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Rotary drilling equipment – Upper and lower kelly cocks

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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 2290 was drawn up by Technical Committee ISO/TC 67, *Materials and equipment for petroleum and natural gas industries*.

It was approved in June 1971 by the Member Bodies of the following countries :

Austria	Hungary	Romania
Czechoslovakia	India	Spain
Egypt, Arab Rep. of	Japan	United Kingdom
France	Netherlands	U.S.A.
Germany	New Zealand	U.S.S.R.
Greece	Poland	

No Member Body expressed disapproval of the document.

Rotary drilling equipment – Upper and lower kelly cocks

1 SCOPE AND FIELD OF APPLICATION

This International Standard lays down specifications for kelly cocks. These are manually operated valves in the circulating system of the drill stem, intended for use in blow-out emergencies.

The upper kelly cock is intended for use between the lower end of the swivel sub and the upper end of the kelly (Figure 1).

The lower kelly cock is intended for use between the lower end of the kelly and the upper end of the drill pipe or the upper end of the kelly saver sub (Figure 1).

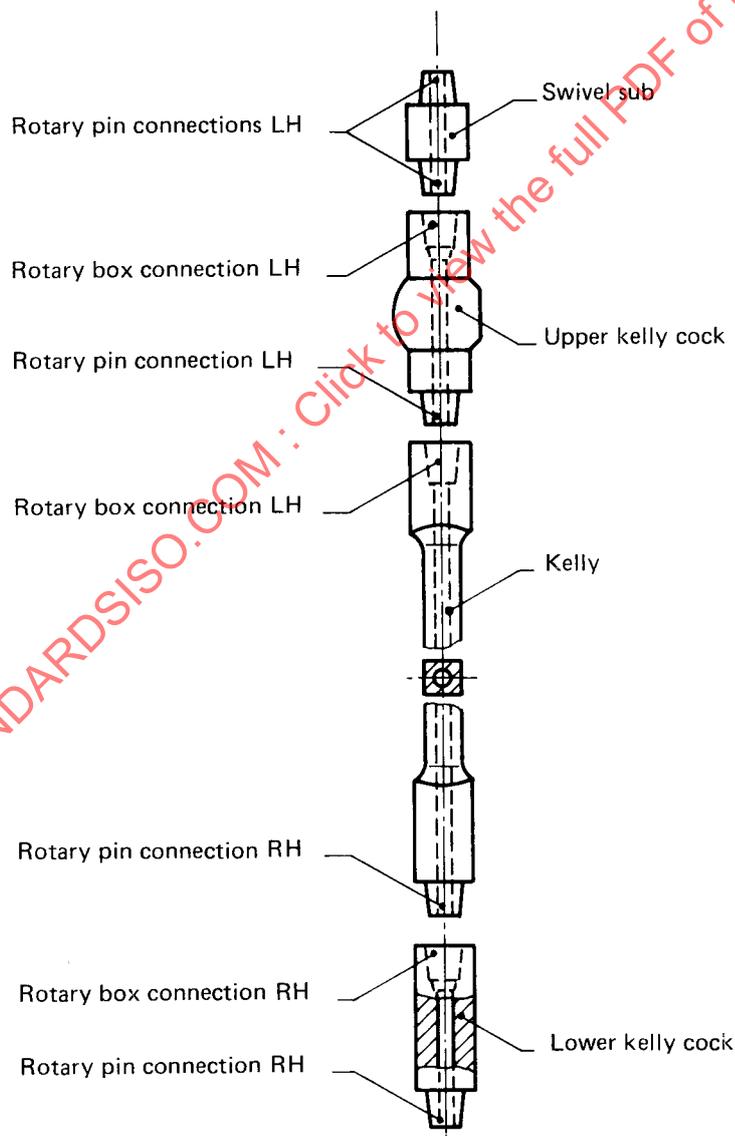


FIGURE 1 – Kelly and kelly cocks assembly

2 SYMBOLS AND ABBREVIATIONS

- REG = Regular
- FH = Full Hole
- IF = Internal Flush
- LH = Left-Hand
- RH = Right-Hand
- Std = Standard
- Opt = Optional

3 MANUFACTURE

3.1 Upper and lower kelly cocks shall be furnished as specified in the purchase order, for either square or hexagonal kellys, and in the sizes shown in Tables 1, 2, 3 and 4.

3.2 Connections

3.2.1 Upper and lower kelly cocks shall be furnished with box up and pin down rotary shouldered connections, in the size and style shown in Tables 1, 2, 3 and 4.

3.2.2 Upper kelly cocks shall be furnished with left-hand connections. Lower kelly cocks shall be furnished with right-hand connections.

3.2.3 The threads shall be treated by some suitable method of manufacture to minimize galling and corrosion damage.

3.3 Shape

3.3.1 The shape of the upper and lower kelly cock shall be at the discretion of the manufacturer.

3.3.2 The kelly cock body shall be completely streamlined, with no protruding parts liable to cause an accident.

3.4 Dimensions

3.4.1 The dimensions of upper kelly cocks shall conform to the dimensions shown in Tables 1 and 2 and in Figure 2.

3.4.2 The dimensions of lower kelly cocks shall conform to the dimensions shown in Tables 3 and 4.

3.4.3 The outside diameter of the upper kelly cock shall suit the manufacturer's design requirements. This International Standard in no way restricts the manufacturer from increasing the outside diameter of the upper kelly cock body.

