

INTERNATIONAL STANDARD

**ISO
10422**

First edition
1993-08-01

Petroleum and natural gas industries – Threading, gauging, and thread inspection of casing, tubing and line pipe threads – Specification

*Industries du pétrole et du gaz naturel – Filetage, calibrage et inspection des
filetages des tubes de cuvelage, des tubes de production et de conduites –
Spécifications*



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 10422 was prepared by the American Petroleum Institute (API) (as STD 5B, 13th ed.) and was adopted, under a special "fast-track procedure", by Technical Committee ISO/TC 67, *Materials and equipment for petroleum and natural gas industries*, in parallel with its approval by the ISO member bodies.

© ISO 1993

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Introduction

International Standard ISO 10422:1993 reproduces the content of API STD 5B, 13th edition, 1988. ISO, in endorsing this API document, recognizes that in certain respects the latter does not comply with all current ISO rules on the presentation and content of an International Standard. Therefore, the relevant technical body, within ISO/TC 67, will review ISO 10422:1993 and reissue it, when practicable, in a form complying with these rules.

This International Standard is not intended to obviate the need for sound engineering judgement as to when and where this International Standard should be utilized and users should be aware that additional or differing requirements may be needed to meet the needs for the particular service intended.

Standards referenced herein may be replaced by other international or national standards that can be shown to meet or exceed the requirements of the referenced standards.

Appendix A to this document should not be considered as requirements. It is included only as guidelines.

This page intentionally left blank

Petroleum and natural gas industries – Threading, gauging, and thread inspection of casing, tubing and line pipe threads – Specification

1 Scope

This International Standard specifies dimensional requirements on thread and thread gauges, and covers the instruments and methods for the inspection of threads for line pipe, casing and tubing,

2 Requirements

Requirements are specified in:

“API Specification STD 5B (STD 5B), Thirteenth Edition, May 31, 1988, *Specification for Threading, Gauging, and Thread Inspection of Casing, Tubing and Line Pipe Threads*”,

which is adopted as ISO 10422.

For the purposes of international standardization, however, modifications shall apply to specific clauses and paragraphs of API STD 5B. These modifications are outlined below.

NOTE – A wavy line in the margin indicates the location of a modification to the text of the API publication.

Page 2

TABLE OF CONTENTS

Delete Appendix C.

Page 3

Information given in the POLICY statement is relevant to the API publication only.

Page 4

Information given in the FOREWORD is relevant to the API publication only.

Page 5

Subclause 1.6 Metric conversions

The factors used for converting the pound (lb) and the pound per square inch (psi) shall be replaced as follows:

1 pound (lb) = 0,453 529 37 kg (exactly)

1 pound per square inch (lb/in²) = 0,070 37 kg/cm²

Subclause 1.7 Referenced standards, item c

This part is information which is relevant to the API publication only.

TABLE 1.0, REFERENCED STANDARDS

The equivalent International Standard to API RP 5C1 is ISO 10405:1993, *Petroleum and natural gas industries – Care and use of casing and tubing*.

The provisions of API Spec Q1 (Quality program) do not apply in the framework of this International Standard.

Page 6

SECTION 2, THREAD DIMENSIONS AND TOLERANCES

Subclause 2.3

First paragraph, last three lines shall read:

“... of ISO 10405:1993, *Petroleum and natural gas industries – Care and use of casing and tubing*.

Second paragraph, first sentence: Introduce the metric values as follows:

"A 3/8 in (9,5 mm) high equilateral triangle die stamp shall be placed at a distance of $L_4 + 1/16$ in [L_4 (mm) + 1,6 mm] from each end of 16 in (406,4 mm), 18 5/8 in (473,075 mm) and 20 in (508 mm) 8-round thread casing in grades H40, J55 and K55."

Subclause 2.4, NOTE

Add "(mm)" in the definition of t_0 and D , after "in inches".

Page 7

Subclause 2.5

1st line shall read: "The angle 65° of the outside chamfer..."

Subclause 2.6

9th line shall read: "The threads in steel couplings for line pipe nominal diameter 2 in (50,8 mm) and larger..."

13th line: Replace "which will minimize" by "so as to minimize";

4th line from bottom: The number in parentheses shall be "(0,152 mm)".

Subclause 2.8

2nd line: Add "(25,4 mm)" after "inch".

In the NOTE, the first two lines shall read:

"For line pipe threads finer than 11 1/2 threads per in (11 1/2 threads per 25,4 mm or 0,453 threads/mm), [pipe size smaller than 1 in (25,4 mm) nominal diameter], only..."

Subclause 2.9

5th line shall read: "pipe couplings nominal diameter 6 in (152,4 mm) and larger..."

7th line: The number in parentheses shall read: "(19 mm per 6 100 mm)".

9th to 11th line: Delete the sentence starting "Maximum misalignment" and ending "difficulties".

Page 8

Subclause 2.11

Add the following sentence:

"The criteria for rejection by the purchaser shall be some demonstration that axial misalignment exceeds 0,031 in (0,79 mm), or the angular misalignment exceeds 3/4 in per 20 ft (19 mm per 6 100 mm) of projected axis, or by a check of whether the minimum length of full crest threads (L_c) is present."

Subclause 2.13

Add the following subclause:

"2.13 A hand tight connection is defined as a threaded connection that has been made up by hand without the aid of excessive force. Hand tight standoff "A" is the maximum theoretical make up position of two nominal parts which can be achieved without incurring interference."

Page 15

Subclause 3.1

Replace the existing subclause with the following text:

"All threads covered by this section shall comply with the gauging practice requirements specified herein. Accordingly, any manufacturer who produces products utilizing any of the threads covered by this specification shall have access to master gauges for each size and type of thread produced. Master gauges consist of a plug and mating ring conforming to the requirements of Section 4, and certified as required in Section 5."

NOTE 2

Add the following to the end of the NOTE:

"Good care is as indicated in paragraph 3.2 and paragraph 5.4."

NOTE 3

Delete this note.

NOTE 4

Renumber as NOTE 3.

2nd line: Add "(340 mm)" after "13 3/8 in".

6th line: Add "(406 mm)" after "16 in".

Subclause 3.2

Replace the existing clause with the following text:

"The manufacturer of product threads shall also provide working gauges conforming to the requirements of paragraph 4.2 for use in gauging the product threads, and shall maintain all working gauges in such condition as to ensure that product threads, gauged as required herein, are acceptable under this specification. The manufacturer shall establish and document a frequency for determining interchange standoff of working gauges with master gauges, and for inspecting product threads with working gauges based on his control of the manufacturing process."

Subclause 3.4

Renumber the present NOTE as "NOTE 1:".

Add a new NOTE 2 as follows:

"NOTE 2: *"p" is defined as the distance from a point on a nominal thread form to a corresponding point on the next thread, measured parallel to the axis. This value can be calculated by dividing one inch (25,4 mm) by the number of threads per inch (threads per mm) as indicated in Tables 2.1 through 2.7 to three significant figures.*"

Subclause 3.5

Delete the last four lines from the bottom: "The API monogram... have been met."

Page 17

Subclause 3.6, item a

6th line: The text in parentheses shall read: "(per inch or per 25,4 mm)".

9th line onwards shall read:

"pipe nominal diameter 8 in (203,2 mm) and smaller, and 1/5 thread turn for 8-thread gauges for line pipe nominal diameter 10 in (254 mm) and larger."

Subclause 3.6, item b

7th line onwards shall read:

"for sizes 8 5/8 in (219,1 mm) and smaller, 1/5 thread turn for sizes 9 5/8 in (244,5 mm) and larger, and 1/5 thread turn for all 10-thread gauges."

Subclause 3.6, item c

Last two lines shall read:

"turn for sizes 8 5/8 in (219,1 mm) and smaller, and 1/8 thread turn for sizes 9 5/8 in (244,5 mm) and larger."

Subclause 3.9

9th line: Replace the sentence starting "Other gage dimension..." up to "... reference plane." with the following text:

"Other gauge dimensions which affect *how the gauges may be used* were not changed; therefore, gauges made prior to 1940 may be used, provided proper adjustment in standoff values are made for the shift in reference plane."

Page 18

Right-hand column

2nd line: Delete the period after "mm" in the parentheses and add "(340 mm)" after "13 3/8".

3rd line: Add "(406,4 mm)" after "16 in".

4th and 5th lines: The numbers in parentheses shall be "(E₇ – 0,083 3 L₇ + 1,57 mm)."

Item b, 3rd line from bottom onwards shall read:

"D for sizes 13 3/8 in (340 mm) and smaller, and is equal to the nominal pipe diameter for sizes 16 in (406,4 mm) and larger."

Item e, 3rd and 4th lines shall read:

"13 3/8 in (340 mm) and smaller; for 16 in (406,4 mm) and larger, g is 1.488 in (37,8 mm)."

Item g, 3rd and 4th lines shall read:

"plus 0.016 in (0,41 mm) for sizes 13 3/8 in (340 mm) and smaller; for 16 in (406,4 mm) and larger D₄ is equal to..."

Item j, second line shall read:

"for sizes 13 3/8 in (340 mm) and smaller; crests and roots"

Item j, 3rd line: Add "(406,4 mm)" after "16 in".

Page 19

Subclause 4.8

4th line from bottom: Delete the words "and a gaging notch"; add a period after "gages".

Last two lines: Delete the sentence: "The overall... L₄ – S."

Subclause 4.9

Third and fifth lines: Add "(219 mm)" after "8 5/8".

