	60	30
160	140	4	69.6	20	5	24.6	1.3	1.4	70	30
160	125	4	87.9	20	5	42.9	2.3	2.0	70	30
160	110	4	83.3	20	5	38.3	1.5	1.6	60	30
160	90	4	76.3	20	5	31.3	1.1	1.1	45	15
160	140	10	66.2	20	5	21.2	1.1	1.2	70	30
160	125	10	82.0	20	5	37.0	2.0	2.1	70	30
160	110	10	78.2	20	5	33.2	1.3	1.3	60	30
160	90	10	91.3	20	5	46.3	1.0	2.0	60	30
180	160	4	69.9	20	5	24.9	1.3	1.4	70	30
180	140	4	94.5	20	5	49.5	2.6	2.8	70	30
180	125	4	87.7	20	5	42.7	1.7	1.8	60	30
180	110	4	76.1	20	5	31.1	1.0	1.2	45	30
180	160	10	65.7	20	5	20.7	1.0	1.2	70	30
180	140	10	86.9	20	5	41.9	2.2	2.4	70	30
180	125	10	81.4	20	5	36.4	1.5	1.5	60	30
180	110	10	91.2	20	5	46.2	1.8	2.0	60	30
200	180	4	69.6	20	5	24.6	1.3	1.4	70	30
200	160	4	94.5	20	5	49.5	2.6	2.8	70	30
200	140	4	91.7	20	5	46.7	1.8	1.9	60	30
200	125	4	78.6	20	5	33.6	1.2	1.2	45	15
200	180	10	66.2	20	5	21.2	1.1	1.2	70	30
200	160	10	86.9	20	5	41.9	2.2	2.4	70	30
200	140	10	84.8	20	5	39.8	1.6	1.6	60	30
200	125	10	94.7	20	5	49.7	1.9	2.1	60	30
225	200	4	75.9	20	5	30.9	1.6	1.8	70	30
225	180	4	80.0	20	5	35.0	1.4	1.4	60	30
225	160	4	70.0	17.9	5	29.2	1.0	1.1	45	15
225	140	4	83.2	20	5	38.2	1.3	1.4	45	15
225	200	10	70.0	19.5	5	26.0	1.4	1.4	70	30
225	180	10	92.1	20	5	47.1	2.4	2.7	70	30
225	160	10	92.8	20	10	42.8	1.7	1.8	60	15

Table 2 — Continued

Major Dia- meter	Minor Dia- meter	Nominal Pressure	Laying Length	Weld Length	Manufac- turing Reference	Manufac- turing Reference	Tolerance on L_3		Manufac- turing Reference	Manufac- turing Reference
D_1	D_2		L	L_1	L_2	L_3	+	-	θ	α
mm	mm	kg/cm ²	mm	mm	mm	mm	mm	mm	degree	degree
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
225	140	10	82.4	20	10	32.4	1.1	1.2	45	15
250	225	4	75.8	20	5	30.8	1.6	1.7	70	30
250	200	4	83.9	20	5	38.9	1.5	1.6	60	30
250	180	4	76.4	20	5	31.4	1.1	1.1	45	15
250	160	4	85.4	20	5	40.4	1.3	1.5	45	15
250	225	10	70.0	19.4	5	26.2	1.3	1.5	70	30
250	200	10	82.9	20	10	32.9	1.3	1.4	60	30
250	180	10	76.7	20	10	26.7	0.9	0.9	45	15
250	160	10	84.2	20	10	34.2	1.1	1.3	45	15
280	250	4	82.2	20	5	37.2	1.9	2.2	70	30
280	225	4	87.9	20	5	42.9	1.7	1.8	60	30
280	200	4	81.0	20	5	36.0	1.2	1.3	45	15
280	180	4	89.9	20	5	44.9	1.5	1.6	45	15
280	250	10	81.7	20	10	31.7	1.6	1.8	70	30
280	225	10	86.5	20	10	36.5	1.4	1.6	60	30
280	200	10	80.5	20	10	30.5	1.0	1.1	45	15
280	180	10	88.2	20	10	38.2	1.3	1.4	45	15
315	280	4	88.1	20	5	43.1	2.2	2.5	70	30
315	250	4	79.2	20	10	29.2	1.0	1.1	45	15
315	225	4	85.4	20	5	40.4	1.3	1.5	45	15
315	200	4	94.9	19.1	5	51.7	1.8	1.8	45	15
315	280	10	86.8	20	10	36.8	1.9	2.1	70	30
315	250	10	93.2	20	10	43.2	1.7	1.8	60	30
315	225	10	89.5	20	15	34.5	1.2	1.2	45	15
315	200	10	93.9	20	10	43.9	1.5	1.6	45	15
355	315	4	94.5	20	5	49.5	2.6	2.8	70	30
355	280	4	83.7	20	10	33.7	1.2	1.2	45	15
355	250	4	95.0	18.9	10	47.2	1.6	1.7	45	15
355	225	4	95.0	15.8	5	58.4	2.0	2.1	45	15
355	315	10	92.0	20	10	42.0	2.1	2.4	70	30
355	280	10	83.7	20	15	28.7	1.0	1.0	45	15
355	250	10	95.0	19.9	15	40.2	1.3	1.5	45	15
355	225	10	95.0	15.1	15	49.8	1.7	1.8	45	15
400	355	4	80.0	20	5	35.0	1.4	1.4	60	30
400	315	4	88.2	20	10	38.2	1.3	1.4	45	15
400	280	4	94.9	15.5	10	53.9	1.8	1.9	45	15
400	355	10	84.7	20	15	29.7	1.2	1.2	60	30
400	315	10	92.4	20	20	32.4	1.1	1.2	45	15
400	280	10	95.0	17.1	15	45.8	1.5	1.7	45	15
450	400	4	89.8	20	10	39.8	1.6	1.6	60	30
450	355	4	92.7	20	10	42.7	1.5	1.5	45	15
450	400	10	88.3	20	15	33.3	1.3	1.3	60	30
450	355	10	94.9	19.3	20	36.3	1.2	1.3	45	15
500	450	4	88.9	20	10	38.9	1.5	1.6	60	30

Table 2 — *Concluded*

Major Dia- meter	Minor Dia- meter	Nominal Pressure	Laying Length	Weld Length	Manufac- turing Reference	Manufac- turing Reference	Tolerance on L_3		Manufac- turing Reference	Manufac- turing Reference
D_1	D_2		L	L_1	L_2	L_3	+	-	θ	α
mm	mm	kg/cm ²	mm	mm	mm	mm	mm	mm	degree	degree
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
500	400	4	94.9	20	10	44.9	1.5	1.6	45	15
500	450	6	86.9	20	10	36.9	1.5	1.5	60	30
500	400	6	95.0	18.7	15	42.6	1.4	1.6	45	15
560	500	4	81.3	20	15	26.3	0.9	0.9	45	15
560	450	4	94.9	18.1	10	48.7	1.6	1.8	45	15
560	500	6	92.6	20	10	42.6	1.7	1.8	60	30
560	450	6	94.9	17	15	45.9	1.6	1.6	45	15
630	560	4	86.3	20	15	31.3	1.0	1.2	45	15
630	560	6	89.6	20	20	29.6	1.0	1.1	45	15

NOTE —Tolerance on various dimensions are given below:

<i>Dimension</i>	<i>Tolerances</i>
Laying Length, L	± 1 mm
Weld Length, L_1	± 1 mm
Manufacturing Reference, L_2	± 1 mm
Manufacturing Reference, θ	$\pm 1^\circ$
Manufacturing Reference, α	$\pm 1^\circ$

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