

INTERNATIONAL STANDARD

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Rotary core diamond drilling equipment — System B —

Part 2: Inch units

Matériel de forage rotatif au diamant avec carottage — Système B —

Partie 2: Unités en inches



Reference number
ISO 3552-2 : 1992 (E)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 3552-2 was prepared by Technical Committee ISO/TC 82, *Mining*, Sub-Committee SC 6, *Diamond core drilling equipment*.

ISO 3552 consists of the following parts, under the general title *Rotary core diamond drilling equipment — System B*:

- *Part 1: Metric units*
- *Part 2: Inch units*

Introduction

This part of ISO 3552 is published in parallel with ISO 3551-2 : 1992, *Rotary core diamond drilling equipment — System A — Part 2: Inch units*. The two International Standards cover rotary core diamond drilling equipment.

The two systems are referred to as System A and System B but this is not of any significance since the two systems are not intended as replacements for each other. The system to be adopted by the user will depend on his drilling requirements. The two sets of equipment are not interchangeable. System A is characterized by a series of hole sizes oriented to standard pipe sizes, with relatively wide "nesting", relatively greater reduction in hole diameters as the depth of hole increases, and employing relatively heavy casings between hole sizes. System B is characterized by a series of hole sizes specifically designed to "nest" closely, permitting relatively small reductions in hole diameters as the depth of the hole increases, and employing relatively thin casings between hole sizes. It should not be assumed that, for comparable hole sizes, the physical properties of similar elements of the two systems are equal.

When sizes of casing tubes and drill rods are required larger than specified in this part of ISO 3552, it is recommended that such sizes are selected from ISO 3551-2.

NOTE — Another system (System C) is described in ISO 8866 : 1991, *Rotary core diamond drilling equipment — System C*. It is characterized by a series of nesting holes providing small clearances between the hole wall and the equipment, making it possible to use thin-walled casing tubes. System C is considered to be a separate system to be applied in parallel with systems A and B; it is not interchangeable with these systems.

System B was originally drawn up and standardized in metric units, and the conversion was subsequently made into inches; therefore, in the event of a dispute, the values expressed in metric units shall be taken as the authentic values. (System B drawn up in metric units is dealt with in ISO 3552-1).

Rotary core diamond drilling equipment — System B —

Part 2: Inch units

1 Scope

This part of ISO 3552 establishes the nomenclature and lays down the leading dimensions to ensure interchangeability within the limits of System B of the following equipment:

- a) drill rods and couplings, fishing rods and couplings;
- b) casing tubes, casing drive shoes, casing shoe bits, casing bits and sediment tubes;
- c) core barrels, core bits, core lifters and reaming shells.

It specifies the characteristics of a range of equipment for drilling holes having diameters from 1.42 in to 5.74 in and yielding cores from 0.87 in to 4.72 in in diameter. The relation between

