TC67

INTERNATIONAL STANDARD ISO 3962

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Materials and equipment for petroleum and natural gas industries — Tool joints for steel drill pipe for oil or natural gas wells

Matériel et équipement pour les industries du pétrole et du gaz naturel — Raccords de tiges de forage en acier pour puits de pétrole ou de gaz naturel

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FOREWORD

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3962 was developed by Technical Committee ISO/TC 67, *Materials and equipment for petroleum and natural gas industries*, and was circulated to the member bodies in March 1976.

It has been approved by the member bodies of the following countries :

Austria	Germany	Romania
Belgium	Hungary	Spain
Brazil	Iran	Turkey
Canada	Italy	United Kingdom
Chile	Japan	Yugoslavia
Czechoslovakia	Korea, Rep. of	
France	Mexico	

The member body of the following country expressed disapproval of the document on technical grounds :

U.S.A.

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CONTENTS

Materials and equipment for petroleum and natural gas industries — Tool joints for steel drill pipe for oil or natural gas wells

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the characteristics of tool joints for steel drill pipe in conformity with ISO 2644 for use in oil or natural gas wells. It covers only those tool joints that are connected to the drill pipes by butt welding. It does not deal with tool joints connected to the drill pipes by shrink-on threads.

2 DEFINITIONS

For the purposes of this International Standard, the following definitions apply.

2.1 tool joint : The two components, one with a male (pin) thread and the other with a female (box) thread attached to the drill pipe by welding.

2.2 rotary shouldered connection : The pin and box which are threaded and machined with shoulders to mate with each other.

3 DATA TO BE GIVEN BY THE PURCHASER

The purchase order (tool joints only, drill pipes with tool joints) shall list the following elements which are necessary for the precise specification of tool joints.

3.1 Nominal size and style (according to table 1 or 6).

3.2 Taper shoulder or square shoulder (figure 1).

3.3 Tool joints with hard facing (see 5.1.2).

3.4 Anti-galling treatment of threaded rotary shouldered connections (see 5.1.3).

3.5 Optional markings by agreement between purchaser and manufacturer.

3.5.1 Useful length between shoulders, rounded off to the nearest 5 mm (applicable by the enterprise carrying out the welding work).

3.6 When ordering tool joints only, it is necessary to specify the size, style, weight and grade of drill pipe to which the tool joints are to be attached.

4 DESIGNATION

A tool joint manufactured according to this International Standard shall be designated by

- its size in millimetres;
- the style of the connection;
- a reference to this International Standard.

Example : **Tool joint, NC 38 (88,9 IF), according to ISO 3962.**

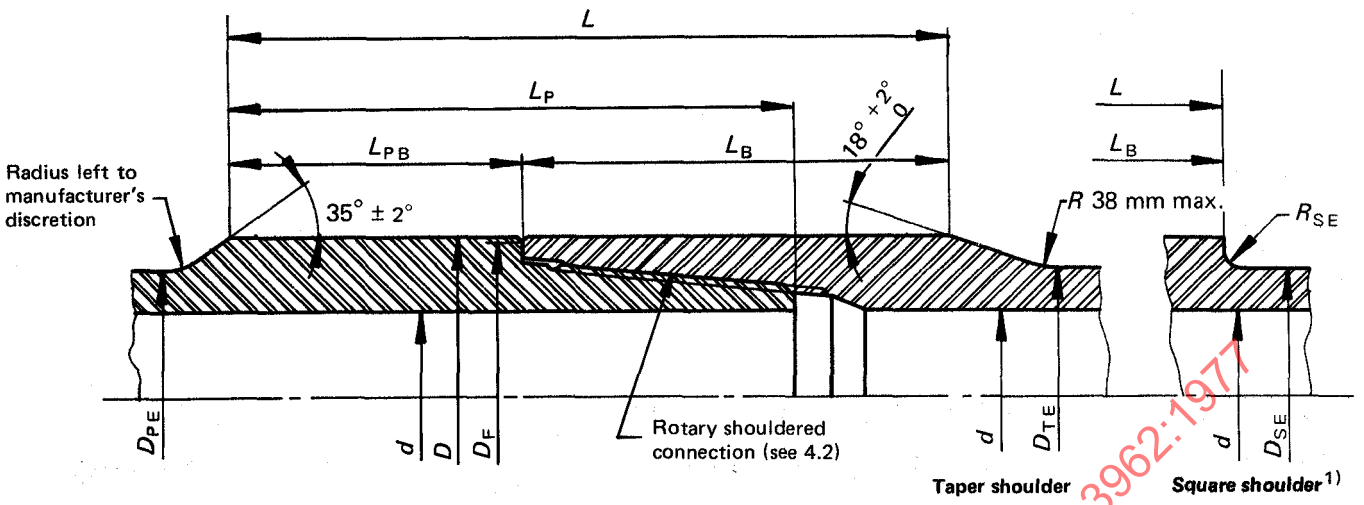


FIGURE 1 — **Tool joint — Taper shoulder and square shoulder** (see table 1)

Notes to table 1.