Item a (table): Metric dimensions shall be introduced as follows:

Size		Plate diameter		Bolt circle	
in	mm	in	mm	in	mm
9 5/8	244,5	9 5/8	244,5	7 1/4	184,2
10	254				
10 3/4	273	10 3/4	273	9 3/8	244,5
11 3/4	298,5				
12	304,8				
13 3/8	340	13 3/8	340	10 3/4	273
14	355,6				
16	406,4	16	406,4	12 3/8	314,3
18	457,2	18	457,2	16	406,4
18 5/8	473				
20	508	20	508	17 3/8	441,3

Page 20

Subclause 4.9

Item b (table): Metric dimensions shall be introduced as follows:

Size		Plate diameter		Bolt circle	
in	mm	in	mm	in	mm
5	127	7	177,8	4	101,6
5 1/2	139,7				
6 5/8	168,3	8	203,2	5 1/4	133,1
7	177,8				
7 1/2	190,5				
8 5/8	215,9				
9 5/8	244,5	9 1/2	241,3	7 1/2	190,5
10 3/4	273				

Subclause 4.11

Delete the last sentence starting: "Unless otherwise stated..."

Item a, **Spec 5B***: Delete this item, then rename existing items "b" to "e" as "a" to "d".

Footnote shall be deleted.

Page 25

Figures 4.6 to 4.7

Metric dimensions shall be added as follows:

5/8" (16 mm) Holes, 4 places
 1/2" (12,7 mm)
 6" (152,4 mm)
 2" (51 mm)

Moreover, the two tables containing the dimensions of the plate diameter (A) and of the bolt circle (B), in relation to the size in inches, may be completed with the metric dimensions given in subclause 4.9.

Page 27

Table 4.10

PLUG GAGE: Change the tolerance concerning "Crest truncation" as follows:

Crest truncation + 0.0040
 - 0.0000

RING GAGE: Change the tolerance concerning "Crest truncation" as follows:

Crest truncation + 0.0040
 - 0.0000

Table 4.11

PLUG GAGE: Major Diameter D_o : Add "Specified size" before

5 1/2 thru 7 in
 7 5/8 thru 13 3/8 in
 16 in and larger

Page 28

Subclause 5.1

5th line: Delete the symbol "†".

After the 3rd address "Rome, Italy", add the following agency:

"National Institute of Metrology,
 Beijing, People's Republic of China."

Replace "National Bureau of Standards" by:

"National Institute of Standards and Technology,
Gaithersburg, Maryland, USA."

Replace "National Research Laboratory" by:

"National Research Metrology Laboratory,
Ibaraki, Japan."

4th line from bottom: Add: "(219,1 mm)" after $8 \frac{5}{8}$ in

2nd line from bottom: Add before "Physikalisch-...":

"Oil Country Tubular Goods Inspection Laboratory,
China National Oil and Gas Exploration & Development Corporation,
People's Republic of China."

Subclause 5.2

12th line and 17th line: Delete the words "with copy to the API Dallas office".

End of subclause: Add the following text:

"Master gauges and certificates of compliance may be transferred. If a certificate is not available, the gauges shall be recertified and a new certificate issued by an agency listed in par. 5.1."

Subclause 5.3

NOTE: Add "(406,4 mm)" after "16 in".

Delete the footnote identified with †.

Subclause 5.5

Item d to be deleted.

Page 29

Subclause 6.4

9th line: Add "(12,7 mm)" after " $\frac{1}{2}$ in"

10th line: Add "(219,1 mm)" after " $8 \frac{5}{8}$ in".

11th line: Add "(273 mm)" after " $10 \frac{3}{4}$ in" and "(25,4 mm)" after "1 in".

18th line: Add " $11 \frac{1}{2}$ threads per 25,4 mm or 0,453 threads/mm)".

First NOTE, 3rd and 4th lines: The sentence shall read:

"Thus, the phrase "number of turns per inch (per mm)" means per inch of thread axis."

Second NOTE, 3rd and 4th lines: Add "(15,9 mm)" after "0.625 inches", and "(12,7 mm)" after "0.500 inches".

The first NOTE shall be numbered "NOTE 1" and the second "NOTE 2".

Page 30

Figure 6.3

2nd and 3rd lines of the caption shall read:

"THREADS IN SIZES 4 in (101,4 mm) NOMINAL DIAMETER
[4 $\frac{1}{2}$ in (114,3 mm) – OD] AND LARGER"

Page 31

Subheading above subclause

This shall be modified to:

"Internal Threads in Sizes 4 in (101,6 mm) Nominal Diameter [4 $\frac{1}{2}$ in (114,3 mm) – OD] and Larger"

Subclause 6.10

2nd line: Make the same changes as above.

Subclause 6.11, right-hand column

5th line shall read: "is the fourth crest on sizes 5 in (127 mm) through 7 5/8 in (155 mm), and..."

7th line: Add "(219 mm)" after "8 5/8 in".

8th line: Add "(273 mm)" after "10 3/4 in".

16th line: Add "(127 mm)" after "5 in", and "(155 mm)" after "7 5/8 in".

18th line: Add "(219 mm)" after "8 5/8 in", and "(273 mm)" after "10 3/4 in".

Subheading above subclause 6.12

This shall be modified to:

"Internal Threads in Sizes Smaller than 4 in (101,6 mm) Nominal Diameter [4 1/2 in (114,3 mm) – OD]"

Subclause 6.12

2nd line shall read: "sizes smaller than nominal diameter 4 in (101,6 mm) [4 1/2 in (114,3 mm) – OD] shall..."

Page 32

Subclause 6.14

6th line: Add "(406,4 mm)" after "16 in".

Subclause 6.15

3rd line shall read: "make up triangle $A_1 + 0.375$ in ($A_1 + 9,5$ mm). The thread must be a..."

Last line shall read: "dial reads + 0.005 in (+ 0,13 mm) or less, ...".

Subclause 6.16

8th line: The value in parentheses shall read "(25,4 mm)".

Table following subclause 6.17

Heading of first column: Add "(25,4 mm)" after "per inch".

Fourth column, values in mm: The decimal marker shall be a comma.

Figure 6.6, Detail A

The caption shall read: "... internal threads in sizes 4 in (101,6 mm) nominal diameter [4 1/2 in (114,3 mm) – OD] and larger"

Figure 6.6, Detail B

The caption shall read: "... than 4 in (101,6 mm) nominal diameter [4 1/2 in (114,3 mm) – OD]"

Page 33

Subclause 6.18

2nd line shall read: "and of internal threads in sizes 4 in (101,6 mm) nominal diameter [4 1/2 in (114,3 mm) – OD]".

5th and 6th lines shall read: "... smaller than 4 in (101,6 mm) nominal diameter [4 1/2 in (114,3 mm) – OD]".

3rd line from bottom: The text in parentheses shall read: "(± 0,003 mm)".

Last line: The text in parentheses shall read: "(± 0,005 mm)".

Figure 6.7, Detail A

The caption shall read:

"... THREADS IN SIZES 3 in (76,2 mm) NOMINAL DIAMETER [3 1/2 in (89 mm) – OD] AND LARGER"

Figure 6.7, Detail B

Add to the caption: "(406,4 mm)" after "16 in".

Page 34

Figure 6.8

The caption shall read:

"... 3 in (76,2 mm) NOMINAL DIAMETER [3 1/2 in (89 mm) – OD]"

Subclause 6.22

2nd line: Add "(127 mm)" after "5 in" and "(193,7 mm)" after "7 5/8 in".

5th line: Add "(219 mm)" after "8 5/8 in" and "(273 mm)" after "10 3/4 in".

8th line: Add at end "(2,29 mm)" after "0.090 in".

Subclause 6.23 (left-hand column)

7th line: Add "(406,4 mm)" after "16 in".

Last line (before the table) shall read: "within a tolerance of $\pm 0.000 2$ in ($\pm 0,005$ mm)."

27th and 28th lines: The same correction applies.

Last line of first table: Add "(340 mm)" after "13 3/8 in".

5th line from bottom: Add "(406,4 mm)" after "16 in".

Right-hand column

4th line shall read: "Sizes 5 in (127 mm) to 7 5/8 in (193,7 mm)".

13th line shall read: "Sizes 8 5/8 in (219 mm) through 10 3/4 in (273 mm)".

Subclause 6.24

14th line shall read: "tolerance of ± 0.0005 in ($\pm 0,013$ mm). ..."

18th line shall read: "than 3 in (76,2 mm) nominal diameter. ..."

22nd line: Add "(340 mm)" after "13 3/8 in".

29th line and 32nd lines: Add "(406,4 mm)" after "16 in".

Page 35

Subclause 6.25

First two lines shall read:

"External Threads and Internal Threads in Sizes 3 in (76,2 mm) Nominal Diameter [3 1/2 in (89 mm) – OD] and Larger."

5th line shall read: "in sizes 3 in (76,2 mm) nominal diameter and larger. The tip of the".

Subclause 6.26

First two lines shall read:

Internal Threads in Sizes Smaller than 3 in (76,2 mm) Nominal Diameter [3 1/2 in (89 mm) – OD]. The gauge illustrated".

4th line shall read: "... smaller than 3 in (76,2 mm) nominal diameter."

Subclause 6.28

8th line shall read: "0.100 in (2,54 mm)".

9th line: The number in parentheses shall read "(0,762 mm)".

Page 36

Subclause 6.30, item b

11th line shall read: "(101,6 mm) nominal diameter [4 1/2 in (114,3 mm) – OD] and larger, and at least..."

13th line: Insert "(101,6 mm)" after "4 in".

14th line shall read: "[4 1/2 in (114,3 mm) – OD]."

Subclause 6.30, item c

13th line shall read: "in the range from 260 °F to 266 °F (127 °C to 130 °C) and".

Subclause 6.30, item d

4th line: Delete the dot after the symbol "g" for gram (28,3 g). Substitute "cm³" for "c.c." (28,6 cm³ or 0,028 6 l)

6th line: Delete the dot after the symbol "g" for gram (40 g).

Page 37

Subclause 6.34

3rd line from top: The number in the first parentheses shall be "(2,21 mm)". The number in the second parentheses shall be "(0,584 mm)".

Subclause 6.35

8th line: The number in parentheses shall be "(> 0,08 mm)".

11th line: The number in parentheses shall be "(± 0,03 mm)".