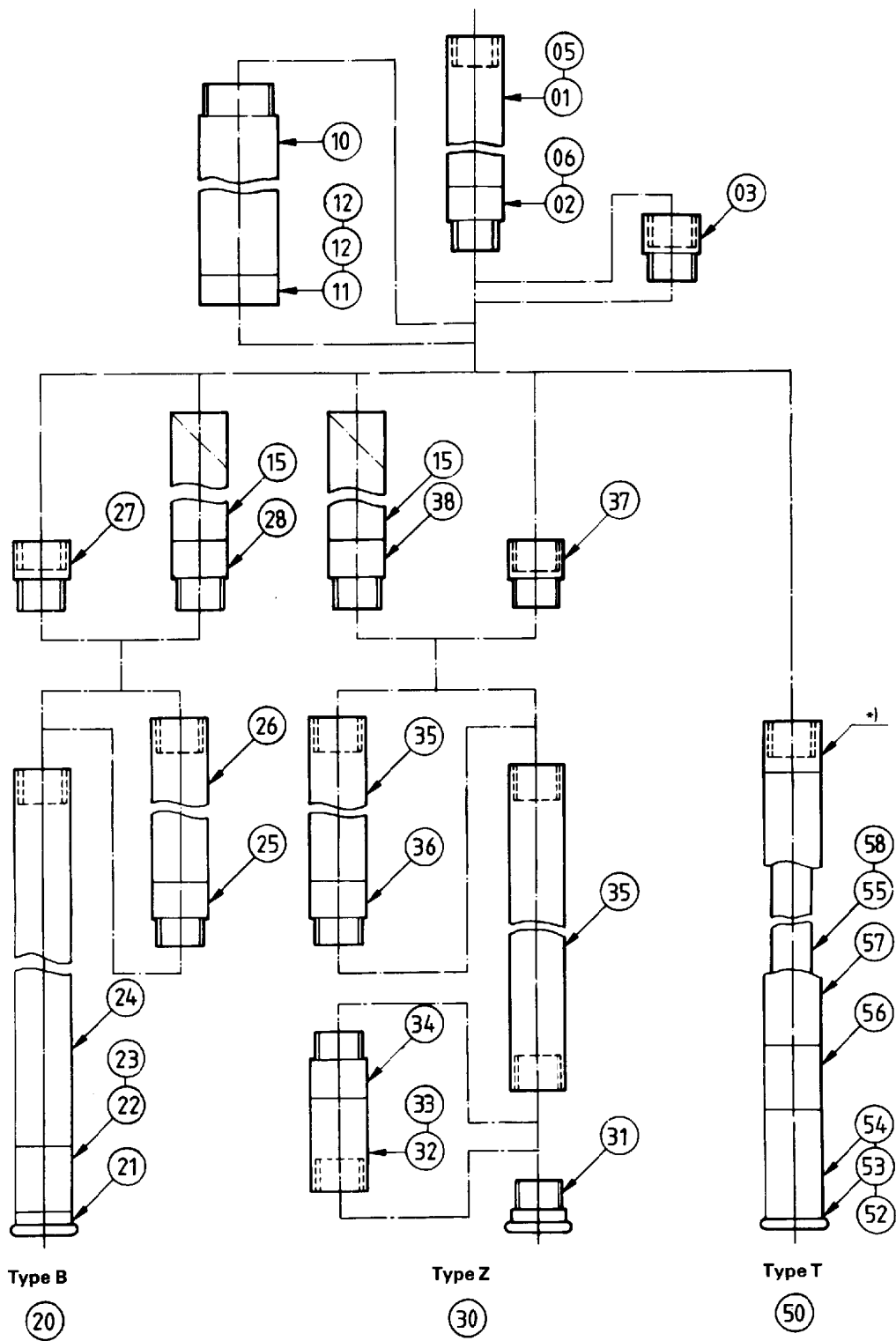
drilled hole diameter (size designation), core diameter (set inside diameter of the bit) and outside diameter and inside diameter ($D_1 \times D_2$) for core barrels, coring tubes and sediment tubes is shown in table 1.

NOTE — The title of this part of ISO 3552 specifies diamond core drilling, but it is also possible to use other cutting materials.

2 Designation

Items manufactured in accordance with this part of ISO 3552 shall be designated by its number followed by the two numbers as listed in table 2.

The relationship of the various components is given in figure 1.



*) Core barrel head: only thread for connection to drill rod is standardized.

Figure 1 — Details of connections (see table 2)

Table 1 — Relationship of components

Size designation (hole diameter)	Core diameter			Outside diameter $\times$ inside diameter ($D_1 \times D_2$)				
	Type			Casing tube	Sediment tube	Core barrel (outer tube)		
	B	T	Z			B	T	Z
36	0.866	0.866	—	—	—	1.319 $\times$ 0.917	1.386 $\times$ 1.142	—
46	1.26	1.26	1.102	1.738 $\times$ 1.463	—	1.738 $\times$ 1.463	1.78 $\times$ 1.567	1.738 $\times$ 1.295
56	1.653	1.653	1.338	2.132 $\times$ 1.856	2.132 $\times$ 1.856	2.132 $\times$ 1.856	2.173 $\times$ 1.929	2.132 $\times$ 1.689
66	2.047	2.047	1.732	2.53 $\times$ 2.254	2.53 $\times$ 2.254	2.53 $\times$ 2.254	2.567 $\times$ 2.323	2.53 $\times$ 2.083
76	2.441	2.441	2.126	2.923 $\times$ 2.648	2.923 $\times$ 2.648	2.923 $\times$ 2.648	2.961 $\times$ 2.717	2.923 $\times$ 2.476
86	2.835	2.835	2.441	3.317 $\times$ 3.041	3.317 $\times$ 3.041	3.317 $\times$ 3.041	3.354 $\times$ 3.11	3.317 $\times$ 2.87
101	3.425	—	2.953	3.858 $\times$ 3.476	3.858 $\times$ 3.476	3.858 $\times$ 3.476	—	3.858 $\times$ 3.476
116	4.016	—	3.543	4.449 $\times$ 4.067	4.449 $\times$ 4.067	4.449 $\times$ 4.067	—	4.449 $\times$ 4.067
131	4.606	—	4.134	5.039 $\times$ 4.657	5.039 $\times$ 4.657	5.039 $\times$ 4.657	—	5.309 $\times$ 4.657
146	5.197	—	4.274	5.63 $\times$ 5.248	5.63 $\times$ 5.248	5.63 $\times$ 5.248	—	5.63 $\times$ 5.248