1) The tool joint designation (column 1) indicates the dimension and style of the applicable connection.

2) E.U. : external upset

I.U. : internal upset

I.E.U. : external and internal upset.

3) Masses per unit length, threads and tool joints (column 3) are indicated for identification in the order.

4) Neck diameters (D_{PE} and D_{TE}) and internal diameters (d) of tool joints before welding are at the manufacturer's option. Table 1 indicates finished dimensions after final machining of the assembly.

5) The inside diameter (column 6) does not apply to the box, the diameter of which is left to the manufacturer's discretion.

6) No torsion ratio (i.e. ratio of the pin torsion to the box torsion) below 0,80 is indicated.

In some cases, tool joints with noticeably smaller torsion values may be suitable.

7) The length of the male thread is reduced to 88,9 mm (reduction by 12,7 mm) to take account of the internal diameter of 76,2 mm.

8) "Old" connection.

* Standard inside or outside diameter.

1) To be defined on the order between purchaser and manufacturer.

TABLE 1 — **Dimensions, in millimetres, of tool joints for steel drill pipes of grades E, X, G and S**

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Designation of tool joint[1]	Dimension and style[2]	Mass per unit length of drill pipes[3] kg/m	Grade	Outside diameters, pin and box D ± 0,8	Inside diameter, pin[5] d + 0,4 − 0,8	Diameter of shoulder chamfer, pin or box D_F ± 0,4	Total length of pin L_P + 6,4 − 9,5	Place for spanner on pin L_{PB} ± 6,4	Place for spanner on box L_B ± 6,4	Combined length of pin and box L ± 12,7	Diameter of pin at upset of elevator[4] D_{PE} max.	Diameter of box at upset[4] D_{TE} max.	Ratio of pin to box for torsion[6]
NC 26 (60,3 IF) (2,375 IF)	60,3 E.U.	9,90	E 52	85,7*	44,5*	83,0	228,6	152,4	177,8	330,2	65,1	65,1	1,10
		6,65	X 66	85,7*	44,5*	83,0	228,6	152,4	177,8	330,2	65,1	65,1	0,87
			G 73	85,7*	44,5*	83,0	228,6	152,4	177,8	330,2	65,1	65,1	0,79
NC 31 (73,0 IF) (2,875 IF)	73,0 E.U.	15,50	E 52	104,8*	54,0*	100,4	241,3	152,4	203,2	355,6	81,0	80,1	1,03
		10,40	X 66	104,8*	50,8	100,4	241,3	152,4	203,2	355,6	81,0	80,1	0,90
			G 73	104,8*	50,8	100,4	241,3	152,4	203,2	355,6	81,0	80,1	0,82
			S 93	111,0	41,3	100,4	241,3	152,4	203,2	355,6	81,0	80,1	0,82
NC 38[7]	88,9 E.U.	14,1	E 52	120,7*	76,2	116,3	266,7	177,8	241,3	419,1	98,4	98,4	0,91
		9,50											
NC 38 (88,9 IF) (3,500 IF)	88,9 E.U.	19,8	E 52	120,7	68,3	116,3	279,4	177,8	241,3	419,1	98,4	98,4	0,98
		13,30	X 66	127,0	65,1	116,3	279,4	177,8	241,3	419,1	98,4	98,4	0,87
			G 73	127,0	61,9	116,3	279,4	177,8	241,3	419,1	98,4	98,4	0,86
			S 93	127,0	54,0	116,3	279,4	177,8	241,3	419,1	98,4	98,4	0,80
		23,1	E 52	127,0	65,1	116,3	279,4	177,8	241,3	419,1	98,4	98,4	0,97
		15,50	X 66	127,0	61,9	116,3	279,4	177,8	241,3	419,1	98,4	98,4	0,83
			G 73	127,0	54,0	116,3	279,4	177,8	241,3	419,1	98,4	98,4	0,90
NC 40 (101,6 FH) (4,000 FH)	88,9 E.U.	23,1	S 93	139,7	57,2	127,4	292,1	177,8	254,0	431,8	98,4	98,4	0,87
		15,50											
	101,6 I.U.	20,8	E 52	133,4*	71,5*	127,4	292,1	177,8	254,0	431,8	106,4	106,4	1,01
		14,0	X 66	133,4*	68,3	127,4	292,1	177,8	254,0	431,8	106,4	106,4	0,86
			G 73	139,7	61,9	127,4	292,1	177,8	254,0	431,8	106,4	106,4	0,93
			S 93	139,7	50,8	127,4	292,1	177,8	254,0	431,8	106,4	106,4	0,86
NC 46 (101,6 IF) (4,000 IF)	101,6 E.U.	20,8	E 52	152,4*	82,6*	145,3	292,1	177,8	254,0	431,8	114,3	114,3	1,43
		14,0	X 66	152,4*	82,6*	145,3	292,1	177,8	254,0	431,8	114,3	114,3	1,13
			G 73	152,4*	82,6*	145,3	292,1	177,8	254,0	431,8	114,3	114,3	1,02