Subclause 6.35, right-hand column

The first six lines shall read:

"number two and three dials, sizes 7/8 in (193,7 mm) and smaller, $\begin{smallmatrix} +0 \\ -0.003 \end{smallmatrix}$ in ($\begin{smallmatrix} +0 \\ -0.08 \end{smallmatrix}$ mm), sizes over 7/8 in, $\begin{smallmatrix} +0 \\ -0.005 \end{smallmatrix}$ in ($\begin{smallmatrix} +0 \\ -0.13 \end{smallmatrix}$ mm). When using the gauge "C" illustrated in figure 6.13, the tolerances from zero setting are $\begin{smallmatrix} +0 \\ -0.003 \end{smallmatrix}$ in ($\begin{smallmatrix} +0 \\ -0.08 \end{smallmatrix}$ mm) for sizes 7/8 in and smaller, and $\begin{smallmatrix} +0 \\ -0.005 \end{smallmatrix}$ ($\begin{smallmatrix} +0 \\ -0.13 \end{smallmatrix}$ mm) for sizes over 7/8 in."

Subclause 6.36

8th line: The number in parentheses shall be "(> 0,08 mm)".

10th line: The sentence shall read:

"The tolerances from zero setting are, number or dial, ± 0.001 in (± 0,03 mm), number two and three dials, from – 0.001 in (– 0,03 mm) to – 0.004 in (– 0,10 mm)."

Last two lines shall read: "... from zero setting are – 0.001 in (– 0,03 mm) to – 0.004 in (– 0,10 mm) for all sizes."

Page 38

Subclause 6.38, right-hand column

4th line: The number in parentheses shall be "(2,54 mm)".

5th line: The number in parentheses shall be "(0,762 mm)".

Page 40

Figure 6.18

The caption shall read:

"... IN SIZES 4 in (101,6 mm) NOMINAL DIAMETER [4 1/2 in (114,3 mm) – OD] AND LARGER"

Page 41

Figure 6.19

The caption shall read:

"... THAN 4 in (101,6 mm) NOMINAL DIAMETER [4 1/2 in (114,3 mm) – OD]"

Page 42

Figure 6.20

The caption shall read:

"... THREADS IN SIZES 4 in (101,6 mm) NOMINAL DIAMETER [4 1/2 in (114,3 mm) – OD] AND LARGER"

Figure 6.21

The caption shall read:

"... SMALLER THAN 4 in (101,6 mm) NOMINAL DIAMETER [4 1/2 in (114,3 mm) – OD]"

Page 43

Figure 6.22

The caption shall read:

"... THREADS IN SIZES 3 in (76,2 mm) NOMINAL DIAMETER [3 1/2 in (89 mm) – OD] AND LARGER"

Page 44

Figure 6.23

The caption shall read:

"... SMALLER THAN 3 in (76,2 mm) NOMINAL DIAMETER [3 1/2 in (89 mm) – OD]"

Page 46

Subclause 7.6

2nd line: Delete the reference to "API".

Page 51

Table 7.3, left-hand column

9th line shall read: "Sizes 5 in (127 mm) through 7 5/8 in (193,7 mm)".

15th line shall read: "Sizes 8 5/8 in (219 mm) through 10 3/4 in (273 mm)".

Table 7.3, right-hand column

4th line of NOTE: The number in parentheses shall be "(± 0,03 mm)".

Paragraph entitled "**Seal**", 3rd line: The number in parentheses shall be "(± 5,21 mm per metre)".

6th line: The number in parentheses shall be "(292,1 mm ± 6,35 mm)".

Page 56

Subclause 7.7

4th line: Delete the reference to "API".

Subclause 7.9

7th line: The number in parentheses shall be "(± 0,038 mm)".

9th line: The number in parentheses shall be "(± 0,05 mm)".

Right-hand column

Delete the last sentence of 7.9 starting from "The API monogram" up to and including "have been met."

Subclause 7.10

8th line: The number in parentheses shall be "(– 0,30 mm)".

9th line: The number in parentheses shall be "(– 0,25 mm)".

Page 58

Subclause 7.11

Replace the existing text with the following:

"Grand Master Plug Gauges. The grand master plug gauges comply with the same limitations and tolerances as prescribed herein for the reference master plug gauges. Grand master plug gauges for all sizes of extreme-line casing are deposited with the National Institute of Standards and Technology (NIST), Gaithersburg, Maryland 20899, USA."

Subclause 7.12, item j

The last two lines shall read: "1.000 in (25,4 mm). See detail B: $m = b - 1.000 \text{ in } (b - 25,4 \text{ mm})$."

Subclause 7.15

13th line: The number in parentheses shall be "(± 0,03 mm)".

EXAMPLE, 2nd line: Add "(139,7 mm)" after "5 1/2 in".

5th line from bottom: The number in parentheses shall be "(− 0,008 mm)".

Page 59

Subclause 7.15, paragraph (a)

4th line from top: The number in parentheses shall be "(− 0,008 mm)".

8th line: The number in parentheses shall be "(− 0,028 mm)".

10th line: Delete "or" in the parentheses "(8,143 mm)".

16th line: The numbers in parentheses shall be "(8,151 mm ± 0,038 mm)".

Last but one line: The numbers in parentheses shall be "(8,171 mm ± 0,038 mm)".

Subclause 7.15, paragraph (b)

7th line: The number in parentheses shall be "(± 0,046 mm)".

9th line: Delete "or" in the parentheses

12th line: The number in parentheses shall be "(38,1 mm)".

15th line: The number in parentheses shall be "(± 0,046 mm)".

19th line: The number in parentheses shall be "(± 0,015 mm)".

21st and 22nd lines: Delete "or" in the parentheses.

25th line: The number in parentheses shall be "(63,5 mm)".

27th line: The numbers in parentheses shall be "(63,515 mm ± 0,051 mm)".

Last line: The numbers in parentheses shall be "(3,653 mm ± 0,051 mm)".

Subclause 7.21, item a

Delete this item, then rename items "b" to "f" as "a" to "e".

Page 63

Figure 7.8

Caption shall read:

"GAUGE DETAILS – SIZES 5 in (127 mm) THROUGH 7 5/8 in (193,7 mm)"

Last line below the caption: Add "(193,7 mm)" after "7 5/8 in".

Figure 7.9

Caption shall read:

"GAUGE DETAILS – SIZES 8 5/8 in (219 mm) THROUGH 10 3/4 in (273 mm)"

Last line below the caption: Add "(219 mm)" after "8⁵/₈ in".

Page 64

Figure 7.10

Caption shall read:

"GAUGE THREAD FORM – SIZES 5 in (127 mm) THROUGH 7 ⁵/₈ in (193,7 mm)"

Page 65

Figure 7.11

Caption shall read:

"GAUGE THREAD FORM – SIZES 8 ⁵/₈ in (219 mm) THROUGH 10 ³/₄ in (273 mm)"

Page 66

Subclause 7.22

5th and 6th lines shall read:

"... of the agencies listed in paragraph 5.1 however, the ring gauge must be sent to the National Institute of Standards and Technology..."

Delete the list of laboratories given in 7.22, starting with "Laboratoire National d'Essais, Paris, France" up to and including "Braunschweig, Germany".

Subclause 7.23

12th line: Add "(ISO 10422:1993)" after "API Std 5B".

Third paragraph, 2nd line: Substitute "Institute of Standards and Technology" for "Bureau of Standards".

Fourth paragraph: Delete this from "Copies of all..." up to and including "... Dallas Office."

Subclause 7.25

Fourth paragraph, 2nd and 3rd lines: Add "(yyy mm)" after ".xxx in".

Page 67

Subclause 8.1

3rd and 5th lines: Substitute "ISO 10422:1993" for "API Std 5B" and for "Spec 5B".

6th line up to the 13th line: Delete the text starting "The thread marking may be applied..." up to and including "... may be omitted."

Subclause 8.2

1st and 4th lines: Substitute "ISO 10422:1993" for "Spec 5B" and for "API Std 5B".

4th line: Put a period after "ISO 10422:1993". Delete the remaining part of 8.1 as well as the footnote starting "*Users of this specification..."

Appendix A, paragraph A.5

Delete the first and the second sentences so that A.5 reads as follows:

"Shipment should preferably be by a fast system of transit. Owners should prescribe to the custodian the preferable method of transit for return of gauges."

Paragraphs A.7, A.8 and A.10 shall be deleted.

Page 69

Metric table 2.2

Heading of column 3: Substitute "Linear density" for "Nominal Weight".

Footnote, 1st line, shall read:

"* $L_c = L_4 - 28,575 \text{ mm}$ ($L_4 - 1,125 \text{ in}$) for 8 round thread casing."

Metric table 2.3

Footnote, 1st line, shall read:

"* $L_c = L_4 - 28,575 \text{ mm}$ ($L_4 - 1,125 \text{ in}$) for 8 round thread casing."

Page 70

Metric table 2.4

NOTE (1), 2nd line: Add "(340 mm)" after "13 3/8 in".

NOTE (1), 3rd line: Add "(406,4 mm)" after "16 in".

Footnote identified by an asterisk: The first sentence shall read:

"* $L_c = L_7 - 10,16 \text{ mm}$ ($L_7 - 0.400 \text{ in}$) for buttress thread casing."

Page 71

Figure 2.5

Caption, last line, shall read: "For all sizes 4 1/2 in (114,3 mm) through 13 3/8 in (340 mm)".

Figure 2.6

Caption, last line, shall read: "For sizes 16 in (406,4 mm) and larger".

Page 72

Metric table 2.5

Footnote identified by an asterisk shall read:

"* $L_c = L_4 - 22,86 \text{ mm}$ ($L_4 - 0.900 \text{ in}$) for 10 thread tubing. $L_c = L_4 - 25,4 \text{ mm}$ ($L_4 - 1.000 \text{ in}$) for 8 thread tubing."

Metric table 2.6

Same amendment as above.

Page 73

Metric table 2.6a

Same amendment as for TABLE 2.5 (page 72).

