Addendum 1
August 2004

EFFECTIVE DATE: FEBRUARY 1, 2005

Specifications for Rotary Drill Stem Elements

API SPECIFICATION 7
FORTIETH EDITION, NOVEMBER 2001

EFFECTIVE DATE: MARCH 2002

American Petroleum Institute

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Addendum 1 to Specifications for Rotary Drill Stem Elements

Table 26, Column 5, change heading:

From: Reference Thread Height, Truncated $h_n = h_s$

To: Thread Height, Truncated $h_n = h_s + 0.001/– 0.003$

Metric Table 26, change heading:

From: Reference Thread Height, Truncated $h_n = h_s$

To: Thread Height, Truncated $h_n = h_s + 0.025/– 0.076$

Table 27, make the following changes, add Note 5:

Table 27—Gauge Dimensions Rotary Shouldered Connections[5]

1	6	7
Size	Major Dia.	Minor Dia.
NC23	2.44101	2.26900
NC26	2.75401	2.58200
NC31	3.26901	3.09700
NC35	3.61701	3.44500
NC38	3.89401	3.72200
NC40	4.15801	3.98600
NC44	4.50301	4.33100
NC46	4.71201	4.54000
NC50	5.12771	4.95570
NC56	5.70138	5.53062
NC61	6.26338	6.09262
NC70	7.13838	6.96762
NC77	7.82638	7.65562

[5]Gauges made before February 1, 2005 may conform to the 2001 40th Edition of API Spec 7.

Table 28, make the following changes, add Note 5:

Table 28—Gauge Thread Dimensions Rotary Shouldered Connections[5]

1	4	6	9	10
Form	Taper	h_g	f_{cs}	f_{cn}
V-038R	2	0.097620	0.065000	0.065000
V-038R	3	0.096994	0.065000	0.065000

[5]Gauges made before February 1, 2005 may conform to the 2001 40th Edition of API Spec 7.

Metric Table 27, Make the following changes, add Note 5:

Metric Table 27—Gauge Dimensions Rotary Shouldered Connections[5]

1	6	7
Size	Major Dia.	Minor Dia.
NC23	62.0015	57.6325
NC26	69.9517	65.5827
NC31	83.0327	78.6637
NC35	91.8719	87.5029
NC38	98.9077	94.5387
NC40	105.6133	101.2443
NC44	114.3763	110.0073
NC46	119.6849	115.3159
NC50	130.2437	125.8747
NC56	144.815	140.4778
NC61	159.0898	154.7526
NC70	181.3148	176.9776
NC77	198.79	194.4528

[5]Gauges made before February 1, 2005 may conform to the 2001 40th Edition of API Spec 7.

Metric Table 28, make the following changes, add Note 5:

Metric Table 28—Gauge Thread Dimensions Rotary Shouldered Connections[5]

1	4	6	9	10
Form	Taper mm/m	h_g	f_{cs}	f_{cn}
V-038R	166.67	2.479548	1.651000	1.651000
V-038R	250.00	2.463648	1.651000	1.651000

[5]Gauges made before February 1, 2005 may conform to the 2001 40th Edition of API Spec 7.

Page 61, H.1, revise the last sentence to read as follows:

"...for determining height lead and taper described in this recommended practice."

Page 62, Table H-1, remove the last sentence from Note 1.

Appendix H, add the following new section H.5:

H.5 Height Measurement

H.5.1 DEFINITION

Height of threads shall be defined as the distance between the crest and root, normal to the axis of the thread.

H.5.2 GAUGE CONTACT POINTS

The contact points for height gauges shall be ball type with a diameter as specified in Table H-2 and shall not contact the thread flank.

H.5.3 HEIGHT GAUGES

Thread height shall be measured with gauges of the type illustrated in Figure H-6 for external threads and internal threads as size permits, or the type illustrated in Figure H-7 for small

internal threads. Such gauges shall have indicators graduated to register the deviation in thread height, as illustrated in Figure H-8. Standard template as shown in Figure H-9 shall be provided for standardizing the height gauge. The standard templates shall be so constructed as to compensate for the error in measuring height parallel to the taper cone instead of parallel to the thread axis. For the U-groove on standard templates, the depth of the groove shall conform to the dimensions shown in Table H-2, column 5, within a tolerance of ± 0.0002 in.

