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भारतीय मानक मसौदा

कृषीय पम्पिंग प्रणाली के लिए टेपर — विशिष्टि

(आई एस 14263 का पहला पुनरीक्षण)

DRAFT Indian Standard

**TAPERS FOR AGRICULTURAL PUMPING SYSTEMS
— SPECIFICATION**

(First Revision of IS 14263)

ICS 43.060.40

Pumps Sectional Committee, MED 20

Last date for receipt of
comments is **10 November 2024**

FOREWORD

(Formal Clause to be added later)

This Indian standard was first published in 1995.

Tapers are used in pumping systems when the size of the suction piping or delivery piping is different than the suction or delivery size of the pump. To avoid entrapment of air in suction piping the flow cross section of the two ends are eccentric with reference to each other. The conical tapers for delivery piping have co-axial (concentric) flow cross section at the two ends.

It is understood that ergonomically designed tapers lead to higher pumping efficiency and considerably reduce friction losses. Since energy conservation is a key watchword in present circumstances, all efforts should be endured to encompass all possible steps to reduce pumping losses from the systems.

This revision has been taken up to keep pace with the latest technological developments and practices followed in the pump industry. This revision incorporates the amendments issued to the previous version along with the following changes:

- a) New materials for rust preventing coating has been included;
- b) New clause **9** has been added; and
- c) Editorial changes have been made.

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

**TAPERS FOR AGRICULTURAL PUMPING SYSTEMS
— SPECIFICATION**

(First Revision of IS 14263)

1 SCOPE

This standard lays down the requirements for the tapers used in agricultural pumping systems.

This standard covers the cast iron tapers used both in the suction and delivery sides. The tapers used in the suction side are eccentric tapers and in the delivery side are concentric tapers.

For connecting to the flanges of the pump end of the adjoining piping, the tapers may have either flanged ends or have socket-ends.

2 REFERENCE

The Indian Standards listed below contain provisions which, through reference in this text, constitute provision 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 listed below:

<i>IS No.</i>	<i>Title</i>
210 : 2009	Grey iron castings — Specification (<i>fifth revision</i>)
1538 : 1993	Cast iron fittings for pressure pipes for water, gas and sewage — Specification (<i>third revision</i>)
6418 : 1971	Specification for cast iron and malleable cast iron flanges for general engineering purposes
10805 : 2022	Foot-valves, reflux valves or nonreturnable valves and bore valves to be used in suction lines of agricultural pumping systems — Specification (<i>second revision</i>)

3 MATERIAL OF CONSTRUCTION

The tapers shall be made of grey cast iron conforming minimum to Grade FG 200 of IS 210.

4 DIMENSIONS

4.1 Dimensions for Eccentric Tapers and Concentric Tapers

The dimensions for the eccentric tapers shall conform to those given in Table 1 and the dimensions for the concentric tapers shall conform to those given in Tables 2 and 3.

4.2 Dimensions for Flanged Ends

The dimensions of the flanged ends, appropriate to the size DN or dn shown in Tables 1 and 2, are recommended as per rating PN 1.0 of IS 6418 or IS 10805. However, different pattern of dimensions to match the adjoining connections are permitted.

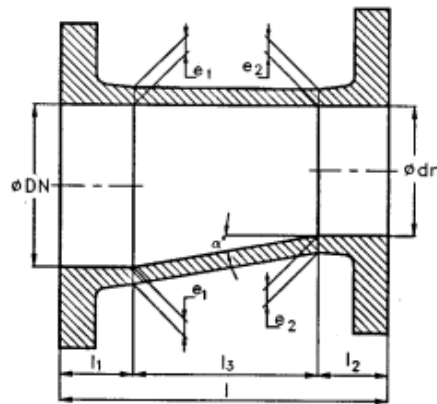
4.3 Dimensions for Socket Ends

The dimensions of the socket ends, both on the eccentric and the concentric tapers shall, unless otherwise agreed to between the users and the manufacturers, conform to those specified in IS 1538, appropriate to the size DN or dn, shown in Tables 1 and 3.

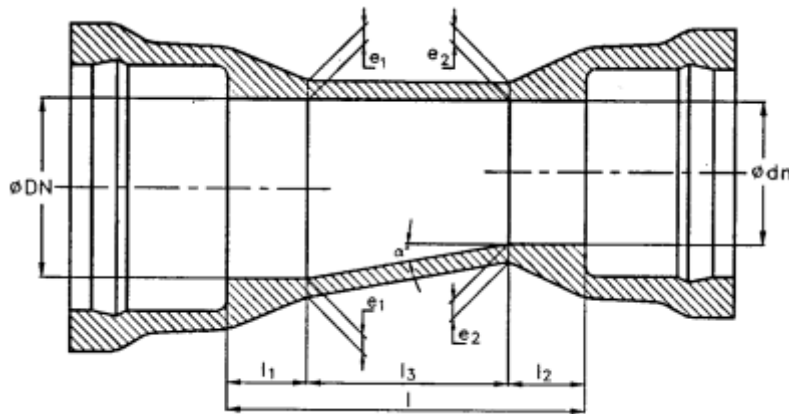
Table 1 Dimensions for Eccentric Tapers

(Clauses 4.1, 4.2 and 4.3)