Metric table 2.7

The footnote identified by an asterisk shall read:

"* $L_c = L_4 - 22,86 \text{ mm}$ ($L_4 - 0.900 \text{ in}$) for 10 thread tubing."

Metric table 2.8

Heading of columns 2 to 6: Substitute "25,4 mm (1 in)" for "Inch".

Metric table 2.9

Heading of columns 2 and 3: Substitute "25,4 mm (1 in)" for "Inch".

Page 74

Metric table 2.10

Substitute the symbol "°" for "deg." (3 places).

Footnote 4: Amend to read "smaller than 25,4 mm (1 in)".

Metric table 2.11

Under the heading "Lead" amend to read as follows:

"Lead:²

Per 25,4 mm (1 in)

340 mm (13 3/8 in) and smaller ± 0,051 mm

406,4 mm (16 in) and larger ± 0,076 mm

Cumulative ± 0,102 mm"

Footnote 2: The first sentence shall read:

"The lead tolerance per 25,4 mm (1 in) is the maximum allowable error in any unit length of 25,4 mm (1 in) within the perfect thread length."

Substitute the symbol "°" for "deg." (3 places).

Page 76

Metric table 4.1

3rd line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C," and add "except as otherwise indicated. See figure 4.1."

Footnote: Amend to read "... for sizes 335,6 mm (14 in) through 508 mm (20 in)."

Metric table 4.2

3rd line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C, ..."

Page 77

Metric table 4.3

3rd line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C," and add "except as otherwise indicated. See figure 4.1."

The two lines below the table shall be amended to read:

"Included taper on diameter: Sizes 340 mm (13 3/8 in) and smaller – ...
Sizes 406,4 mm (16 in) and larger – ..."

Metric table 4.4

3rd line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C, ..."

Page 78

Metric table 4.5

3rd line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C, ..."

Metric table 4.6

Same amendment as for table 4.5.

NOTE below table 4.6 shall be amended as follows:

first paragraph, 1st line:

"The 33,4 mm (1.315 in), 42,2 mm (1.660 in) and 48,3 mm (1.900 in) integral-joint tubing gauges..."

second paragraph, 1st line:

"The 52,4 mm (2.063 in) integral-joint tubing gauges are identical to the 48,3 mm (1.900 in) external-upset tubing gauges..."

third paragraph, 1st line:

"The 26,7 mm (1.050 in) external-upset tubing gauges, the 33,4 mm (1.315 in) non-upset tubing gauges, and the 33,4 mm (1.315 in) integral-joint tubing gauges..."

Page 79

Metric table 4.7

3rd line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C."

Headings of columns 2 to 6: Substitute "25,4 mm (1 in)" for "Inch".

Metric table 4.8

3rd line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C."

Headings of columns 2 and 3: Substitute "25,4 mm (1 in)" for "Inch".

Metric figure 4.4

Text above the caption shall read: "TAPER = 62,5 mm per metre (3/4 in per ft) on diameter."

Caption, 3rd line, shall read: "For sizes 114,3 mm (4 1/2 in) through 340 mm (13 3/8 in)."

Metric figure 4.5

Text above the caption shall read: "TAPER = 83,3 mm per metre (1 in per ft) on diameter."

Caption, 3rd line, shall read: "For sizes 406,4 mm (16 in) and larger."

Page 80

Metric table 4.9

3rd line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C, ..."

Page 81

Metric table 4.10

4th line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C, ..."

"PLUG GAGE": Change the tolerance concerning "crest truncation", as follows:

Crest truncation $+0,102$
-0

"RING GAGE": Change the tolerance concerning "crest truncation", as follows:

Crest truncation $+0,102$
-0

Footnote identified by ***, 2nd line: The numerical value shall read: " $\pm 0,635$ mm".

Metric table 4.11

3rd line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C."

"PLUG GAGE", Major Diameter, D_0 : Amend to read:

"Specified size 139,7 mm (5 1/2 in) through 177,8 mm (7 in)
Specified size 155 mm (7 5/8 in) through 340 mm (13 3/8 in)
Specified size 406,4 mm (16 in) and larger
†Taper, 340 mm (13 3/8 in) and smaller
406,4 mm (16 in) and larger "

*Diameter of collar: Amend to read:

" D_4 , 340 mm (13 3/8 in) and smaller
406,4 mm (16 in) and larger "

"RING GAGE": 1st two lines shall read:

"†Taper, 340 mm (13 3/8 in) and smaller
406,4 mm (16 in) and larger "

Footnote identified by "†": At the end of 3rd line, delete the reference to "API".

Metric table 6.1

Footnote shall read: "*Equivalent to 4p for 0,452 8 thread per mm (11 1/2 threads per inch)."

Page 82

Metric figure 7.1

Caption shall read:

"MACHINING DETAILS – SIZES 127 mm (5 in) THROUGH 155 mm (7 5/8 in)"

Right-hand column, 2nd line, shall read: "... for sizes over 155 mm (7 5/8 in)".

Page 83

Metric table 7.1

Heading shall read:

"... SIZES 127 mm (5 in) THROUGH 155 mm (7 5/8 in)"

4th line of the heading: Amend to read "... for sizes over 155 mm (7 5/8 in)".

Heading of column 2: Substitute "Linear density" for "Nominal Weight" (in two places).

Page 84

Metric figure 7.2

Caption shall read:

"MACHINING DETAILS – SIZES 219 mm (8 5/8 in) THROUGH 273 mm (10 3/4 in)"

Right-hand column: Amend to read: "... for sizes under 219 mm (8 5/8 in)".

Page 85

Metric table 7.2

Heading shall read:

"... – SIZES 219 mm (8 5/8 in) THROUGH 273 mm (10 3/4 in)"

4th line of the heading: Amend to read "... for sizes under 219 mm (8 5/8 in)".

Heading of column 2: Substitute "Linear density" for "Nominal Weight" (in two places).

Page 86

Metric figure 7.3

Caption shall read:

"BOX AND PIN ENTRANCE THREADS – SIZES 127 mm (5 in) THROUGH 155 mm (7 5/8 in)"

3rd line below caption: Amend to read "... for sizes over 155 mm (7 5/8 in)".

Page 87

Metric figure 7.5

Caption shall read:

"BOX AND PIN ENTRANCE THREADS – SIZES 219 mm (8 5/8 in) THROUGH 273 mm (10 3/4 in)"

3rd line below caption: Amend to read "... for sizes under 219 mm (8 5/8 in)".

Page 88

Metric figure 7.4

Caption shall read:

"PRODUCT THREAD FORM – SIZES 127 mm (5 in) THROUGH 155 mm (7 5/8 in) 0,236 2 THREADS PER mm (6 threads per in) – 125 mm TAPER PER metre (1 1/2 in per ft) ON DIAMETER"

2nd line below caption: Amend to read "..., sizes over 155 mm (7 5/8 in)".

Metric figure 7.6

Caption shall read:

"PRODUCT THREAD FORM – SIZES 219 mm (8 5/8 in) THROUGH 273 mm (10 3/4 in) 0,1969 THREADS PER mm (5 threads per in) – 39,7 mm TAPER PER metre (1 1/4 in taper per ft) ON DIAMETER"

2nd line below caption: Amend to read "..., sizes under 219 mm (8 5/8 in)".

Page 90

Metric table 7.4

3rd line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C".

Page 91

Metric table 7.5

4th line of the heading: Amend the symbol for degrees Celsius to read "at 20 °C".

Page 93

Metric figure 7.8

Caption shall read:

"... – SIZES 127 mm (5 in) THROUGH 155 mm (7 5/8 in)"

5th line below caption: Amend to read "... for sizes over 155 mm (7 5/8 in)".

Metric figure 7.9

Caption shall read:

"... – SIZES 219 mm (8 5/8 in) THROUGH 273 mm (10 3/4 in)"

5th line below caption: Amend to read "... for sizes under 219 mm (8 5/8 in)".

Page 94

Metric figure 7.10

Caption shall read:

"... – SIZES 127 mm (5 in) THROUGH 155 mm (7 5/8 in)"

Metric figure 7.11

Caption shall read:

"... – SIZES 219 mm (8 5/8 in) THROUGH 273 mm (10 3/4 in)"

Pages 95 to 97

Information given in APPENDIX C is relevant to the API publication only. APPENDIX C therefore shall be deleted.

Page 98

Information given in EXHIBIT A is relevant to the API publication only. EXHIBIT A therefore shall be deleted.

Page 99

EXHIBIT B is relevant to the API publication only. EXHIBIT B therefore shall be deleted.

Page 100

Information in EXHIBIT C is relevant to the API publication only. EXHIBIT C therefore shall be deleted.

Specification for Threading, Gaging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads

API SPECIFICATION STD 5B (STD 5B)
THIRTEENTH EDITION, MAY 31, 1988

American Petroleum Institute
1220 L Street, Northwest
Washington, DC 20005



This page intentionally left blank

Issued by
AMERICAN PETROLEUM INSTITUTE
Production Department

FOR INFORMATION CONCERNING TECHNICAL CONTENTS OF
THIS PUBLICATION CONTACT THE API PRODUCTION DEPARTMENT,
211 N. ERVAY, SUITE 1700, DALLAS, TX 75201 — (214) 220-9111.
SEE BACK SIDE FOR INFORMATION CONCERNING HOW TO OBTAIN
ADDITIONAL COPIES OF THIS PUBLICATION.

Users of this publication should become familiar with its
scope and content. This document is intended to supplement
rather than replace individual engineering judgment.