Table 2 — Designation reference numbers

Drill and fishing rods		30 Core barrels, Type Z	
01	Drill rods	31	Bits
02	Drill-rod couplings	32	Core-lifter cases
03	Drill-rod substitutes	33	Core lifter
05	Fishing rods	34	Core-lifter couplings
06	Fishing-rod couplings	35	Core and extension tubes
Casing tubes		36	Extension couplings
10	Casing tubes	37	Heads
11	Casing drive shoes	38	Heads with sediment-tube threads
12	Casing shoe bits	50 Double-tube core barrels, Type T	
13	Casing bits	52	Bits
Sediment tubes		53	Core-lifter cases
15	Sediment tubes	54	Core lifters
20 Core barrels, Type B		55	Inner tubes
21	Bits	56	Reaming shells
22	Core-lifter cases	57	Outer tubes
23	Core lifter	58	Extension tubes
24	Core tubes	Threads	
25	Extension couplings	61	Threads
26	Extension tubes		
27	Heads		
28	Heads with sediment-tube threads		

3 Materials

Materials used in the manufacture of the equipment specified in this part of ISO 3552 shall have the mechanical properties specified in table 3.

The method by which the mechanical properties of tubes are obtained is left to the manufacturer.

Table 3 — Mechanical properties

Component	Tensile strength	Yield stress	Percentage elongation after fracture
	R_m , min. lbf/in ²	R_e , min. lbf/in ²	A_{2in} , min. %
Parallel wall rods	100 000	80 000	13
Upset or forged ends of rods	95 000	55 000	14
Rod couplings and adaptors	114 000	100 000	15
Casing outside diameter < 3.543 in	100 000	80 000	13
Casing outside diameter > 3.543 in	95 000	55 000	14

4 Dimensions and tolerances

4.1 General

All dimensions and tolerances shall be in accordance with tables 5 to 39. The dimensions and tolerances for the threads specified in tables 5 to 39 are given in table 40.

All dimensions given in this part of ISO 3552, unless otherwise stated, are in inches (see Introduction).

All items shown in the different figures have a right-hand thread. Where a left-hand thread is necessary, it is stipulated for each individual case in the footnotes to the figure or to the corresponding table.

NOTE — In System B, tolerances are specified in accordance with ISO 286-2 : 1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*.¹⁾

4.2 Tolerances for blank tubing

4.2.1 Tolerances on outside diameters shall be ± 0.008 in for diameters less than 1.6 in and ± 0.5 % for diameters greater than or equal to 1.6 in.

4.2.2 Tolerances on the inside diameter shall be within the limits imposed by the outside diameter and the eccentricity tolerances (see 4.3).

4.3 Eccentricity

The eccentricity is defined as the distance between the centres of the outside and inside diameters expressed as a percentage of the nominal wall thickness Q and may not exceed 10 %. The eccentricity is calculated according to the following formula :

$$\frac{Q_{\max} - Q_{\min}}{2 Q_{\text{nom}}} \times 100$$

where $Q_{\max}$ and $Q_{\min}$ are values of the wall thickness measured in the same section.

The value of the nominal wall thickness shall be calculated according to the following formula :

$$\frac{D_1 - D_2}{2}$$

where D_1 and D_2 are mean values for the outside and inside diameters, respectively, determined in accordance with stated tolerances.

4.4 Straightness

The straightness, along the entire length of the tubes as well as at the tube ends, shall be checked by rotating the tube against a calibrated straightedge provided with a suitable measuring device. Along the total length of the tube, the maximum difference between indicator readings shall not be greater than the values indicated in table 4.

Table 4 — Maximum permissible deviations in straightness

Length of tube in	Maximum difference between indicator readings in
Up to 59 (incl.)	0.079
From 59 up to 118 (incl.)	0.118
From 118 up to 177 (incl.)	0.157
From 177 up to 236 (incl.)	0.197

The requirement for straightness at the tube ends is illustrated in figure 2.

¹⁾ In ISO 286-2, the limit deviations are given only in metric units. The corresponding values in inches are to be found by conversion.