All dimensions in millimetres



ECCENTRIC DOUBLE FLANGED TAPERS



ECCENTRIC DOUBLE SOCKET TAPERS

Sl No.	Nominal Size $DN \times dn$	Large Diameter			Small Diameter			l_2	l
		DN	e_1	l_1	dn	e_2	l_1		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	40 × 25	40	9.0	39.0	25	9.00	37.5	85.0	161.5
ii)	50 × 40	50	9.5	40.0	40	9.00	39.0	57.0	136.0
iii)	50 × 25	50	9.5	40.0	25	9.00	37.5	142.0	219.5
iv)	65 × 50	65	9.5	41.5	50	9.50	40.0	85.0	166.5
v)	65 × 40	65	9.5	41.5	40	9.00	39.0	142.0	222.5
vi)	80 × 65	80	10.0	43.0	65	9.50	41.5	85.0	169.5

vii)	80 × 50	80	10.0	43.0	50	9.50	40.0	170.0	253.0
viii)	80 × 40	80	10.0	43.0	40	9.00	39.0	227.0	309.0
ix)	100 × 80	100	10.5	45.0	80	10.00	43.0	113.5	201.5
x)	100 × 65	100	10.5	45.0	65	9.5	41.5	198.5	285.0
xi)	100 × 50	100	10.5	45.0	50	9.5	40.0	283.5	368.5
xii)	125 × 100	125	11.0	47.5	100	10.5	45.0	142.0	234.5
xiii)	125 × 80	125	11.0	47.5	80	10.0	43.0	255.0	345.5
xiv)	125 × 65	125	11.0	47.5	65	9.5	41.5	340.0	429.0
xv)	125 × 50	125	11.0	47.5	50	9.5	40.0	425.5	513.0
xvi)	150 × 125	150	12.0	50.0	125	11.0	47.5	142.0	239.5
xvii)	150 × 100	150	12.0	50.0	100	10.5	45.0	283.5	378.5
xviii)	150 × 80	150	12.0	50.0	80	10.0	43.0	397.0	490.0

NOTES

1 The values of e_1 and e_2 have been calculated from the following relationship and rounded up:

$$e_1 = \frac{14}{12}(7 \pm 0.02 DN); e_2 = \frac{14}{12}(7 \pm 0.02 dn);$$

2 The values of l_1 , and l_2 have been calculated by the following relationship:

$$l_1 = 35 + 0.1 DN; l_2 = 35 + 0.1 dn;$$

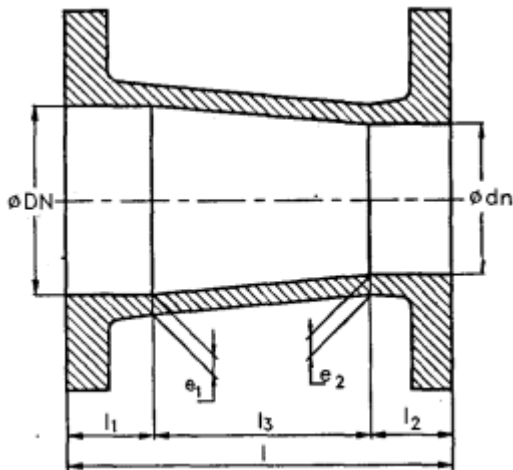
3 The pertinent flange dimensions as per IS 6418.

4 $d \leq 10^\circ$.

Table 2 Double Flange Tapers

(Clauses 4.1 and 4.2)

All dimensions in millimetres.



l_1	$35 + 0.1 DN$
l_2	$35 + 0.1 dn$
e_1	$\frac{14}{12}(7 + 0.02 DN)$
e_2	$\frac{14}{12}(7 + 0.02 dn)$

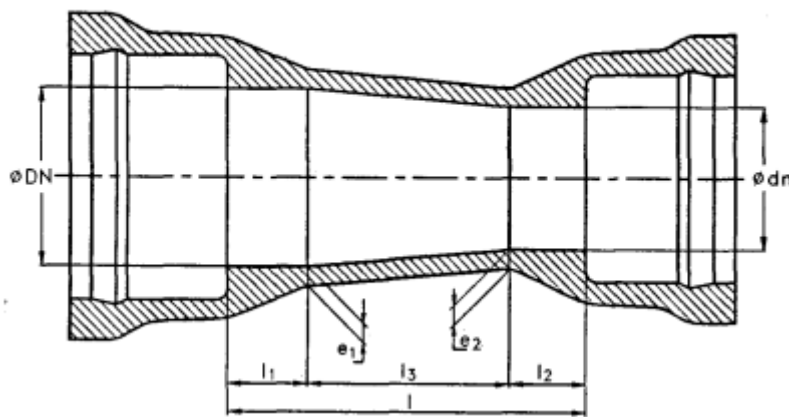
Sl No.	Nominal Size $DN \times dn$	Large diameter			Small Diameter			l_3	l	Mass (Approx) kg
		DN	e_1	l_1	dn	e_2	l_2			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
i)	100 × 80	100	10.5	45	80	10.0	43	112	200	12
ii)	125 × 80	125	11.1	47.5	80	10.0	43	309.5	400	20
iii)	125 × 100	125	11.1	47.5	100	10.5	45	307.5	400	22
iv)	150 × 80	150	11.7	50	80	10.0	43	307	400	23
v)	150 × 100	150	11.7	50	100	10.5	45	305	400	25
vi)	150 × 125	150	11.7	50	125	11.1	47.5	302.5	400	27
vii)	200 × 100	200	12.8	55	100	10.5	45	300	400	31