OFFICIAL PUBLICATION



REG. U.S. PATENT OFFICE

Copyright © 1988 American Petroleum Institute

TABLE OF CONTENTS

	Page
Policy	3
Foreword	4
Section 1: Scope	5
Section 2: Thread Dimensions and Tolerances (Line Pipe, Round-Thread Casing and Tubing, and Buttress Thread Casing)	6
Section 3: Gaging Practice (Line Pipe, Round-Thread Casing and Tubing, and Buttress Thread Casing)	15
Section 4: Gage Specification (Line Pipe, Round-Thread Casing and Tubing, and Buttress Thread Casing)	18
Section 5: Gage Certification (Line Pipe, Round-Thread Casing and Tubing, and Buttress Thread Casing)	28
Section 6: Thread Inspection (Line Pipe, Round-Thread Casing and Tubing, Buttress Thread Casing, and Extreme-Line Casing)	29
Section 7: Extreme-Line Casing	46
Part 1: Thread and Seal Dimensions and Tolerances	46
Part 2: Gaging Practice	56
Part 3: Gage Specification	58
Part 4: Gage Certification	66
Section 8: Thread Marking	67
Appendix A: Instructions for Shipment of Reference Master Gages	67
Appendix B: Metric Tables and Figures	68
Appendix C: Policy and Procedures for Use of API Monogram	95

Note

This edition of Std 5B supersedes the 12th edition dated May 31, 1987.

This specification was originally issued in 1939 as Std 5B, Specification for Inspection of External and Internal Pipe Threads. Revised editions were issued in 1941 and 1954.

The 4th edition, issued in 1962, was expanded to include, in addition to thread inspection, dimensional requirements on threads and thread gages, stipulations on gaging practice, gage specifications, and gage certification, for casing, tubing, and line pipe, including couplings, as covered by API Std 5A, 5AC, 5AX, and 5L. The title of Std 5B was changed with the 4th edition to Specification for Threading, Gaging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads. Subsequent editions were issued in 1963, 1965, 1968, 1971, 1974, 1979, 1985, and 1987.

Acknowledgment is hereby given to United States Steel Corporation for dedicating to the public all patents covering buttress casing, and to Armco Division, Armco Steel Corporation for dedicating to the public all patents covering extreme-line casing.

Requests for permission to reproduce or translate all or any part of the material published herein should be addressed to the Director, Production Department, 211 N. Ervey, Suite 1700, Dallas TX 75201.

POLICY

(a) API PUBLICATIONS NECESSARILY ADDRESS PROBLEMS OF A GENERAL NATURE. WITH RESPECT TO PARTICULAR CIRCUMSTANCES, LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS SHOULD BE REVIEWED.

(b) API IS NOT UNDERTAKING TO MEET DUTIES OF EMPLOYERS, MANUFACTURERS OR SUPPLIERS TO WARN AND PROPERLY TRAIN AND EQUIP THEIR EMPLOYEES, AND OTHERS EXPOSED, CONCERNING HEALTH AND SAFETY RISKS AND PRECAUTIONS, NOR UNDERTAKING THEIR OBLIGATIONS UNDER LOCAL, STATE, OR FEDERAL LAWS.

(c) NOTHING CONTAINED IN ANY API PUBLICATION IS TO BE CONSTRUED AS GRANTING ANY RIGHT, BY IMPLICATION OR OTHERWISE, FOR THE MANUFACTURE, SALE, OR USE OF ANY METHOD, APPARATUS, OR PRODUCT COVERED BY LETTERS PATENT. NEITHER

SHOULD ANYTHING CONTAINED IN THE PUBLICATION BE CONSTRUED AS INSURING ANYONE AGAINST LIABILITY FOR INFRINGEMENT OF LETTERS PATENT.

(d) GENERALLY, API STANDARDS ARE REVIEWED AND REVISED, REAFFIRMED, OR WITHDRAWN AT LEAST EVERY FIVE YEARS. SOMETIMES A ONE-TIME EXTENSION OF UP TO TWO YEARS WILL BE ADDED TO THIS REVIEW CYCLE. THIS PUBLICATION WILL NO LONGER BE IN EFFECT FIVE YEARS AFTER ITS PUBLICATION DATE AS AN OPERATIVE API STANDARD OR, WHERE AN EXTENSION HAS BEEN GRANTED, UPON REPUBLICATION. STATUS OF THE PUBLICATION CAN BE ASCERTAINED FROM THE API PRODUCTION DEPARTMENT (TEL. 214-220-9111). A CATALOG OF API PUBLICATIONS AND MATERIALS IS PUBLISHED ANNUALLY AND UPDATED QUARTERLY BY API, 1220 L ST., N.W., WASHINGTON, D.C. 20005.

API SPECIFICATION FOR THREADING, GAGING, AND THREAD INSPECTION OF CASING, TUBING, AND LINE PIPE THREADS

FOREWORD

(a) American Petroleum Institute (API) Specifications are published as aids to the procurement of standardized equipment and materials, as well as instructions to manufacturers of equipment or materials covered by an API Specification. These Specifications are not intended to obviate the need for sound engineering, nor to inhibit in any way anyone from purchasing or producing products to other specifications.

(b) The formulation and publication of API Specifications and the API monogram program is not intended in any way to inhibit the purchase of products from companies not licensed to use the API monogram.

(c) API Specifications may be used by anyone desiring to do so, and diligent effort has been made by the Institute to assure the accuracy and reliability of the data contained therein. However, the Institute makes no representation, warranty, or guarantee in connection with the publication of any API Specification and here-

by expressly disclaims any liability or responsibility for loss or damage resulting from their use, for any violation of any federal, state, or municipal regulation with which an API Specification may conflict, or for the infringement of any patent resulting from the use of an API Specification.

(d) Any manufacturer producing equipment or materials intended to conform to an API Specification is responsible for complying with all the provisions of that Specification including all the applicable provisions of API Spec Q1, *Specification for Quality Programs*, required by the product specification. The American Petroleum Institute does not represent, warrant or guarantee that such products do in fact conform to the applicable API standard or specification.

The procedure for obtaining authorization to use the API monogram is given in Appendix C.

Attention Users: Portions of this publication have been changed from the previous edition. The location of changes have been marked with a bar in the margin, as shown to the left of this paragraph. In some cases the changes are significant, while in other cases the changes reflect minor editorial adjustments. The bar notations in the margins are provided as an aid to users as to those parts of this publication that have been changed from the previous edition, but API makes no warranty as to the accuracy of such bar notations.

SECTION 1 SCOPE

1.1 This specification covers dimensional requirements on threads and thread gages and stipulations on gaging practice, gage specifications and certification as well as the instruments and methods for the inspection of threads for line pipe, round-thread casing and tubing, buttress casing and extreme-line casing joints. It is applicable when so stipulated in the API standard governing the product. The inspection procedures for measurements of taper, lead, height, and angle of thread are applicable only to threads having 11½ or less turns per inch. All thread dimensions shown without tolerances are related to the basis for joint design and are not subject to measurement to determine acceptance or rejection of product.

1.2 Thread inspection applies at the point of manufacture prior to shipment, to inspection at any intermediate point, to inspection subsequent to delivery at destination, and to inspection by inspectors representing the purchaser or the manufacturer. The manufacturer may, at his option, use other instruments or methods to control manufacturing operations; but acceptance and rejection of the product shall be governed solely by the results of inspection made in accordance with the requirements of this specification.

1.3 Although this specification contains complete dimensional information for threading and gaging buttress and extreme-line casing joints, considerable skill and know-how is required for the tooling for, and machining of, these joints. Therefore, any manufacturer who desires to produce these joints is advised to consult with manufacturers who have produced these joints before attempting their manufacture.

1.4 This specification is under the jurisdiction of the API Committee on Standardization of Tubular Goods.

1. *Shall* is used to indicate that a provision is mandatory.
2. *Should* is used to indicate that a provision is not mandatory, but recommended as good practice.
3. *May* is used to indicate that a provision is optional.

1.5 The applicable product specification should be consulted for requirements on pipe and couplings not given herein.

1.6 **Metric Conversions.** Metric conversions of English units are provided throughout the text of this specification in parentheses, e.g., 6 in. (152,4 mm). Note use of comma instead of period for decimal point in metric values. Tables and figures containing English units are reproduced in the metric system in Appendix B. The factors used for conversion of English units to metric values are:

1 inch (in.)	= 25,4 millimeters (mm) exactly
1 square inch	= 645,16 square millimeters (mm ²) exactly
1 foot (ft)	= 0,3048 meters (m) exactly
1 pound (lb)	= 0,454 kilograms (kg)
1 pound per foot (lb/ft)	= 1,4895 kilograms per meter (kg/m)
1 pound per square inch (psi)	= 0,0703 kilograms per square centimeter (kg/cm ²)
1 foot-pound (ft-lb)	= 0,138 kilogram meters (kgm)

1.7 Referenced Standards

- a. **General.** This specification includes by reference, either in total or in part, other API, industry and government standards listed in Table 1.0.
- b. **Requirements.** Requirements of other standards included by reference in this specification are essential to the safety and interchangeability of the equipment produced.
- c. **Equivalent Standards.** Other nationally or internationally recognized standards shall be submitted to and approved by API for inclusion in this specification prior to their use as equivalent standards.

TABLE 1.0
REFERENCED STANDARDS

1. API RP5C1:	Recommended Practice on the Care and Use of Casing and Tubing	Latest Edition
2. API Bul. 5A2:	Bulletin on Thread Compounds	Latest Edition
3. API Spec Q1:	Specification for Quality Programs	Latest Edition

SECTION 2 THREAD DIMENSIONS AND TOLERANCES

LINE PIPE, ROUND-THREAD CASING AND TUBING, AND BUTTRESS THREAD CASING

2.1 Thread length shall be measured parallel to the thread axis; thread height and diameter shall be measured normal to the thread axis; lead of line pipe and round threads shall be measured parallel to the axis along the pitch cone and, for buttress threads, parallel to the thread axis, approximately along the pitch cone, for both the external and the internal thread. On line pipe and round threads, the included taper shall be measured on the diameter along the pitch cone and, for buttress threads, on the diameter along the minor cone for the external thread and the major cone for the internal thread. For gaging procedure, see Sect. 6.