3.4.4 The outside diameter of the lower kelly cock should be as large as operations in the well permit.

The strength in torsion and in tension of the lower kelly cock should be at least as great as the respective strengths of the tool joints used in the string.

3.4.5 A tong space of at least 200 mm (8 in) length shall be provided on the box connection of the upper kelly cock (Figure 2).

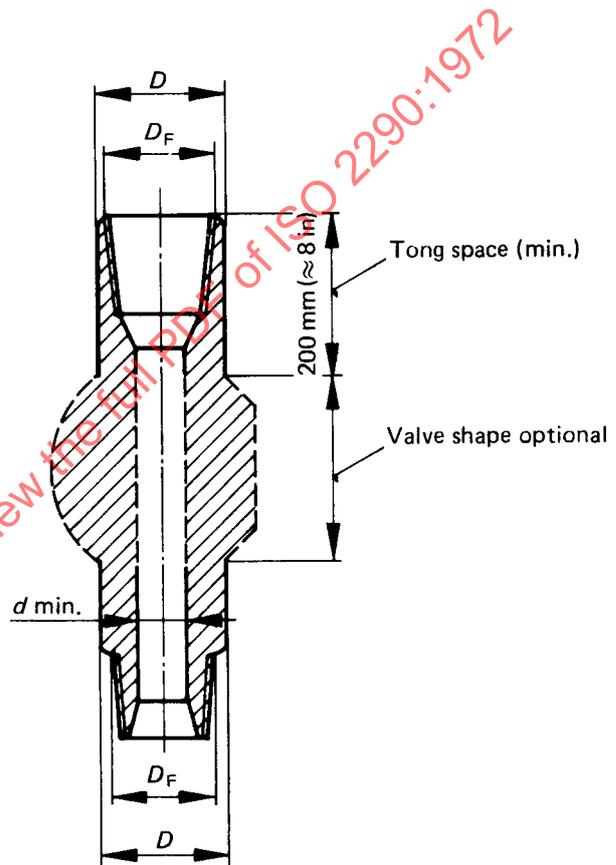


FIGURE 2 — Upper kelly cock

3.4.6 Lower kelly cocks shall be furnished in lengths sufficient to provide a minimum tong space of 200 mm (8 in) after the box and pin connections have been recut at least once.

TABLE 1 – Upper kelly cocks for square kellys

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Kelly size		Upper box and lower pin connections Size and style LH		Outside diameter <i>D</i>				Bore <i>d</i> , minimum, at maximum working pressure								Bevel diameter <i>D_F</i>			
				± 6.35 mm (± 1/4 in)		± 0.8 mm (± 1/32 in)		350 bar (5 000 lbf/in ²)				700 and 1 050 bar (10 000 and 15 000 lbf/in ²)				± 0.4 mm (± 1/64 in)			
		Std	Opt	Std		Opt		Std con.		Opt con.		Std con.		Opt con.		Std		Opt	
mm	in	in	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
63.5	2 1/2	6 5/8 REG	4 1/2 REG	200.0	7 7/8	146.0	5 3/4	76.2	3	50.8	2	63.5	2 1/2	44.4	1 3/4	186.1	7 21/64	134.5	5 19/64
76.2	3	6 5/8 REG	4 1/2 REG	200.0	7 7/8	146.0	5 3/4	76.2	3	50.8	2	63.5	2 1/2	44.4	1 3/4	186.1	7 21/64	134.5	5 19/64
88.9	3 1/2	6 5/8 REG	4 1/2 REG	200.0	7 7/8	146.0	5 3/4	76.2	3	50.8	2	63.5	2 1/2	44.4	1 3/4	186.1	7 21/64	134.5	5 19/64
108.0	4 1/4	6 5/8 REG	4 1/2 REG	200.0	7 7/8	146.0	5 3/4	76.2	3	50.8	2	63.5	2 1/2	44.4	1 3/4	186.1	7 21/64	134.5	5 19/64
133.4	5 1/4	6 5/8 REG	—	200.0	7 7/8	—	—	76.2	3	—	—	63.5	2 1/2	—	—	186.1	7 21/64	—	—
140.0	5 1/2	6 5/8 REG	—	200.0	7 7/8	—	—	76.2	3	—	—	63.5	2 1/2	—	—	186.1	7 21/64	—	—
152.4	6	6 5/8 REG	—	200.0	7 7/8	—	—	76.2	3	—	—	63.5	2 1/2	—	—	186.1	7 21/64	—	—