			S 93	152,4*	76,2	145,3	292,1	177,8	254,0	431,8	114,3	114,3	0,94
	114,3 I.E.U.	24,7	E 52	158,8	82,6*	145,3	292,1	177,8	254,0	431,8	119,1	119,1	1,09
	4,500 I.E.U.	16,60	X 66	158,8	76,2	145,3	292,1	177,8	254,0	431,8	119,1	119,1	1,01
			G 73	158,8	76,2	145,3	292,1	177,8	254,0	431,8	119,1	119,1	0,91
			S 93	158,8	69,9	145,3	292,1	177,8	254,0	431,8	119,1	119,1	0,81
	114,3 I.E.U.	29,8	E 52	158,8	76,2	145,3	292,1	177,8	254,0	431,8	119,1	119,1	1,07
	4,500 I.E.U.	20,00	X 66	158,8	69,9	145,3	292,1	177,8	254,0	431,8	119,1	119,1	0,96
			G 73	158,8	63,5	145,3	292,1	177,8	254,0	431,8	119,1	119,1	0,96
			S 93	158,8	57,2	145,3	292,1	177,8	254,0	431,8	119,1	119,1	0,81
4 1/2 FH[8]	114,3 I.E.U.	24,7	E 52	152,4*	76,2*	145,3	279,4	177,8	254,0	431,8	119,1	119,1	1,12
	4,500 I.E.U.	16,60	X 66	152,4*	76,2	145,3	279,4	177,8	254,0	431,8	119,1	119,1	0,89
			G 73	152,4*	76,2	145,3	279,4	177,8	254,0	431,8	119,1	119,1	0,81
			S 93	158,8	63,5	145,3	279,4	177,8	254,0	431,8	119,1	119,1	0,81
	114,3 I.E.U.	29,8	E 52	152,4*	76,2*	145,3	279,4	177,8	254,0	431,8	119,1	119,1	0,95
	4,500 I.E.U.	20,00	E 52	152,4*	63,5	145,3	279,4	177,8	254,0	431,8	119,1	119,1	0,95
			G 73	152,4*	63,5	145,3	279,4	177,8	254,0	431,8	119,1	119,1	0,86
NC 50 (114,3 IF) (4,500 IF)	114,3 E.U.	24,7	E 52	161,9*	95,3	150,4	292,1	177,8	254,0	431,8	127,0	127,0	1,23
	4,500 E.U.	16,60	X 66	161,9*	95,3	150,4	292,1	177,8	254,0	431,8	127,0	127,0	0,97
			E 52	161,9*	95,3	150,4	292,1	177,8	254,0	431,8	127,0	127,0	0,88
			S 93	161,9*	88,9	150,4	292,1	177,8	254,0	431,8	127,0	127,0	0,81
	114,3 E.U.	29,8	E 52	161,9*	92,1	150,4	292,1	177,8	254,0	431,8	127,0	127,0	1,02
	4,500 E.U.	20,00	X 66	161,9*	88,9	150,4	292,1	177,8	254,0	431,8	127,0	127,0	0,96
			G 73	161,9*	88,9	150,4	292,1	177,8	254,0	431,8	127,0	127,0	0,86
			S 93	168,3	76,2	150,4	292,1	177,8	254,0	431,8	127,0	127,0	0,87
	127 I.E.U.	29,0	E 52	161,9*	95,3*	150,4	292,1	177,8	254,0	431,8	130,2	130,2	0,92
	5,00 I.E.U.	19,50	X 66	161,9*	88,9	150,4	292,1	177,8	254,0	431,8	130,2	130,2	0,86
			G 73	165,1	82,6	150,4	292,1	177,8	254,0	431,8	130,2	130,2	0,89
			S 93	168,3	69,9	150,4	292,1	177,8	254,0	431,8	130,2	130,2	0,86
	127 I.E.U.	38,1	E 52	161,9*	88,9	150,4	292,1	177,8	254,0	431,8	130,2	130,2	0,86
	5,00 I.E.U.	25,60	X 66	165,1	76,2	150,4	292,1	177,8	254,0	431,8	130,2	130,2	0,86
			G 73	168,3	69,9	150,4	292,1	177,8	254,0	431,8	130,2	130,2	0,87
5 1/2 FH[8]	127 I.E.U.	29,0	E 52	177,8*	95,3	170,7	330,2	203,2	254,0	457,2	130,2	130,2	1,53
	5,00 I.E.U.	19,50	X 66	177,8*	95,3	170,7	330,2	203,2	254,0	457,2	130,2	130,2	1,21
			G 73	177,8*	95,3	170,7	330,2	203,2	254,0	457,2	130,2	130,2	1,09
			S 93	184,2	88,9	170,7	330,2	203,2	254,0	457,2	130,2	130,2	0,98
	127 I.E.U.	38,1	E 52	177,8*	88,9	170,7	330,2	203,2	254,0	457,2	130,2	130,2	1,21
	5,00 I.E.U.	25,60	X 66	177,8*	88,9	170,7	330,2	203,2	254,0	457,2	130,2	130,2	0,95
			G 73	184,2	88,9	170,7	330,2	203,2	254,0	457,2	130,2	130,2	0,99
			S 93	184,2	82,3	170,7	330,2	203,2	254,0	457,2	130,2	130,2	0,83
	139,7 I.E.U.	32,6	E 52	177,8*	101,6	170,7	330,2	203,2	254,0	457,2	144,5	144,5	1,11
	5,500 I.E.U.	21,90	X 66	177,8*	95,3	170,7	330,2	203,2	254,0	457,2	144,5	144,5	0,98
			G 73	184,2	88,9	170,7	330,2	203,2	254,0	457,2	144,5	144,5	1,02
			S 93	190,5	76,2	180,2	330,2	203,2	254,0	457,2	144,5	144,5	0,96
	139,7 I.E.U.	36,8	E 52	177,8*	101,6	170,7	330,2	203,2	254,0	457,2	144,5	144,5	0,99
	5,500 I.E.U.	24,70	X 66	184,2	88,9	170,7	330,2	203,2	254,0	457,2	144,5	144,5	1,01
			G 73	184,2	88,9	170,7	330,2	203,2	254,0	457,2	144,5	144,5	0,92
			S 93	190,5	76,2	180,2	330,2	203,2	254,0	457,2	144,5	144,5	0,86