2.2 Threads shall be free from visible tears, cuts, grinds, shoulders, or any other imperfections* which break the continuity of the threads, within the minimum length of full crest threads from end of pipe (L_c). Superficial scratches, minor dings and surface irregularities that do not affect the continuity of thread surfaces are occasionally encountered and may not necessarily be detrimental. Because of the difficulty in defining superficial scratches, minor dings and surface irregularities, and the degree to which they affect thread performance, no blanket waiver of such imperfections can be established. As a guide to acceptance, the most critical consideration is to ensure that there are no detectable protrusions on the threads that can peel off the protective coating on the coupling threads or score mating surfaces. Cosmetic repair of thread surfaces by hand is permitted. Imperfections between the L_c length and the vanish point are permissible providing their depth does not extend below the root cone of the thread, or extend beyond $12\frac{1}{2}\%$ of nominal wall (measured from the projected pipe surface) whichever is greater. Grinding to probe or to eliminate defects** is also permitted in this area, with the depth of grind having the same limits as imperfections in this area. Imperfections include such other discontinuities as seams, overlaps, pits, tool marks, dents, handling damage, etc. Minor pitting and thread discoloration may also be encountered and may not necessarily be detrimental. Because of the difficulty in defining pitting and discoloration and the degree to which they affect thread performance, no blanket waiver of such imperfections can be established. As a guide to acceptance, the most critical considerations are that any corrosion products protruding above the surface of the threads be removed and that no leak path exists. Filing or grinding to remove pits is not permitted.

Imperfections within the above described permissible limits will be permitted under the following conditions:

- a. If imperfections are detected at the mill, the pipe end with imperfections must be the end with the exposed pipe threads. No imperfections detected at the mill are permitted on the coupling end of the pipe.
- b. Imperfections within the above limits are acceptable on the end with the exposed pipe threads. Imperfections running under the coupling, which are detected after shipment from the mill, are not acceptable unless it can be demonstrated that the imperfection is within the above described permissible limit. If the imperfection is within the permissible limits the

*Imperfection. An imperfection is a discontinuity or irregularity in the product detected by methods outlined in the applicable specification.

**Defect. A defect is an imperfection of sufficient magnitude to warrant rejection of the product based on the stipulations of the applicable specification.

coupling may be reapplied and the length of pipe is acceptable product. If the imperfection exceeds permissible limits, it shall be considered a defect and the length of pipe is rejectable, or it may be reconditioned by cutting the threads off, rethreading and reapplying the coupling.

- c. Imperfections that would run under the coupling shall be removed by grinding prior to threading provided the grind is well contoured with the circumference of the pipe and displays a high degree of workmanship. Because of the difficulty in defining acceptable contours and a high degree of workmanship, user discretion shall govern.

NOTE: User discretion applies only to the contour of the grind.

2.3 Threads shall be cut with such precision of form and dimensions and with such finish as to make a tight joint when properly made up power-tight using a high-grade thread compound. On casing and tubing, the thread compound should meet the performance requirements of the latest edition of Bul 5A2 and, additionally for tubing, the joint shall be capable of being made up power-tight and unscrewed four times without injury to the threads by galling. It should not be expected that threaded connections will gage properly after being made up power tight, therefore minor deviations from the specified tolerances should be accepted. Subsequent use of tubing is reviewed in the latest edition of API Recommended Practice 5C1, *Care and Use of Casing and Tubing*. (See 4.6b and c and 4.7 applicable to threads.)

A $\frac{3}{8}$ in. high equilateral triangle die stamp shall be placed at a distance of $L_1 + \frac{1}{16}$ in. from each end of 16, 18 $\frac{1}{2}$ and 20 in. 8-round thread casing in Grades H40, J55 and K55. The base of the triangle stamp will aid in locating the last scratch for basic power-tight makeup of large diameter 8-round thread casing. However, the position of the coupling with respect to the base of the triangle shall not be a basis for acceptance or rejection.

NOTE: A tight joint is one which, when properly made up power-tight using a suitable thread compound, shows no leaks at any pressure up to and including the specified minimum hydrostatic test pressure, or which does not leak longer than 5 minutes at any given pressure, or repeatedly at varying pressures, within the range up to the specified pressure.

2.4 Threads shall be right-hand and shall conform to the dimensions and tolerances specified herein.

NOTE: In the design of round thread casing joints, values for total thread length L_1 are derived from calculations based on providing a theoretical wall thickness at the root of the thread at the end of the pipe as determined by the following formula:

$$t_o = 0.009D + 0.040 \text{ in. (1.02 mm) or } 0.090 \text{ in. (2.29 mm), whichever is greater.}$$

Wherein:

t_o = basic wall thickness at the root of the thread at the end of the pipe, in inches;

D = outside diameter of casing, in inches.

The theoretical wall thickness t_o is related to a basis of joint design only and is not a specification value. It is not subject to measurement or application of tolerances.

2.5 The angle of the outside chamfer at the end of the pipe shall be as shown in Fig. 2.1 and 2.2 and must extend a full 360° around the face of the pipe. The diameter of the chamfer shall be such that the thread root will run out on the chamfer and not on the face of the pipe and will not produce a feather edge.

2.6 Coupling threads shall extend to the center of the coupling. The length of thread in the box end of integral-joint tubing shall not be less than $L_4 + J$ from the end of the box. The threads within the interval from the recess or counterbore to a plane located at distance $J +$ one thread turn from the center of the coupling, or from the small end of the thread in the box of integral-joint tubing, shall conform to the requirements of Sect. 2. The threads in steel couplings for line pipe sizes 2 in. and larger, in all sizes of casing and tubing couplings, and in the box or on the pipe male end of integral-joint tubing shall be zinc or tin electroplated or phosphatized which will minimize galling and develop the maximum leak resistance characteristics of the joint. Where tin, or other ductile coatings in excess of 0.001 in. (0.025 mm) are used, the thread tolerance and standoff apply only to the uncoated threads.* The maximum thickness of electroplated tin coatings shall not exceed 0.006 in. (0.152 mm). Taper, standoff and OD dimensions may be affected by power tight makeup. Deviations from the specified tolerances for these dimensions may be expected after power tight makeup.

2.7 All threads shall be controlled by API certified reference master gages in accordance with the gaging practice requirements in Sect. 3.

2.8 Thread elements for all threads except line pipe threads finer than $11\frac{1}{2}$ threads per inch shall be subject to inspection in accordance with Sect. 6.

NOTE: For line pipe threads finer than $11\frac{1}{2}$ threads per inch (pipe sizes smaller than 1 in. nominal), only the requirements on thread length and stand-off are subject to inspection.

2.9 The maximum misalignment of axis of coupling threads measured in the plane of the coupling face shall not exceed 0.031 in. (0.79 mm) for casing and tubing couplings. The maximum angular misalignment in line pipe couplings sizes 6 in. nominal and larger and in all sizes of couplings for casing and tubing shall not exceed $\frac{3}{4}$ in. per 20 ft (19.05 mm per 6.10 m) of projected axis. Concentricity and alignment tests may be made in accordance with the requirements in Sect. 6. Maximum misalignment of the axis of the pin threads has not been established because of measurement difficulties. Generally, cases of misalignment can be identified by checking whether the minimum length of full crest threads (L_c) is present.

2.10 If so requested by the inspector representing the purchaser, misalignment tests shall be made on one coupling from each lot of 100 couplings or less of each size. If any coupling fails, two additional couplings from the same lot may be tested, both of which must conform with the specified requirements; otherwise, the lot shall be rejected. The manufacturer may elect to test each coupling in the rejected lot.

*In some instances coatings in excess of 0.001 in. (0.025 mm) thickness are being used and accurate gaging is impractical.

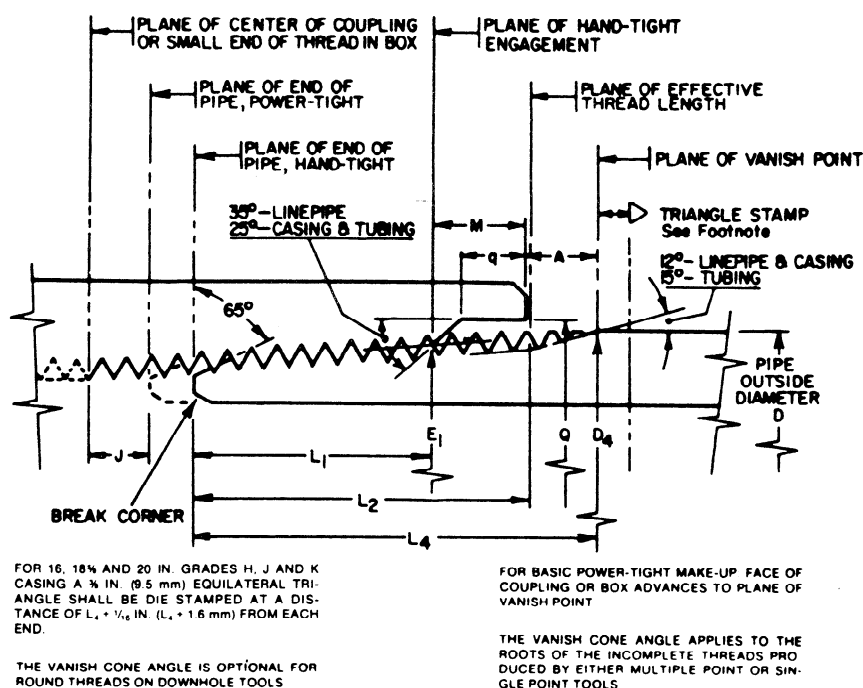


FIG. 2.1
BASIC DIMENSIONS OF LINE-PIPE THREADS AND CASING AND TUBING ROUND THREADS
HAND-TIGHT MAKE-UP

See Tables 2.1 through 2.3 and 2.5 through 2.7 for dimensions.
See Fig. 2.3 and 2.4 and Tables 2.8 and 2.9 for details of thread form.
See Fig. 2.2 for buttress casing threads.
See Sect. 7 for extreme-line casing threads.

2.11 The purchaser shall have the right to reject pipe on which he considers the threads to be out of alignment to a degree which would adversely affect the performance of the pipe.