Table H-2—Thread Height Gauge Standards Dimensions in Inches

1	2	3	4	5	6
Thread Form	Taper in./ft	Number Threads Per In.	Calculated Thread Height (Perpendicular to Taper Cone)	Compensated Thread Height (Perpendicular to Taper Cone)	Contact Ball Size + 0.000 – 0.002 in.
V-038R	2	4	0.121554	0.1216	0.072
V-038R	3	4	0.120737	0.1207	0.072
V-0.040	3	5	0.117086	0.1171	0.034
V-0.050	3	4	0.146359	0.1464	0.044
V-0.050	2	4	0.147380	0.1474	0.044
V-0.055	1.5	6	0.055821	0.0558	0.072
V-0.076	1.5	4	0.092320	0.0923	0.072
H-90	2	$3^1/2$	0.099655	0.0997	0.072
H-90	3	$3^1/2$	0.098513	0.0985	0.072
SL-H90	1.25	3	0.089878	0.0899	0.072

H.5.4 ADJUSTMENT

Gauges shall be adjusted when applied to the U-groove for the type of thread to be measured. Gauges having indicators for determining deviation in thread height shall be adjusted to register zero when applied to the applicable groove. For thread height gauges of the type illustrated in Figure H-7, if the standard template cannot be positioned flat on the anvil with the pressure arm applied, the arm shall be shifted out of the way to prevent contact with the standard template during adjustment of checks.

H.5.5 PROCEDURE

The contact ball shall be placed in the proper thread groove with the anvil in a line parallel to the axis of the thread and resting on the crests of the adjacent threads. For gauges of the type illustrated in Figure H-6, the gauge shall be oscillated through a small arc on each side of the position normal to the taper cone. For gauges graduated to measure the thread height error, the minimum plus reading or maximum minus reading on the indicator shall be taken as the thread height error. For gauges of the type illustrated in Figure H-7, the gauge can not be oscillated. Confirm that the gauge is well seated and properly centered in the groove before taking reading.