5 TOOL JOINTS FOR DRILL PIPES OF DIAMETER ⩾ 60,3 mm

5.1 Mechanical requirements

5.1.1 *Steel*

Tool joints shall be manufactured from a steel such as to achieve, after appropriate heat treatment and final machining, the following mechanical properties :

TABLE 2 – **Mechanical properties for steel tool joints**

Proof stress, R_p N/mm²	**Minimum tensile strength, R_m** N/mm²	**Minimum elongation** %
825	965	13

To check this requirement, a Brinell test may be used. However, application of a Brinell test is left to the choice of the manufacturer, provided that the latter is able to supply the purchaser's representative with a justification based on adequate correlations with tensile test pieces.

In case of dispute on the minimum Brinell hardness values chosen by the manufacturer, destructive testing shall take place on tensile test pieces taken as indicated in 5.1.4.

5.1.2 *External surface condition*

Several processes may be specified by agreement between the purchaser and the manufacturer to harden the outside surface of the box of tool joints in order to improve wear-resistance. Different processes of hardening may be used, in particular by application of tungsten carbide; however, none of these processes shall imply covering or modification of the base metal close to the shoulders.

5.1.3 *Anti-sticking treatment of the threaded connection*

All rotary shouldered connections (except for fishtail bits) shall be heat treated or treated by any other suitable method of manufacture, in order to minimize the chance of galling. No methods of treatment are specified, since this is dependent on the chemical and physical properties of the materials used. The process to be used shall not allow hydrogen inclusions, which embrittle steel.

5.1.4 *Mechanical tests*

– Brinell hardness test :

On each pin and box close to the thrust shoulder.

– Tensile test piece

By agreement between purchaser and manufacturer, either on the finished tool joint or on a rough tool joint, just after complete heat treatment, or on a "pseudo tool joint" wrought in a way representing normal manufacture, or else on finished tool joints the hardness of which is closest to the minimum declared by the manufacturer.

5.2 Threads

5.2.1 *Size and style*

Rotary shouldered connections shall be furnished in the sizes and styles shown in table 3, as specified below for the particular drill stem member, or, if not specified below, as specified on the purchase order.

5.2.2 *Dimensions*

Dimensions of these rotary shouldered connections shall conform to figures 2 and 3 and to tables 3 and 4. All shoulder contact faces shall be square with the thread axis and flat within 0,05 mm (0.002 in). Threads shall be controlled by specified reference master gauges. The thread axes of drill stem members, except bits, shall not deviate from the design axis of the product by an angle greater than 0° 3′ 35″ (1 mm per metre of projected axis). The design axis shall be assumed as intersecting the thread axis at the plane of the joint shoulder.