2.12 The required minimum length of full crest threads is defined by L_c in Tables 2.1 through 2.7.

Threads that are not fully crested have historically been and continue to be referred to as "black crest threads" because the original mill surface has not been removed. The term "black crest thread" is a useful descriptive term; however, it should be pointed out that there can also be non-full crested threads that are not black crested.

TABLE 2.1
LINE-PIPE THREAD DIMENSIONS

All dimensions in inches, except as indicated. See Fig. 2.1.
See Appendix B for metric tables.

1	2	3	4	5	6	7	8	9	10	11	12	13
Size: Nominal	Major Diameter D_4	No. of Threads per Inch	Length: End of Pipe to Hand-Tight Plane L_1	Length: Effective Threads L_2	Total Length: End of Pipe to Vanish Point L_4	Pitch Diameter at Hand- Tight Plane E_1	End of Pipe to Center of Coupling, Power- Tight Make-Up Plane J	Length: Face of Coupling to Hand- Tight Plane M	Diameter of Coupling Recess Q	Depth of Coupling Recess q	Hand- Tight Standoff, Thread Turns A	Minimum Length, Full Crest Threads, From End of Pipe L_c^*
$\frac{1}{8}$	0.405	27	0.1615	0.2639	0.3924	0.37360	0.1389	0.1198	0.468	0.0524	3	-----
$\frac{1}{4}$	0.540	18	0.2278	0.4018	0.5946	0.49163	0.2179	0.2001	0.603	0.1206	3	-----
$\frac{3}{8}$	0.675	18	0.240	0.4078	0.6006	0.62701	0.2119	0.1938	0.738	0.1147	3	-----
$\frac{1}{2}$	0.840	14	0.320	0.5337	0.7815	0.77843	0.2810	0.2473	0.903	0.1582	3	-----
$\frac{3}{4}$	1.050	14	0.339	0.5457	0.7935	0.98887	0.2690	0.2403	1.113	0.1516	3	-----
1	1.315	11½	0.400	0.6828	0.9845	1.23863	0.3280	0.3235	1.378	0.2241	3	0.3325
1¼	1.660	11½	0.420	0.7068	1.0085	1.58338	0.3665	0.3275	1.723	0.2279	3	0.3565
1½	1.900	11½	0.420	0.7235	1.0252	1.82234	0.3498	0.3442	1.963	0.2439	3	0.3732
2	2.375	11½	0.436	0.7565	1.0582	2.29627	0.3793	0.3611	2.469	0.2379	3	0.4062
2½	2.875	8	0.682	1.1375	1.5712	2.76216	0.4913	0.6392	2.969	0.4915	2	0.6342
3	3.500	8	0.766	1.2000	1.6337	3.38850	0.4913	0.6177	3.594	0.4710	2	0.6967
3½	4.000	8	0.821	1.2500	1.6837	3.88881	0.5038	0.6127	4.094	0.4662	2	0.7467
4	4.500	8	0.844	1.3000	1.7337	4.38712	0.5163	0.6397	4.594	0.4920	2	0.7967
5	5.563	8	0.937	1.4063	1.8400	5.44929	0.4725	0.6530	5.657	0.5047	2	0.9030
6	6.625	8	0.958	1.5125	1.9462	6.50597	0.4913	0.7382	6.719	0.5861	2	1.0092
8	8.625	8	1.063	1.7125	2.1462	8.50003	0.4788	0.8332	8.719	0.6768	2	1.2092
10	10.750	8	1.210	1.9250	2.3587	10.62094	0.5163	0.8987	10.844	0.7394	2	1.4217
12	12.750	8	1.360	2.1250	2.5587	12.61781	0.5038	0.9487	12.844	0.7872	2	1.6217
14 D	14.000	8	1.562	2.2500	2.6837	13.87263	0.5038	0.8717	14.094	0.7136	2	1.7467
16 D	16.000	8	1.812	2.4500	2.8837	15.87575	0.4913	0.8217	16.094	0.6658	2	1.9467
18 D	18.000	8	2.000	2.6500	3.0837	17.87500	0.4788	0.8337	18.094	0.6773	2	2.1467
20 D	20.000	8	2.125	2.8500	3.2837	19.87031	0.5288	0.9087	20.094	0.7490	2	2.3467

Included taper on diameter, all sizes, 0.0625 in. per in.

* $L_c = L_4 - 0.652$ in. for 11½ thread line pipe.
 $L_c = L_4 - 0.937$ in. for 8 thread line pipe.

NOTE: Hand tight Standoff "A" is the basic allowance for basic power makeup of the joint as shown in Fig. 2.1. It determines the coupling thread diameter size and does not apply to the pipe thread.

TABLE 2.2
CASING SHORT-THREAD DIMENSIONS
All dimensions in inches, except as indicated. See Fig. 2.1.
See Appendix B for metric tables.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Size: Outside Diameter <i>D</i>	Major Diameter	Nominal Weight: Threads and Coupling, lb. per ft.	No. of Threads Per Inch	Length: End of Pipe to Hand- Tight Plane <i>L₁</i>	Length: Effective Threads <i>L₂</i>	Total Length: End of Pipe to Vanish Point <i>L₄</i>	Pitch Diameter at Hand- Tight Plane <i>E₁</i>	End of Pipe to Center of Coupling, Power- Tight Make-Up <i>J</i>	Length: Face of Coupling to Hand- Tight Plane <i>M</i>	Diameter of Coupling Recess <i>Q</i>	Depth of Coupling Recess <i>q</i>	Hand- Tight Standoff, Thread Turns <i>A</i>	Minimum Length, Full Crest Threads, From End of Pipe <i>Lc*</i>
4½	4.500	9.50	8	0.921	1.715	2.000	4.40337	1.125	0.704	4 19/32	½	3	0.875
4½	4.500	Others	8	1.546	2.340	2.625	4.40337	0.500	0.704	4 19/32	½	3	1.500
5	5.000	11.50	8	1.421	2.215	2.500	4.90337	0.750	0.704	5 3/32	½	3	1.375
5	5.000	Others	8	1.671	2.465	2.750	4.90337	0.500	0.704	5 3/32	½	3	1.625
5½	5.500	All	8	1.796	2.590	2.875	5.40337	0.500	0.704	5 19/32	½	3	1.750
6¾	6.625	All	8	2.046	2.840	3.125	6.52837	0.500	0.704	6 23/32	½	3	2.000
7	7.000	17.00	8	1.296	2.090	2.375	6.90337	1.250	0.704	7 3/32	½	3	1.250
7	7.000	Others	8	2.046	2.840	3.125	6.90337	0.500	0.704	7 3/32	½	3	2.000
7¾	7.625	All	8	2.104	2.965	3.250	7.52418	0.500	0.709	7 23/32	½	3½	2.125
8¾	8.625	24.00	8	1.854	2.715	3.000	8.52418	0.875	0.709	8 23/32	½	3½	1.875
8¾	8.625	Others	8	2.229	3.090	3.375	8.52418	0.500	0.709	8 23/32	½	3½	2.250
9¾	9.625	All	8	2.229	3.090	3.375	9.52418	0.500	0.709	9 23/32	½	3½	2.250(1)
9¾	9.625	All	8	2.162	3.090	3.375	9.51999	0.500	0.713	9 23/32	½	4	2.250(2)
10¾	10.750	32.75	8	1.604	2.465	2.750	10.64918	1.250	0.709	10 27/32	½	3½	1.625(1)
10¾	10.750	Others	8	2.354	3.215	3.500	10.64918	0.500	0.709	10 27/32	½	3½	2.375(1)
10¾	10.750	Other	8	2.287	3.215	3.500	10.64499	0.500	0.713	10 27/32	½	4	2.375(2)
11¾	11.750	All	8	2.354	3.215	3.500	11.64918	0.500	0.709	11 27/32	½	3½	2.375(1)
11¾	11.750	All	8	2.287	3.215	3.500	11.64499	0.500	0.713	11 27/32	½	4	2.375(2)
13¾	13.375	All	8	2.354	3.215	3.500	13.27418	0.500	0.709	13 15/32	½	3½	2.375(1)
13¾	13.375	All	8	2.287	3.215	3.500	13.26999	0.500	0.713	13 15/32	½	4	2.375(2)
16	16.000	All	8	2.854	3.715	4.000	15.89918	0.500	0.709	16 3/32	½	3½	2.875
18¾	18.625	87.50	8	2.854	3.715	4.000	18.52418	0.500	0.709	18 23/32	½	3½	2.875
20	20.000	All	8	2.854	3.715	4.000	19.89918	0.500	0.709	20 3/32	½	3½	2.875(3)
20	20.000	All	8	2.787	3.715	4.000	19.89499	0.500	0.713	20 3/32	½	4	2.875(4)

Included taper on diameter, all sizes, 0.0625 in. per in.

**Lc* = *L₄* - 1.125 in. for 8 Round Thread Casing.

NOTE: Hand tight Standoff "A" is the basic allowance for basic power makeup of the joint as shown in Fig. 2.1. It determines the coupling thread diameter size and does not apply to the pipe thread.

(1) Applicable to coupling grades lower than P-110.

(3) Applicable to coupling grades lower than J-55 and K-55.

(2) Applicable to coupling grades P-110 and higher.

(4) Applicable to coupling grades J-55 and K-55 and higher.

TABLE 2.3
CASING LONG-THREAD DIMENSIONS
All dimensions in inches, except as indicated. See Fig. 2.1.
See Appendix B for metric tables.