Dimensions in inches

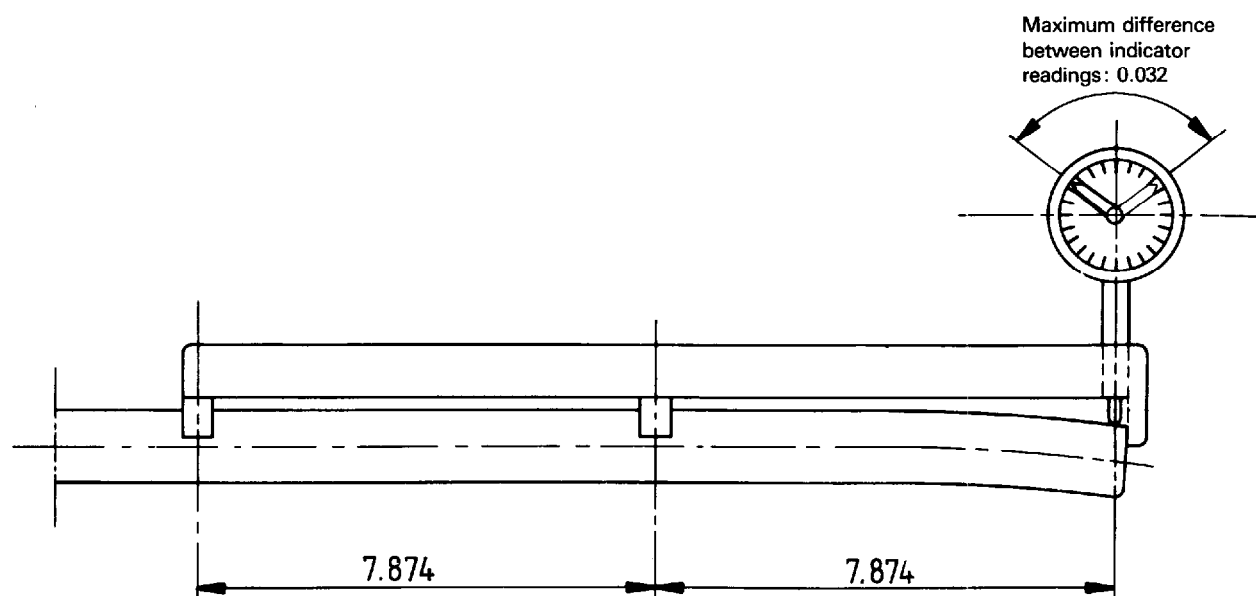


Figure 2 — Requirements for straightness at the tube ends

Table 5 — Nomenclature and basic dimensions for drill rods and casings and their related diamond set items

Drill rod size	Rod tube	Rod coupling	Casing flush jointed size	Casing		Casing bit		Casing shoe	
	O.D.	I.D.		O.D.	I.D.	Set O.D.	Set I.D.	Set O.D.	Set I.D.
33	1.327	0.596	46	1.746	1.473	1.815	1.382	1.815	1.461
	1.311	0.585		1.730	1.453	1.807	1.374	1.807	1.453
42	1.661	0.872	56	2.140	1.866	2.209	1.776	2.209	1.854
	1.646	0.860		2.124	1.846	2.201	1.768	2.201	1.846
50	1.976	0.872	66	2.541	2.264	2.602	2.169	2.602	2.248
	1.961	0.860		2.518	2.244	2.594	2.161	2.594	2.240
			76	2.935	2.658	2.996	2.563	2.996	2.642
				2.911	2.638	2.988	2.555	2.988	2.634
			86	3.333	3.051	3.390	2.967	3.390	3.035
				3.301	3.031	3.382	2.959	3.382	3.027
			101	3.874	3.492	3.980	3.410	3.980	3.469
				3.843	3.460	3.972	3.402	3.972	3.461
			116	4.469	4.087	4.571	4.000	4.571	4.059
				4.429	4.047	4.563	3.992	4.563	4.051
			131	5.059	4.677	5.161	4.591	5.161	4.650
				5.020	4.637	5.154	4.583	5.154	4.642
			146	5.65	5.284	5.752	5.181	5.752	5.241
				5.61	5.228	5.744	5.173	5.744	5.233

NOTE — The following common abbreviations are sometimes used in tables in the English version for the sake of simplicity:

O.D. = outside diameter

I.D. = inside diameter.