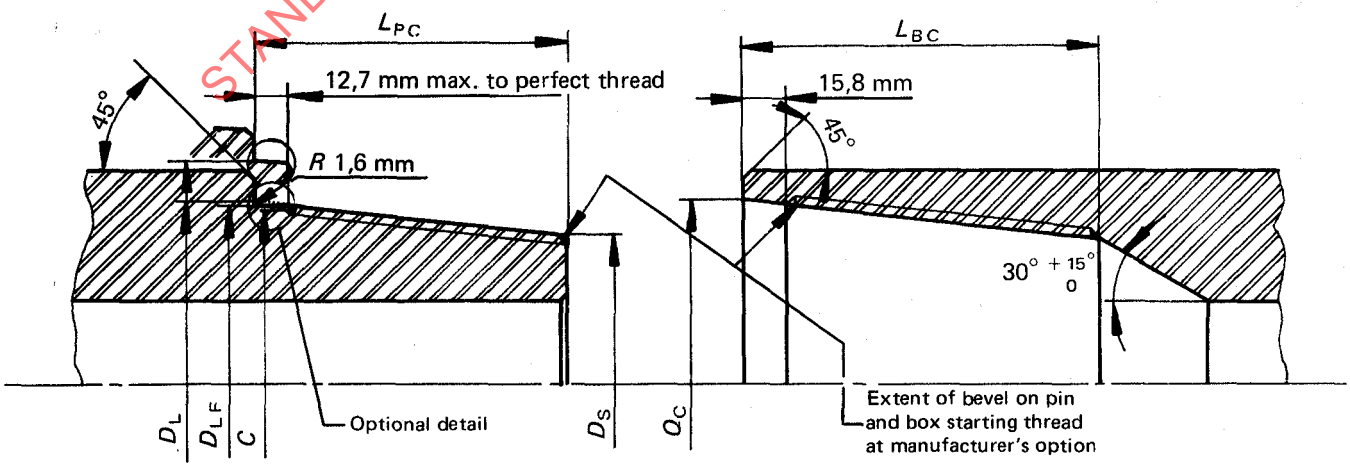


FIGURE 2 – **Connecting thread**

TABLE 3 – **Dimensions of rotary shouldered connections, in millimetres**

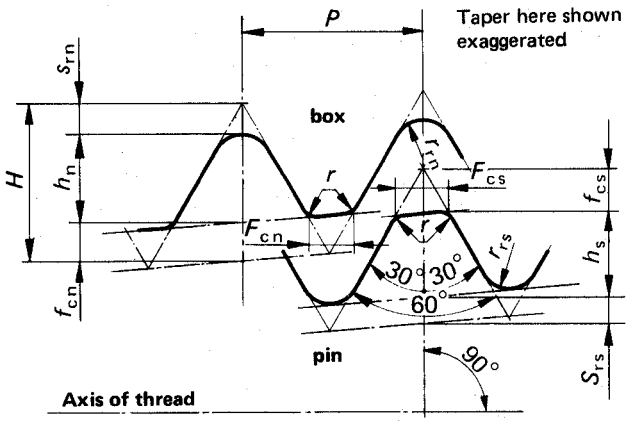
1	2	3		4	5	6	7	8	9	10	11
Connection No.	**Thread form**	**Pitch**	**Threads per 25,4 mm**	**Taper on diameter** %	**Gauge diameter** C	**Large diameter of pin** D_L	**Diameter of flat on pin**[2] D_{LF} ± 0,40	**Small diameter of pin** D_S	**Length of pin** L_{PC} 0 − 3,18	**Depth of box**[3] L_{BC} + 9,52 0	**Box counter-bore** Q_C + 0,79 − 0,40
Numbered style (NC)[1]											
NC 26	V-0.038 R	6,35	4	16,66	67,767	73,1	69,8	60,4	76,2	92,1	74,6
NC 31	V-0.038 R	6,35	4	16,66	80,848	86,1	83,0	71,3	88,9	104,8	87,7
NC 38	V-0.038 R	6,35	4	16,66	96,723	102,0	98,8	85,1	101,6	117,5	103,6
NC 40	V-0.038 R	6,35	4	16,66	103,429	108,7	105,6	89,7	114,3	130,2	110,3
NC 46	V-0.038 R	6,35	4	16,66	117,500	122,8	119,6	103,7	114,3	130,2	124,6
NC 50	V-0.038 R	6,35	4	16,66	128,059	133,4	130,4	114,3	114,3	130,2	134,9
NC 56	V-0.038 R	6,35	4	25,00	142,646	149,3	144,9	117,5	127,0	142,9	150,8
Regular style (REG)											
60,3 REG	V-0.040	5,08	5	25,00	60,080	66,7	–	47,6	76,2	92,1	68,3
73,0 REG	V-0.040	5,08	5	25,00	69,605	76,2	–	54,0	88,9	104,8	77,8
88,9 REG	V-0.040	5,08	5	25,00	82,293	88,9	–	65,1	95,2	111,1	90,5
114,3 REG	V-0.040	5,08	5	25,00	110,868	117,5	–	90,5	108,0	123,8	119,1
139,7 REG	V-0.050	6,35	4	25,00	132,944	140,2	–	110,1	120,6	136,5	141,7
OBSOLESCENT PRODUCT DIMENSIONS											
Full-hole style (FH)											
88,9 FH	V-0.040	5,08	5	25,0	94,844	101,4	–	77,6	95,2	111,1	102,8
101,6 FH	V-0.065	6,35	4	16,66	103,429	108,7	105,6	89,7	114,3	130,2	110,3
114,3 FH	V-0.040	5,08	5	25,00	115,113	121,7	–	96,3	101,6	117,5	123,8
139,7 FH	V-0.050	6,35	4	16,66	142,011	148,0	–	126,8	127,0	142,9	150,0
Internal-flush style (IF)											
60,3 IF	V-0.065	6,35	4	16,66	67,767	73,1	69,8	60,4	76,2	92,1	74,6
73,0 IF	V-0.065	6,35	4	16,66	80,848	86,1	83,0	71,3	88,9	104,8	87,7
88,9 IF	V-0.065	6,35	4	16,66	96,723	102,0	98,8	85,1	101,6	117,5	103,6
101,6 IF	V-0.065	6,35	4	16,66	117,500	122,8	119,6	103,7	114,3	130,2	124,6
114,3 IF	V-0.065	6,35	4	16,66	128,059	133,4	130,4	114,3	114,3	130,2	134,9
139,7 IF	V-0.065	6,35	4	16,66	157,201	162,5	–	141,3	127,0	142,9	163,9