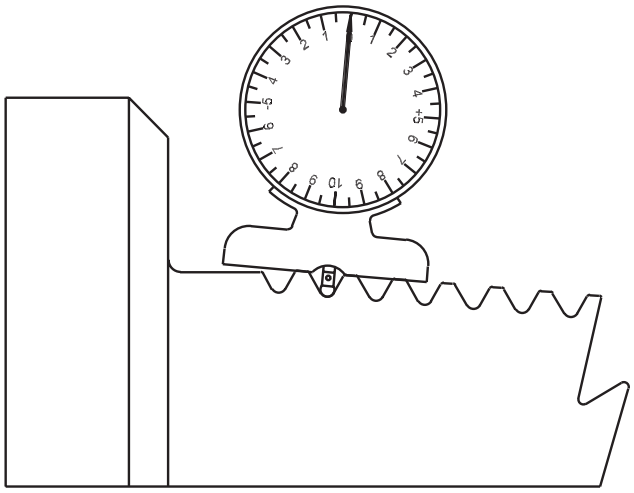

Figure H-6—External Height Gauge

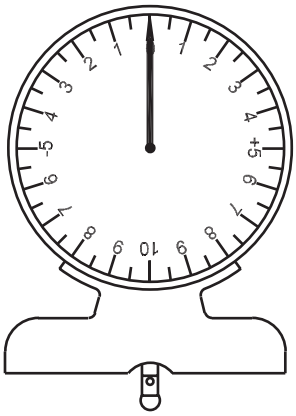

Figure H-8—Balance Dial Type Gauge

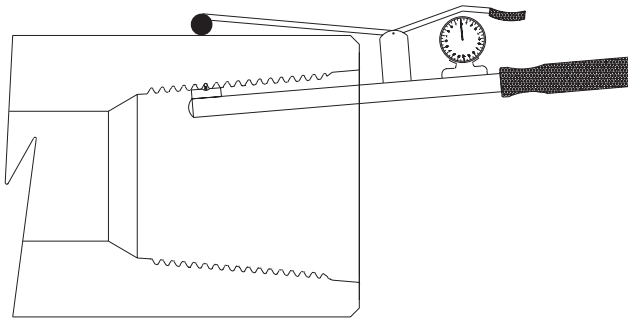

Figure H-7—Internal Height Gauge

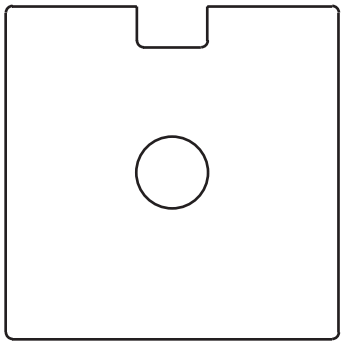

Figure H-9—Standard Height Template

The following Errata items are effective immediately:

Page 10, 6.3.1, replace with the following:

6.3.1 Outside Diameter (*D*) and Inside Diameter (*d*)

6.3.1.1 Outside Diameter (*D*) and Inside Diameter (*d*)

The dimensions of outside diameter (*D*) and inside diameter (*d*) shown in Table 7 result in a tool joint to drill pipe torsional strength ratio approximately 0.8 or greater.

The *d* dimension shown in Table 7 does not apply to boxes. Box inside diameter is at the manufacturer's discretion but shall be at least as large as the pin inside diameter, *d*.

6.3.1.2 Alternative Outside Diameter (*D*) and Inside Diameter (*d*)

When specified in the purchase agreement, tool joints shall be furnished with *D* and *d* not specified in Table 7, but shall otherwise be manufactured in accordance with the requirements of this specification.

Note: Changes in the *D* and *d* dimensions of tool joints may result in a different torsional strength ratio which should be determined by the purchaser to be suitable for the intended application.

Page 28, 9.1.3

- Last sentence, change Table 20 to Table 22

Page 30, Table 24

- Column 3, change 1.500 to 1.468 and 38.10 to 37.29

Page 31, 10.2.5, replace with the following:

10.2.5 The lead tolerance of rotary shouldered connections is as follows:

a. ± 0.0015 inch per inch for any inch (± 0.038 millimeter per millimeter for any 25.4 millimeters) between the first and last full depth threads.
b. ± 0.0045 inch (± 0.114 millimeter) between the first and last full depth threads, or the sum of 0.001 inch for each inch (0.0254 millimeters for each 25.4 millimeters) between the first and last full depth threads, whichever is greater.

Page 33, Figure 20

- Add Note b symbol to the dimension $^{1}/_{2}$ (12.7 mm) max
- Note c, change max. to min.

Page 33, Table 26

- Row V-0.055, Column 4, change 0.14200 to 0.144150
- Row V-0.055, Column 5, change 0.055900 to 0.055930
- Row V-0.055, Column 6, change 0.040600 to 0.040650
- Row V-0.055, Column 7, change 0.047600 to 0.047569

Page 36, Figure 23

- Detail A, change S – 0.001 in. (0.025 mm) to S +/– 0.001 in. (+/– 0.0025 mm)

Page 38, Table 27

- Row 1 REG, Column 7, 1.00890 should be 1.12005
- Row 1-$^{1}/_{2}$ REG, Column 7, 1.39680 should be 1.50705
- Row 1-$^{1}/_{2}$ REG, Column 11, 1.750 should be 1.625

Page 39, Figure 25, add the following Note 4:

[4]For Figure 25, the truncation of the OD, dimension 1.080 to 1.120 in., does not apply to 1 REG or 1-$^{1}/_{2}$ REG.