Table 6 — Nomenclature and basic dimensions for core barrels and their related diamond set items

Core barrel type			Coring bits		Reaming shells	Kerf width in	Kerf area in ²	Core area in ²	Hole area in ²	Core-to-hole ratio %
B	T	Z	Set I.D.	Set O.D.	Set O.D.					
36	36		0.858 0.850	1.421 1.413	1.433 1.425	0.281	1.015	0.589	1.604	36.5
46	46		1.258 1.244	1.815 1.807	1.827 1.819	0.281	1.364	1.246	2.61	47.8
		46	1.094 1.086	1.815 1.807	1.827 1.819	0.36	1.655	0.955	2.61	36.5
56	56		1.646 1.638	2.209 2.201	2.220 2.213	0.281	1.711	2.146	3.857	55.9
		56	1.331 1.323	2.209 2.201	2.220 2.213	0.438	2.45	1.407	3.857	36.5
66	66		2.039 2.031	2.602 2.594	2.614 2.606	0.281	2.058	3.292	5.35	61.6
		66	1.724 1.716	2.602 2.594	2.614 2.606	0.438	2.993	2.357	5.35	44.1
76	76		2.433 2.425	2.996 2.988	3.008 3.000	0.281	2.407	4.68	7.087	66.7
		76	2.118 2.110	2.996 2.988	3.008 3.000	0.438	3.537	3.55	7.087	50
86	86		2.827 2.819	3.390 3.382	3.402 3.394	0.281	2.756	6.311	9.067	69.8
		86	2.433 2.425	3.390 3.382	3.402 3.394	0.438	4.387	4.68	9.067	53
101			3.417 3.409	3.980 3.972	3.992 3.984	0.281	3.278	9.215	12.493	72.7
		101	2.955 2.947	3.980 3.972	3.992 3.984	0.517	5.645	6.848	12.493	54.9
116			4.008 4.000	4.571 4.563	4.583 4.575	0.281	3.801	12.666	16.467	76.8
		116	3.535 3.527	4.571 4.563	4.583 4.575	0.517	6.605	9.862	16.467	59.7
131			4.658 4.650	5.161 5.154	5.173 5.165	0.281	4.323	16.655	20.988	79.4
		131	4.126 4.118	5.161 5.154	5.173 5.165	0.517	7.566	13.422	20.988	64
146			5.189 5.181	5.752 5.744	5.764 5.756	0.281	4.846	21.213	26.059	81.4
		146	4.716 4.708	5.752 5.744	5.764 5.756	0.517	8.527	17.532	26.059	67.3

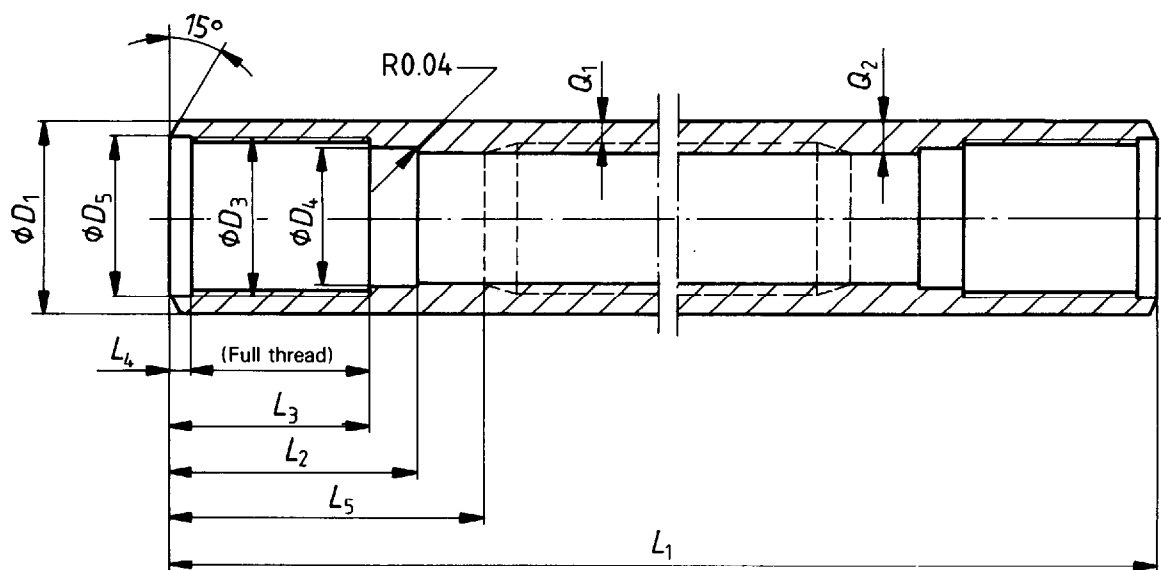


Figure 3 — Drill rod (see table 7)