1) The number of the connection in the numbered style (NC) is the quotient of the gauge diameter of the pin thread in millimetres (at gauge point) and 2,54 (or 10 times the gauge diameter in inches), rounded to two figures.

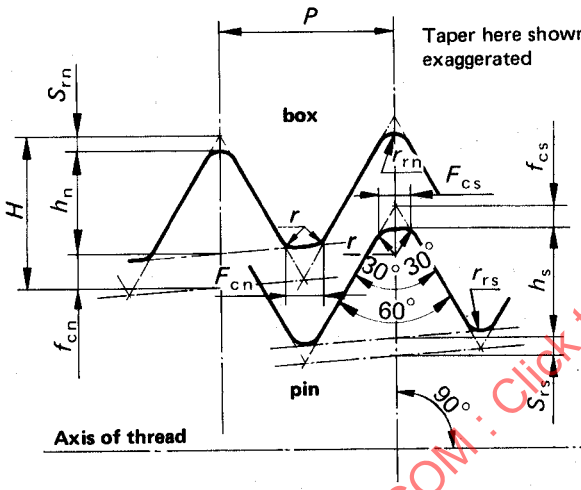
These connections, up to NC 50, are interchangeable with the connections having the same gauge diameter of the types FH and IF (see table 5).

2) The diameter D_{LF} and radius 1,6 mm (0.062 in) at the base of the pin (see figure 2) are standard for taper-threaded drill collars and are at the discretion of the manufacturer for the other drill stem elements.

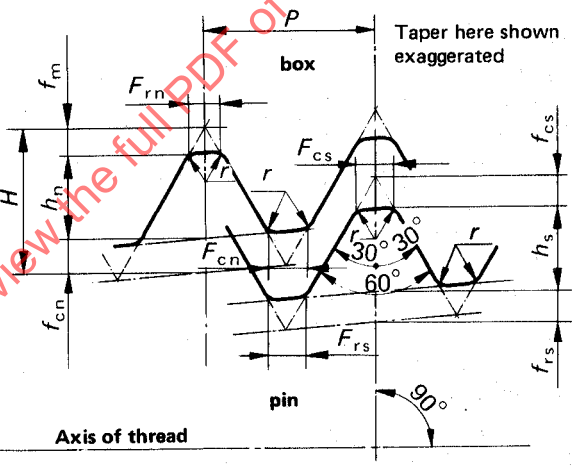
3) The length of a complete female thread shall be not less than the maximum length of a male thread plus 3,2 mm.



a) V-0.038 R product thread form



b) V-0.040 and V-0.050 product thread form



c) V-0.065 product thread form

(Obsolescent — To be removed at a later date)

FIGURE 3 — **Types of thread**

TABLE 4 — **Thread dimensions of connections, in millimetres**

1	2		3	4	5	6	7	8	9	10
Form of thread	Taper		Thread height, not truncated	Thread height, truncated	Root truncation	Crest truncation	Width of flat		Root radius	Radius at thread corners
	% on D	inches per foot	H	$h_n = h_s$	$S_{rn} = S_{rs}$ $f_{rn} = f_{rs}$	$f_{cn} = f_{cs}$	Crest $F_{cn} = F_{cs}$	Root $F_{rn} = F_{rs}$	$r_{rn} = r_{rs}$	r
V-0.038 R	16,66	2	5,486	3,095	0,965	1,426	1,651	–	0,965	0,381
V-0.038 R	25,00	3	5,471	3,083	0,965	1,422	1,651	–	0,965	0,381
V-0.040	25,00	3	4,376	2,993	0,508	0,875	1,016	–	0,508	0,381
V-0.050	25,00	3	5,471	3,741	0,635	1,094	1,270	–	0,635	0,381
V-0.050	16,66	2	5,486	3,754	0,635	1,097	1,270	–	0,635	0,381
V-0.065	16,66	2	5,486	2,831	1,229	1,426	1,651	1,422	–	0,381

5.2.3 *Tolerances*

The following tolerances shall apply to the lead and taper of rotary shouldered connections, except when such connections are used on bits. The dimensions of other thread elements for rotary shouldered connections are given without tolerances and are not subject to inspection by direct measurement (see tables 3 and 4).