TABLE 2 – Upper kelly cocks for hexagonal kellys

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Kelly size		Upper box and lower pin connections Size and style LH		Outside diameter <i>D</i>				Bore <i>d</i> , minimum, at minimum working pressure								Bevel diameter <i>D_F</i>			
				± 6.35 mm (± 1/4 in)		± 0.8 mm (± 1/32 in)		350 bar (5 000 lbf/in ²)				700 and 1 050 bar (10 000 and 15 000 lbf/in ²)				± 0.4 mm (± 1/64 in)			
		Std	Opt	Std		Opt		Std con.		Opt con.		Std con.		Opt con.		Std		Opt	
mm	in	in	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
76.2	3	6 5/8 REG	4 1/2 REG	200.0	7 7/8	146.0	5 3/4	76.2	3	50.8	2	63.5	2 1/2	44.4	1 3/4	186.1	7 21/64	134.5	5 19/64
88.9	3 1/2	6 5/8 REG	4 1/2 REG	200.0	7 7/8	146.0	5 3/4	76.2	3	50.8	2	63.5	2 1/2	44.4	1 3/4	186.1	7 21/64	134.5	5 19/64
108.0	4 1/4	6 5/8 REG	4 1/2 REG	200.0	7 7/8	146.0	5 3/4	76.2	3	50.8	2	63.5	2 1/2	44.4	1 3/4	186.1	7 21/64	134.5	5 19/64
133.4	5 1/4	6 5/8 REG	—	200.0	7 7/8	—	—	76.2	3	—	—	63.5	2 1/2	—	—	186.1	7 21/64	—	—
152.4	6	6 5/8 REG	—	200.0	7 7/8	—	—	76.2	3	—	—	63.5	2 1/2	—	—	186.1	7 21/64	—	—

TABLE 3 — Lower kelly cocks for square kellys and for 350 bar maximum pressure rating

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Kelly size		Upper box and lower pin connections Size and style RH	Bore + 0.4 mm - 0.8 mm ($\pm 1/64$ in) ($-1/32$ in)		Bevel diameter ± 0.4 mm ($\pm 1/64$ in)	
mm	in	in	mm	in	mm	in
63.5	2 1/2	2 3/8 IF	31.8	1 1/4	82.6	3 1/4
76.2	3	2 7/8 IF	44.4	1 3/4	100.4	3 61/64
88.9	3 1/2	3 1/2 IF	57.2	2 1/4	116.3	4 37/64
108.0	4 1/4	4 IF	71.4	2 13/16	140.5	5 17/32
108.0	4 1/4	4 1/2 IF	71.4	2 13/16	150.4	5 59/64
133.4	5 1/4	5 1/2 FH	82.6	3 1/4	170.7	6 23/32
140.0	5 1/2	5 1/2 FH	82.6	3 1/4	170.7	6 23/32
152.4	6	6 5/8 FH	88.9	3 1/2	170.7	6 23/32

TABLE 4 — Lower kelly cocks for hexagonal kellys and for 350 bar maximum pressure rating

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Kelly size		Upper box and lower pin connections Size and style RH	Bore + 0.4 mm - 0.8 mm ($\pm 1/64$ in) ($-1/32$ in)		Bevel diameter ± 0.4 mm ($\pm 1/64$ in)	
mm	in	in	mm	in	mm	in
76.2	3	2 3/8 IF	38.0	1 1/2	82.6	3 1/4
88.9	3 1/2	2 7/8 IF	44.4	1 3/4	100.4	3 61/64
108.0	4 1/4	3 1/2 IF	57.2	2 1/4	116.3	4 37/64
133.4	5 1/4	4 IF	76.2	3	140.5	5 17/32
133.4	5 1/4	4 1/2 IF	82.6	3 1/4	150.4	5 59/64
152.4	6	5 1/2 FH	88.9	3 1/2	170.7	6 23/32

4 REQUIRED CHARACTERISTICS

4.1 Pressure rating

4.1.1 Upper kelly cocks shall be furnished in the maximum working pressure ratings specified in Table 5.

TABLE 5 — Working and hydrostatic test pressure rating

Maximum working pressure rating		Hydrostatic shell test pressure	
bar	lbf/in ²	bar	lbf/in ²
350	5 000	700	10 000
700	10 000	1 050	15 000
1 050	15 000	1 575	22 500

The purchase order shall specify the maximum working rating of the kelly cocks.

4.1.2 Lower kelly cocks shall be furnished with 350 bar maximum working pressure rating.

Designs for higher working pressures shall be agreed upon between user and manufacturer, and so specified on the purchase order.

4.2 Working temperature

The maximum working temperature rating for upper and lower kelly cocks shall be 82 °C (180 °F).

5 TEST METHODS

5.1 Upper kelly cocks shall be subjected to a hydrostatic test pressure as shown in Table 5.

5.2 Lower kelly cocks shall be subjected to a 700 bar hydrostatic shell test pressure.

Higher test pressures for lower kelly cocks shall be agreed upon between user and manufacturer, and so specified on the purchase order.

5.3 The hydraulic pressure test for upper and lower kelly cocks shall consist of :

- a) a shell test at the appropriate hydrostatic test pressure, with the valve in the "open" position, and
- b) a seat test at the appropriate working pressure, applied to the pin end with the valve in the "closed" position and the box end open to the atmosphere.