Table 7 — Drill rod

Size	Nominal length (including coupling)	L_1		D_1	D_3	D_4	D_5	Q_1^{*1}	Q_2^{*1}	L_2	L_3	L_4	L_5
			tol.	± 0.008	Thread CR1	H11	$+ 0.008$ $+ 0.005$	min.	min.	js14	min.	js14	min.
33	19.685	17.323	± 0.059	1.319	28	0.961	1.102	0.128	0.185	1.772	1.378	0.236	2.165
42	59.055	56.693	± 0.059	1.654	36	1.291	1.417	0.138	0.187	2.165	1.772	0.236	2.559
50	118.11	115.748	± 0.098	1.969	41.5	1.488	1.634	0.177	0.246	2.559	2.165	0.315	2.953

*) The choice of dimensions Q_1 and Q_2 is left to the manufacturer provided that they are not less than the stated values.

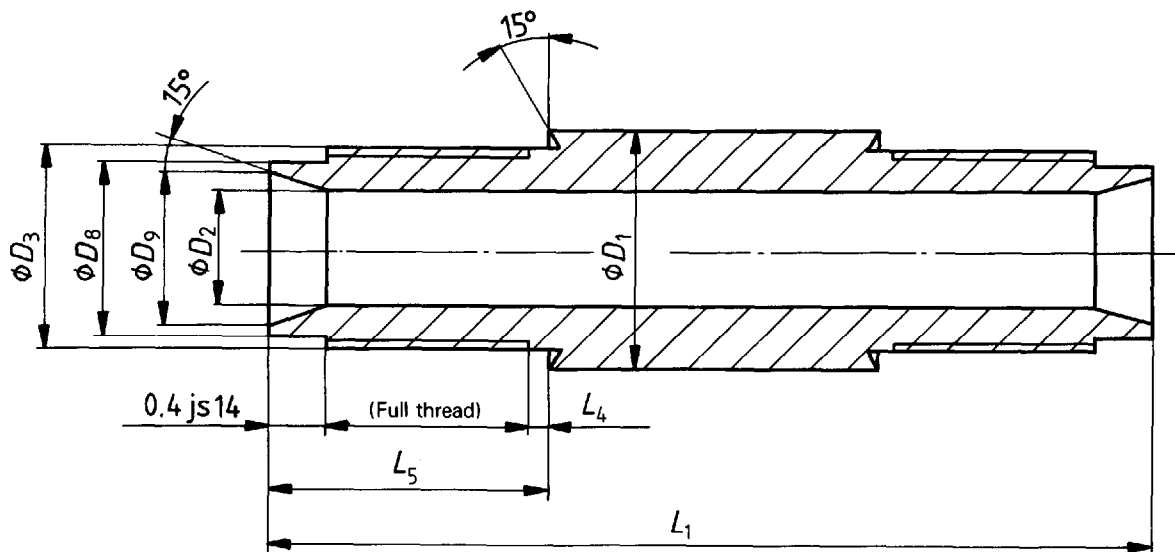


Figure 4 — Drill-rod coupling (see table 8)

Table 8 — Drill-rod coupling

Size	D_1 + 0.008 0	D_2 JS13	D_3 Thread CR1	D_8 d11	D_9 JS13	L_1 js14	L_4 max.	L_5 js14
33	1.319	0.591	28	0.961	0.748	5.512	0.197	1.575
42	1.654	0.866	36	1.291	1.063	6.299	0.197	1.969
50	1.969	0.866	41.5	1.488	1.26	7.087	0.276	2.362