5.2.3.1 LEAD TOLERANCE

— On a short base :

equal to the number of complete threads : ± 0,04 mm (see column 3 of table 3).

— On total thread length : L_{PC} or L_{BC}

between first and last complete thread : ± 0,11 mm

or, if this sum is greater than 0,11 mm : $\pm \frac{L_{PC}}{1\,000}$ mm or $\pm \frac{L_{BC}}{1\,000}$ mm.

NOTE — The lead tolerance on a short base is the maximum allowable error for any distance within the thread number (see column 3 of table 3) over the total thread length.

5.2.3.2 TAPER TOLERANCE ON DIAMETER

Male (pin) thread : $^{+\,0,25}_{0}$ %

Female (box) thread : $^{0}_{-\,0,25}$ %

Taper tolerances apply to the average taper within the total thread length.

5.2.3.3 TOLERANCE ON THREAD GAUGING DIAMETER (see column 5 of table 3)

The gauging diameter shall be checked by means of male and female thread gauges according to the procedure given in ISO . . .[1] which specifies the requirements for certification of the gauges.

5.3 Interchangeability of thread forms

The thread form for numbered style rotary shouldered connections (V-0.038 R), as shown in figure 3a), is interchangeable with the V-0.065 flat form shown in figure 3c). The V-0.038 R form may be substituted, at the option of the manufacturer, for the V-0.065 flat form on any size of IF connections, or any 101,6 (4 in) FH connection.

5.4 Interchangeability of shouldered connections

Certain dimensions of numbered style shouldered connections are interchangeable with connections of other styles of table 3. They differ only in the threading form, and since the forms are interchangeable, the connections are interchangeable. These interchangeable shouldered connections are shown in table 5.

TABLE 5 — **Interchangeable shouldered connections**

Numbered style connection	Equivalent connection of table 3
NC 26	60,3 IF (2 3/8 IF)
NC 31	73 IF (2 7/8 IF)
NC 38	88,9 IF (3 1/2 IF)
NC 40	101,6 FH (4 FH)
NC 46	101,6 IF (4 IF)
NC 50	114,3 IF (4 1/2 IF)

6 TOOL JOINTS FOR DRILL PIPES OF DIAMETER < 60,3 mm

The following specifications applying to work strings are given for information only. The details concerning weld-on tool joint gauges, etc., are being developed.

6.1 Dimensions

See figure 5 and table 6.

6.2 Material requirements

The sub-clauses on steel (5.1.1),

treatment of threaded connection (5.1.3), and

mechanical tests (5.1.4)

may be guaranteed after agreement between the manufacturer and the purchaser.

6.3 Threads

Dimensions : See figure 5 and table 7.

6.4 "O"-ring

Dimensions : See figure 6 and table 8.

1) In preparation.