Page 40, Table 28

- Row V-055, Column 5, change 0.144200 to 0.144150
- Row V-055, Column 6, change 0.089000 to 0.089050 and add Note a to this dimension

Page 44, Figure 27, Table of Weights, 1st, 3rd, and 4th paragraphs should read:

- 1-lb (0.454 kg) weight for gauges in sizes 1 and 1-1/2
- 3-lb (1.362 kg) weight for gauges in sizes 3-1/2 to 4-1/2 and NC35, NC38, NC40, NC44, NC46, and NC50
- 4-lb (1.816 kg) weight for gauges in sizes 5-1/2 to 6-5/8 and NC56 and NC61

Page 71, Section L.4, 4th line:

- Change "..., and the size and style of connection (size and style of tool joint) as shown in Column 1." to "... and the tool joint designation as shown in column 1 of Table 7."

Page 72

- L.7.2 a. change "A 7 1/2 bit with..." to "A 7 5/8 bit with..."
- L.8.b, correct spelling of License

Metric Tables:

Page 82, Metric Table 26,

- Row V-0.055, Column 3, change 3.66268 to 3.66141
- Row V-0.055, Column 4, change 1.420 to 1.42062
- Row V-0.055, Column 5, change 1.03124 to 1.03251
- Row V-0.055, Column 6, change 1.20904 to 1.20825

Page 82, Metric Table 27

- Row 1 REG, Column 7, 25.6489 should be 28.4505
- Row 1 1/2 REG, Column 7, 35.4787 should be 38.28034
- Row 1 1/2 REG, Column 11, 44.45 should be 41.275

Page 83, Metric Table 28

- Row V-055, Column 5, change 3.66268 to 3.66141
- Row V-0.055, Column 6, 2.26060 to 2.26187, add Note a to this dimension

Appendix F, replace the entire appendix with the following:

APPENDIX F—API GRAND AND REGIONAL MASTER ROTARY CONNECTION GAUGES

Tables F-1 to F-4 list the Regional Master Gauges known to be in interchange correspondence with the API Grand Master Gauges at the US National Institute of Standards and Technology. They are listed for the convenience of those wishing to have gauges certified.

Table F-1—Numbered Connections

	NC26	NC31	NC35	NC38	NC40	NC44	NC46	NC50	NC56	NC61	NC70
Grand master gauges	**Gauge registration number**										
National Institute of Standards and Technology, Washington D.C., USA	4401	4402	7000	4403	3005	7001	4404	4405	7002	7003	7004
Regional master gauges											
Chengdu Measuring & Cutting Tool Works, Chengdu, People's Republic of China	—	—	—	7831	—	—	—	7832	—	—	—
Instituto Nacional de Tecnologia Industrial, Buenos Aires, Argentina	7012	7013	—	7014	8082	—	7015	7016	1148	—	—
Brazil	7847	7848	—	7849	7850	—	7851	7852	—	—	—
China National Instrument	—	—	—	—	—	—	—	—	—	—	—
PMC Lone Star, Willoughby, Ohio, USA	10742	10724	8058	10400	10744	8061	10725	10395	—	8065	—
National Institute of Metrology Beijing, People's Republic of China	7834	7835	7836	7837	7838	7839	7840	7841	7842	7843	7844
National Physical Laboratory, Teddington, England	8939	8947	7008	8954	3007	7009	8952	8938	7010	7011	8937
National Research Laboratory, Ibaraki, Japan	—	4420	—	4421	—	—	—	4422	—	—	—
National Measurement Laboratory, Lindfield, N.S.W., Australia	—	—	—	—	—	—	—	—	—	—	—
TGRC China National Petroleum, Baoji, People's Republic of China	1706	1705	1707	1708	1709	1710	10602	1702	1711	1712	1713