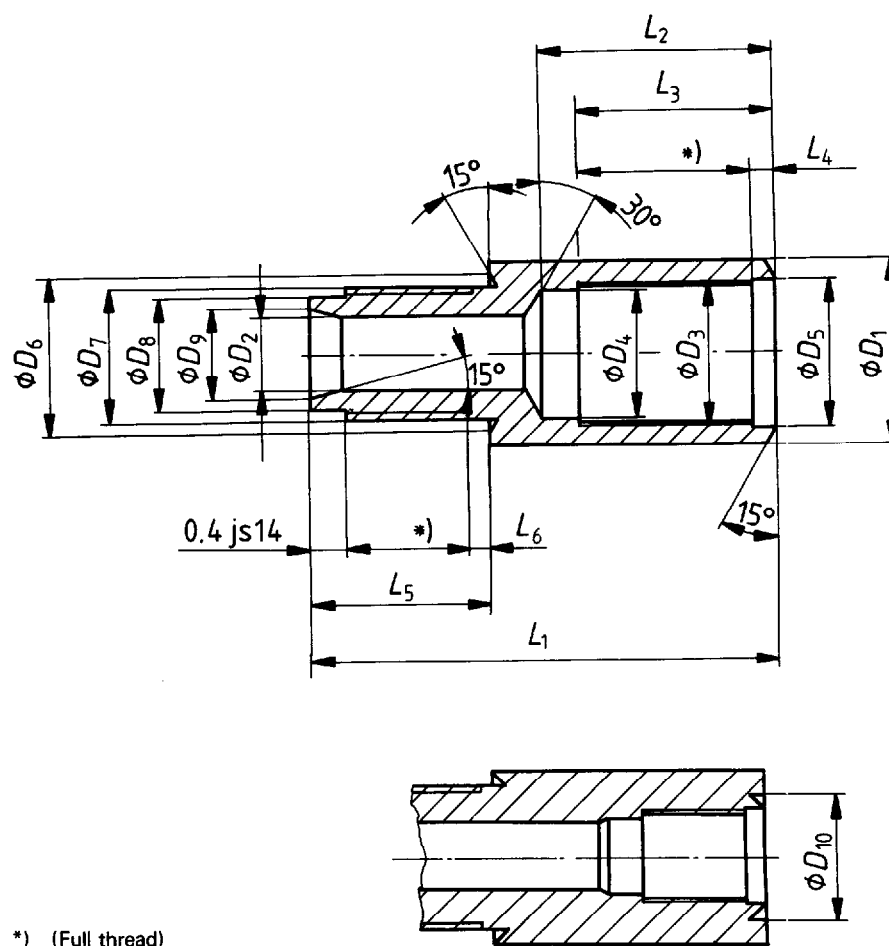


Figure 5 — Drill-rod substitute (see table 9)

Table 9 — Drill-rod substitute

Size	D_1 + 0.008 0	D_2 JS13	D_3 Thread CR1	D_4 H11	D_5 + 0.008 + 0.005	D_6 + 0.020 + 0.008	D_7 Thread CR1	D_8 d11	D_9 JS13	D_{10} + 0.020 + 0.008	L_1 js14	L_2 js14	L_3 js14	L_4 js14	L_5 js14	L_6 max.			
33 × 42 ¹⁾	1.654	0.591	36	1.291	1.417	1.319	28	0.961	0.748	—	4.331	2.165	1.772	0.236	1.575	0.197			
33 × 50 ¹⁾	1.969		41.5	1.488	1.634						5.118	2.559	2.165	0.315					
42 × 50 ¹⁾		0.866				28	0.961	1.102	36						1.291		1.063	4.331	1.772
42 × 33 ²⁾	1.654		41.5	1.488	1.26					1.654	5.118	2.165	1.772						
50 × 33 ²⁾														1.969		36			
50 × 42 ²⁾																			

1) Pin thread smaller than box thread.

2) Pin thread larger than box thread.