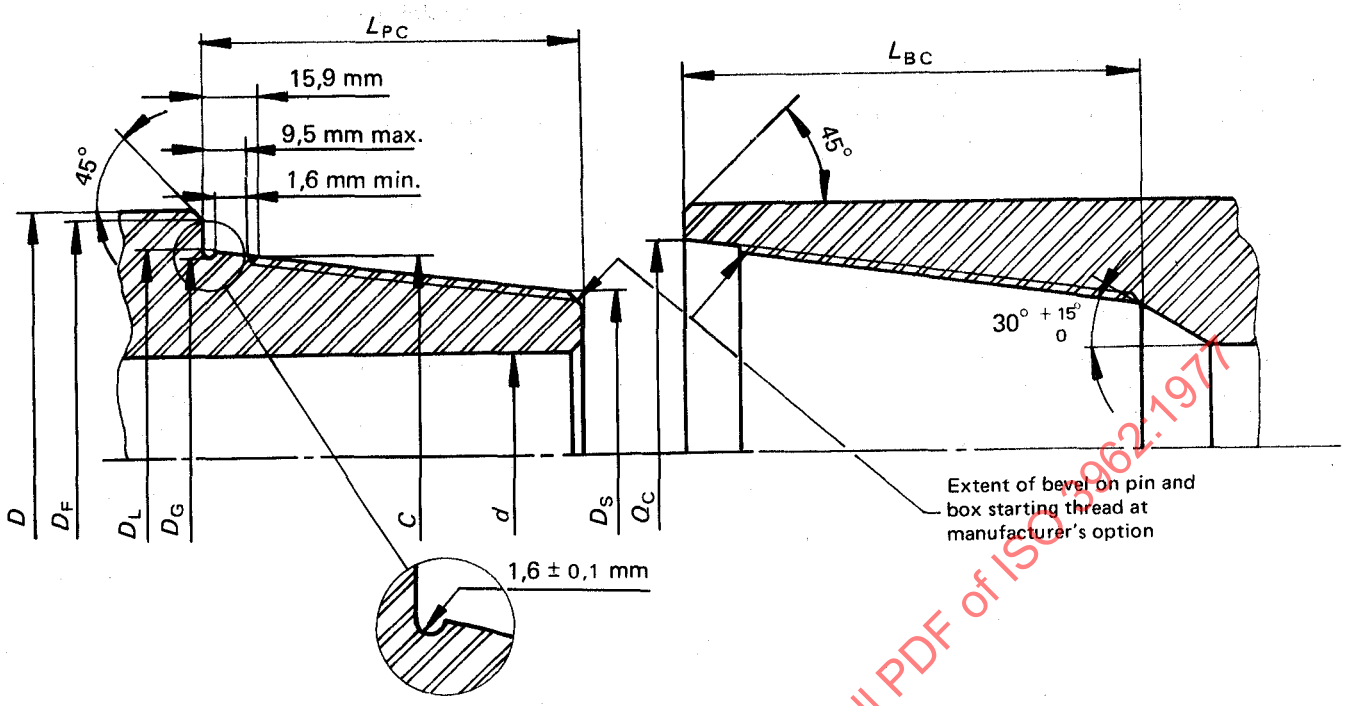


FIGURE 4 — **Thread connection**

TABLE 6 — **Dimensions of connection in millimetres**

1	2	3	4	5	6	7	8	9	10	11
Connection No.	**Outside diameter of pin and box** D ± 0,25	**Inside diameter of pin and box** d + 0,13 − 0,25	**Bevel diameter** D_F ± 0,13	**Gauge diameter of thread at gauging point** C	**Largest reference diameter of pin** D_L	**Diameter of "O"-ring groove** D_G + 0,13 0	**Smallest diameter of pin** D_S	**Length of pin** L_{PC} 0 − 3,2	**Profile of box** L_{BC} + 9,5 0	**Counter-bore of box** Q_C ± 0,13
NC 10	34,9	18,3	34,1	27,000	30,2	26,5	25,5	38,1	54,0	30,6
NC 12	41,3	23,0	39,7	32,131	35,4	31,6	29,8	44,4	60,3	35,7
NC 13	46,0	23,8	44,4	35,331	38,6	34,8	33,0	44,4	60,3	38,9
NC 16	54,0	25,4	52,4	40,869	44,1	40,4	38,5	44,4	60,3	44,5

NOTE — "O"-ring optional for high-pressure use. See table 8 for "O"-ring dimensions. The length of perfect threads in the box shall be not less than the maximum pin length (L_{PC}) plus 3,2 mm.

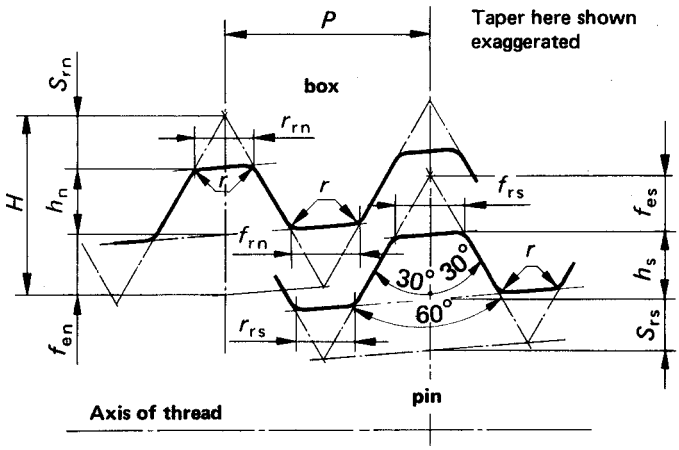


FIGURE 5 – **Thread form V-0.055**

TABLE 7 – **Dimensions of thread connection, in millimetres**

1	2		3	4	5	6	7	8	9	10
Thread form	**Taper**		**Pitch**	**Thread height, not truncated**	**Thread height, truncated**	**Root truncation**	**Crest truncation**	**Width of flat crest**	**Width of root of flat thread**	**Radius at thread corners**
	% **on *D***	**inches per foot**		***H***	$h_n = h_s$	$S_{rn} = S_{rs}$ $f_{rn} = f_{rs}$	$f_{en} = f_{es}$	$f_{rn} = f_{rs}$	$r_{rn} = r_{rs}$	***r***
V-0.055	12,5	1,5	4,23	3,660	1,420	1,031	1,209	1,397	1,194	0,381