viii)	200 × 125	200	12.8	55	125	11.1	47.5	297.5	400	34
ix)	200 × 150	200	12.8	55	150	11.7	50	295	400	37
x)	250 × 125	250	14.0	60	125	11.1	47.5	292.5	400	41
xi)	200 × 150	250	14.0	60	150	11.7	50	290	400	44
xii)	200 × 200	250	14.0	60	200	12.8	55	285	400	50

Table 3 Double Socket Tapers

(Clauses 4.1 and 4.3)

All dimensions in millimetres.



l_1	$35 + 0.1 DN$
l_2	$35 + 0.1 dn$
e_1	$\frac{14}{12}(7 + 0.02 DN)$
e_2	$\frac{14}{12}(7 + 0.02 dn)$

Sl No.	Nominal Size $DN \times dn$	Large Diameter			Small Diameter			l_3	l	Mass (Approx) kg
		DN	e_1	l_1	dn	e_2	l_2			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
i)	100 × 80	100	10.5	47.5	80	10.0	43	185	275.5	—
ii)	125 × 80	125	11.1	47.5	80	10.0	43	232.5	323	—
iii)	125 × 100	125	11.1	47.5	100	10.5	45	227.5	320	—
iv)	150 × 80	150	11.7	50	80	10.0	43	280	373	—
v)	150 × 100	150	11.7	50	100	10.5	45	275	370	—
vi)	150 × 125	150	11.7	50	125	11.1	47.5	270	367.5	—
vii)	200 × 100	200	12.8	55	100	10.5	45	320	420	—
viii)	200 × 125	200	12.8	55	125	11.1	47.5	315	417.5	—
ix)	200 × 150	200	12.8	55	150	11.7	50	305	410	—
x)	250 × 125	250	14.0	60	125	11.1	47.5	360	467.5	—
xi)	250 × 150	250	14.0	60	150	11.7	50	350	460	—
xii)	250 × 250	250	14.0	60	200	12.8	55	340	455	—
xiii)	300 × 150	300	15.2	65	150	11.7	50	445	560	—
xiv)	300 × 200	300	15.2	65	200	12.8	55	435	555	—
xv)	300 × 250	300	15.2	65	250	14.0	60	430	555	—
xvi)	300 × 200	350	16.3	70	200	12.8	55	430	555	—
xvii)	300 × 250	350	16.3	70	250	14.0	60	425	555	—
xviii)	300 × 300	350	16.3	70	300	15.2	65	420	555	—

5 TESTING AND INSPECTION

5.1 Hydrostatic Pressure Testing

5.1.1 The eccentric tapers used in suction side shall not reveal any leakage or sweating, when subjected to a hydrostatic test pressure of 0.2 MPa for 5 minutes.

5.1.2 The concentric tapers used in delivery side shall not reveal any leakage or sweating, when subjected to a hydrostatic test pressure of 1 MPa for 5 minutes.

5.2 Dimensions and Finish

- a) The tapers shall conform to the dimensional requirements specified in 4, within the limits of tolerances specified in IS 6418 or IS 10805 for the dimensions of the flanged ends or IS 1538 for the dimensions of the socket ends; and
- b) For facilitating good gasketing, the gasket-surfaces of the flanged ends shall have a surface finish of 125 rms maximum.

6 PAINTING

The tapers shall be given a coating of tar or of a rust preventive paint. The coating shall however cover all the as-cast surfaces only.

CED (Cathodic Electro Deposition) may also be used since paint in contact with water can easily result in rusting/contamination of water. The rust preventive coating such as zinc coating/powder coating/PTFE coating may be used.

The machined surfaces shall be coated with a film of oil or varnish, so that the film, while providing rust-prevention during storage and transit shall not hinder good gasketing during installation.

7 MARKING

7.1 The tapers shall have the following markings either on a label or metal plate or as-cast:

- a) Brand name or model name of the manufacturer; and
- b) Sizes *DN* and *dn* in mm.

7.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

8 PACKING AND DESPATCH

The gasket-faces of the flanged ends shall be adequately protected from suffering scratching, denting or damage during transit or storage. Except for this, the tapers may be dispatched loose or packed as agreed to between the user and the manufacturer.

9. GUARANTEE OF WORKMANSHIP AND MATERIAL

The tapers shall be guaranteed by the manufacturer against the defects in material and workmanship under normal use and service either for a period of at least 15 months from the date of dispatch or 12 months from the date of commissioning, whichever is earlier.

(MED 20)