Table F-2—Regular Right Hand Connections

	2-3/8 REG	2-7/8 REG	3-1/2 REG	4-1/2 REG	5-1/2 REG	6-5/8 REG	7-5/8 REG	8-5/8 REG
Grand master gauges	**Gauge registration number**							
National Institute of Standards and Technology, Washington D.C., USA	1101	1102	1103	1104	1105	1700	1142	1701
Regional master gauges								
Chengdu Measuring & Cutting Tool Works, Chengdu, People's Republic of China	—	—	—	—	—	—	—	—
Instituto Nacional de Tecnologia Industrial, Buenos Aires, Argentina	1148	1149	1150	6501	6502	6503	6504	—
Brazil	7856	7875	7876	7877	7878	7879	7880	—
China National Instrument	—	—	10615	—	10608	—	—	—
PMC Lone Star, Willoughby, Ohio, USA	1122	1123	1124	1125	1126	1127	10712	1128
National Institute of Metrology, Beijing, People's Republic of China	—	10605	10615	10607	10608	7890	10609	10619
National Physical Laboratory, Teddington, England	8945	8946	8948	8953	8951	8950	1146	1147
National Research Laboratory Ibaraki, Japan	—	—	—	1143	1144	1145	—	—
National Measurement Laboratory, Lindfield, N.S.W., Australia	—	6022	6023	6024	—	6025	—	—
TGRC China National Petroleum, Baoji, People's Republic of China	1714	1731	1715	1704	1716	1717	1718	1719

Table F-3—Regular Left Hand Connections

	2-3/8 REG LH	2-7/8 REG LH	3-1/2 REG LH	4-1/2 REG LH	5-1/2 REG LH	6-5/8 REG LH	7-5/8 REG LH	8-5/8 REG LH
Grand master gauges	**Gauge registration number**							
National Institute of Standards and Technology, Washington D.C., USA	1751	1752	1753	1754	1755	1756	1779	1757
Regional master gauges								
Chengdu Measuring & Cutting Tool Work, Chengdu, People's Republic of China	—	—	—	—	—	—	—	
Instituto Nacional de Tecnologia Industrial, Buenos Aires, Argentina	—	—	—	—	—	—	—	—
Brazil	7881	7882	7883	7884	7885	7886	—	—
China National Instrument	—	—	—	—	—	—	—	—
PMC Lone Star, Willoughby, Ohio, USA	1758	1759	1760	1761	1762	1763	—	1764
National Institute of Metrology, Beijing, People's Republic of China	—	—	—	—	—	—	—	—
National Physical Laboratory, Teddington, England	1771	1772	1773	8940	—	8966	—	—
National Research Laboratory, Ibaraki, Japan	—	—	—	—	—	—	—	—
National Measurement Laboratory, Lindfield, N.S.W., Australia	—	—	—	1916	—	—	—	—
TGRC China National Petroleum, Baoji, People's Republic of China	1724	1725	1726	—	1727	1728	1729	1730

Figure F-4—FH and IF Connections

	3-1/2 FH*	**4-1/2 FH ***	**5-1/2 FH**	**6-5/8 FH**		**5-1/2 IF***		
Grand master gauges	**Gauge registration number**							
National Institute of Standards and Technology, Washington D.C., USA	3001	3002	3003	3004		4406		
Regional master gauges								
Chengdu Measuring & Cutting Tool Works, Chengdu, People's Republic of China	—	—	—	—		—		
Instituto Nacional de Tecnologia Industrial, Buenos Aires, Argentina	—	—	3031	3032		—		
Brazil	7853	7854	7855	—		—		
China National Instrument	—	—	—	—	—	—	—	—
PMC Lone Star, Willoughby, Ohio, USA	—	—	—	—		—	—	
National Institute of Metrology Beijing, People's Republic of China	10620	10612	7845	10613		7846		
National Physical Laboratory, Teddington, England	8949	8957	8955	3010		8967		
National Research Laboratory, Ibaraki, Japan	3027	3028	3030	—		—	-	
National Measurement Laboratory, Lindfield, N.S.W., Australia	—	3228	—	—		—		
TGRC China National Petroleum, Baoji, People's Republic of China	1720	1721	1703	1722		1723		
*These connections are non-preferred, but are supported by the API gauge system for historical reasons.								

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