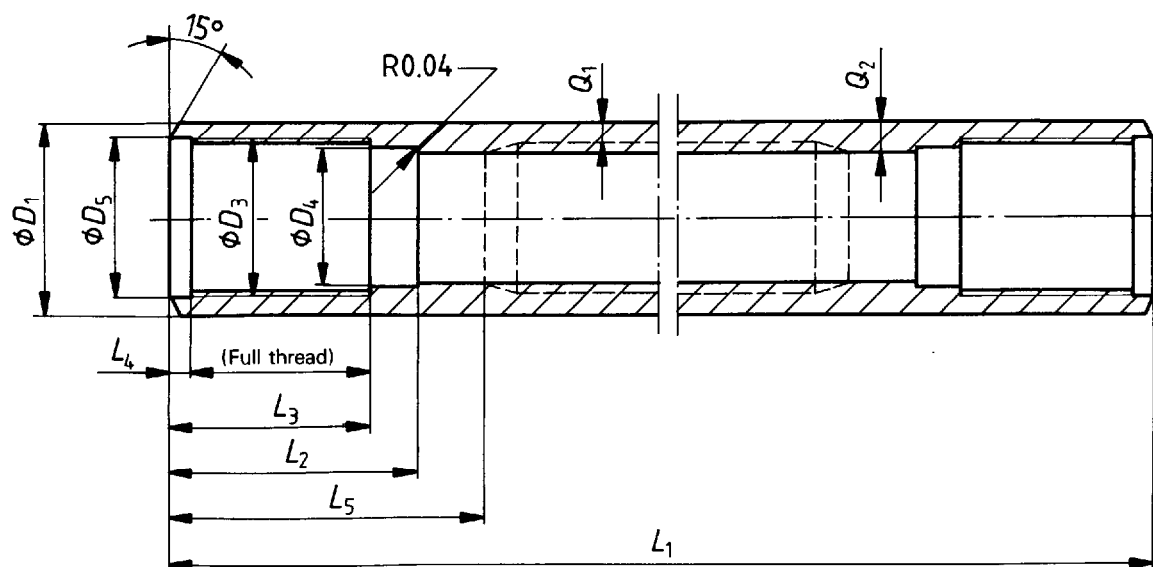


Figure 6 — Fishing rod (see table 10)

Table 10 — Fishing rod

Size	Nominal length (including coupling)	L_1		D_1	D_3	D_4	D_5	$Q_1^{**})$	$Q_2^{**})$	L_2	L_3	L_4	L_5
			tol.	+ 0.008	Thread CR1*)	H11	+ 0.008 + 0.005	min.	min.	js14	min.	js14	min.
33	118.1 236.2	115.748 233.858	± 0.098 ± 0.098	1.319	28	0.961	1.102	0.128	0.185	1.772	1.378	0.236	2.165
42				1.654	36	1.291	1.417	0.138	0.187	2.165	1.772		2.559
50				1.969	41.5	1.488	1.634	0.177	0.246	2.559	2.165		2.953

*) Left-hand thread.

**) The choice of dimensions Q_1 and Q_2 is left to the manufacturer provided that they are not less than the stated values.

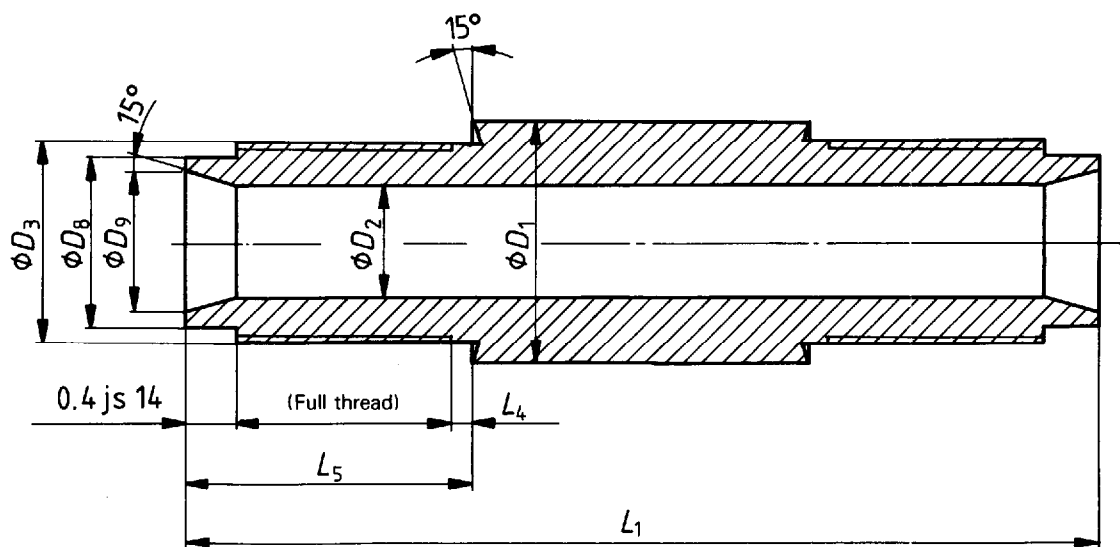


Figure 7 — Fishing-rod coupling (see table 11)

Table 11 — Fishing-rod coupling

Size	D_1 + 0.008 0	D_2 JS13	D_3 Thread CR1*)	D_8 d11	D_9 JS13	L_1 js14	L_4 max.	L_5 js14
33	1.319	0.591	28	0.961	0.748	5.512	0.197	1.575
42	1.654	0.866	36	1.291	1.063	6.299		1.969
50	1.969		41.5	1.488	1.26	7.087	0.276	2.362

*) Left-hand thread.