1	2	3	4	5	6	7	8	9	10	11	12	13
Size: Outside Diameter <i>D</i>	Major Diameter <i>D₄</i>	No. of Threads Per Inch	Length: End of Pipe to Hand- Tight Plane <i>L₁</i>	Length: Effective Threads <i>L₂</i>	Total Length: End of Pipe to Vanish Point <i>L₄</i>	Pitch Diameter at Hand- Tight Plane <i>E₁</i>	End of Pipe to Center of Coupling, Power- Tight Make-Up <i>J</i>	Length: Face of Coupling to Hand- Tight Plane <i>M</i>	Diameter of Coupling Recess <i>Q</i>	Depth of Coupling Recess <i>q</i>	Hand-Tight Standoff, Thread Turns <i>A</i>	Minimum Length, Full Crest Threads, From End of Pipe <i>Lc*</i>
4½	4.500	8	1.921	2.715	3.000	4.40337	0.500	0.704	4 19/32	½	3	1.875
5	5.000	8	2.296	3.090	3.375	4.90337	0.500	0.704	5 3/32	½	3	2.250
5½	5.500	8	2.421	3.215	3.500	5.40337	0.500	0.704	5 19/32	½	3	2.375
6¾	6.625	8	2.796	3.590	3.875	6.52837	0.500	0.704	6 23/32	½	3	2.750
7	7.000	8	2.921	3.715	4.000	6.90337	0.500	0.704	7 3/32	½	3	2.875
7¾	7.625	8	2.979	3.840	4.125	7.52418	0.500	0.709	7 23/32	½	3½	3.000
8¾	8.625	8	3.354	4.215	4.500	8.52418	0.500	0.709	8 23/32	½	3½	3.375
9¾	9.625	8	3.604	4.465	4.750	9.52418	0.500	0.709	9 23/32	½	3½	3.625(1)
9¾	9.625	8	3.537	4.465	4.750	9.51999	0.500	0.713	9 23/32	½	4	3.625(2)
20	20.00	8	4.104	4.965	5.250	19.89918	0.500	0.709	20 3/32	½	3½	4.125(3)
20	20.00	8	4.037	4.965	5.250	19.89499	0.500	0.713	20 3/32	½	4	4.125(4)

Included taper on diameter, all sizes, 0.0625 in. per in.

**Lc* = *L* - 1.125 in for 8 Round Thread Casing.

NOTE: Hand tight Standoff "A" is the basic allowance for basic power makeup of the joint as shown in Fig. 2.1. It determines the coupling thread diameter size and does not apply to the pipe thread.

(1) Applicable to coupling grades lower than P-110.

(3) Applicable to coupling grades lower than J-55 and K-55

(2) Applicable to coupling grades P-110 and higher.

(4) Applicable to coupling grades J-55 and K-55 and higher.

TABLE 2.4
BUTTRESS CASING THREAD DIMENSIONS
 All dimensions in inches, except as indicated. See Fig. 2.2. See Appendix B for metric tables.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Size: Outside Diameter D	Major Diameter D_1	No. of Threads Per Inch g	Length: Imperfect Threads L_7	Length: Perfect Threads L_7	Total Length: End of Pipe to Vanish Point L_4	Pitch Diameter ¹ E_7	End of Pipe to Center of Coupling, Power- Tight Make-Up J	End of Pipe to Center of Coupling, Hand- Tight Make-Up J_h	Length: Face of Coupling to Plane E ₇	Length: End of Pipe to Triangle Stamp A_1	Hand- Tight Standoff, Thread Turns A	Diameter of Counterbore in Coupling Q	Minimum Length, Full Crest Threads From End of Pipe L_c^*
4½	4.516	5	1.984	1.6535	3.6375	4.454	0.500	0.900	1.884	3½	½	4.640	1.2535
5	5.016	5	1.984	1.7785	3.7625	4.954	0.500	1.000	1.784	4½	1	5.140	1.3785
5½	5.516	5	1.984	1.8410	3.8250	5.454	0.500	1.000	1.784	4½	1	5.640	1.4410
6%	6.641	5	1.984	2.0285	4.0125	6.579	0.500	1.000	1.784	4½	1	6.765	1.6285
7	7.016	5	1.984	2.2160	4.2000	6.954	0.500	1.000	1.784	4½	1	7.140	1.8160
7%	7.641	5	1.984	2.4035	4.3875	7.579	0.500	1.000	1.784	4½	1	7.765	2.0035
8%	8.641	5	1.984	2.5285	4.5125	8.579	0.500	1.000	1.784	4½	1	8.765	2.1285
9%	9.641	5	1.984	2.5285	4.5125	9.579	0.500	1.000	1.784	4½	1	9.765	2.1285
10%	10.766	5	1.984	2.5285	4.5125	10.704	0.500	1.000	1.784	4½	1	10.890	2.1285
11%	11.766	5	1.984	2.5285	4.5125	11.704	0.500	1.000	1.784	4½	1	11.890	2.1285
13%	13.391	5	1.984	2.5285	4.5125	13.329	0.500	1.000	1.784	4½	1	13.515	2.1285
16	16.000	5	1.488	3.1245	4.6125	15.938	0.500	0.875	1.313	4½	¾	16.154	2.7245
18%	18.625	5	1.488	3.1245	4.6125	18.563	0.500	0.875	1.313	4½	¾	18.779	2.7245
20	20.000	5	1.488	3.1245	4.6125	19.938	0.500	0.875	1.313	4½	¾	20.154	2.7245

Included taper on diameter: Sizes 13% in. and smaller — 0.0625 in. per in.
 Sizes 16 in. and larger — 0.0833 in. per in.

NOTES: 1. At plane of perfect thread length L_7 , the basic major diameter of the pipe thread and plug gage thread is 0.016 in. greater than nominal pipe diameter D for sizes 13% in. and smaller, and is equal to the nominal pipe diameter for sizes 16 in. and larger.

2. Hand tight Standoff "A" is the basic allowance for basic power makeup of the joint as shown in Fig. 2.2. It determines the coupling thread diameter size and does not apply to the pipe thread. The triangle stamp located on the pipe at the length A_1 from the end of the pipe facilitates obtaining the power makeup provided for by Hand tight Standoff "A".

¹Pitch diameter on buttress casing thread is defined as being midway between the major and minor diameters.

* $L_c = L_7 - 0.400$ in. for buttress thread casing. Within the L_c length, as many as 2 threads showing the original outside surface of the pipe on their crests for a circumferential distance not exceeding 25% of the pipe circumference is permissible. The remaining threads in the L_c thread length shall be full crested threads.

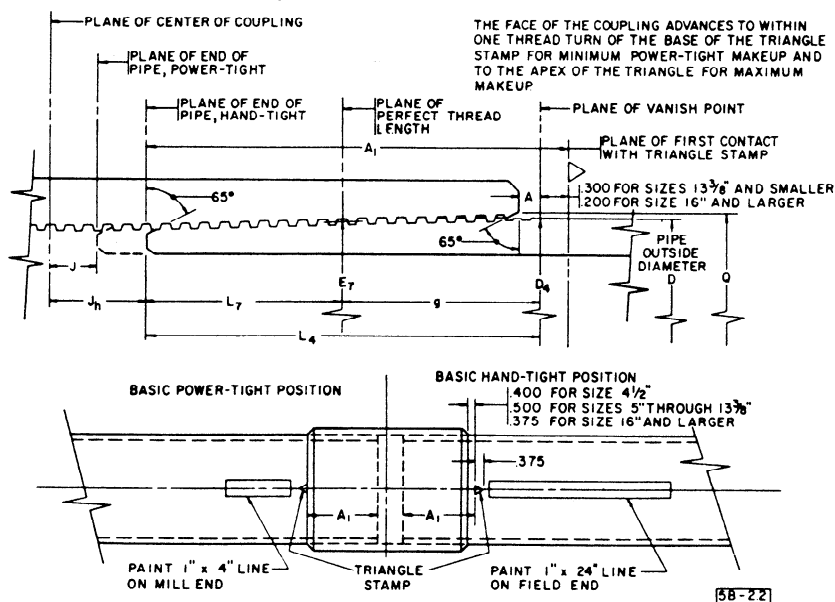


FIG. 2.2
BASIC DIMENSIONS OF BUTTRESS CASING THREADS
HAND-TIGHT MAKE-UP

See Appendix B for metric dimensions.
 See Fig. 2.5 for detail of thread form and dimensions.
 See Fig. 2.1 for line-pipe threads and casing and tubing round threads.
 See Sect. 7 for extreme-line casing threads.

TABLE 2.5
NON-UPSET TUBING THREAD DIMENSIONS
 All dimensions in inches, except as indicated. See Fig. 2.1.
 See Appendix B for metric tables.

1	2	3	4	5	6	7	8	9	10	11	12	13
Size: Outside Diameter <i>D</i>	Major Diameter <i>D₄</i>	No. of Threads Per Inch	Length: End of Pipe to Hand- Tight Plane <i>L₁</i>	Length: Effective Threads <i>L₂</i>	Total Length: End of Pipe to Vanish Point <i>L₄</i>	Pitch Diameter at Hand- Tight Plane <i>E₁</i>	End of Pipe to Center of Coupling, Power- Tight Make-Up <i>J</i>	Length: Face of Coupling to Hand- Tight Plane <i>M</i>	Diameter of Coupling Recess <i>Q</i>	Depth of Coupling Recess <i>q</i>	Hand- Tight Standoff, Thread Turns <i>A</i>	Minimum Length, Full Crest Threads, From End of Pipe <i>L_c*</i>
1.050	1.050	10	0.448	0.925	1.094	0.98826	0.500	0.446	1.113	$\frac{1}{8}$	2	0.300
1.315	1.315	10	0.479	0.956	1.125	1.25328	0.500	0.446	1.378	$\frac{1}{8}$	2	0.300
1.660	1.660	10	0.604	1.081	1.250	1.59826	0.500	0.446	1.723	$\frac{1}{8}$	2	0.350
1.900	1.900	10	0.729	1.206	1.375	1.83826	0.500	0.446	1.963	$\frac{1}{8}$	2	0.475
2 $\frac{3}{8}$	2.375	10	0.979	1.456	1.625	2.31326	0.500	0.446	2.438	$\frac{1}{8}$	2	0.725
2 $\frac{7}{8}$	2.875	10	1.417	1.894	2.063	2.81326	0.500	0.446	2.938	$\frac{1}{8}$	2	1.163
3 $\frac{1}{2}$	3.500	10	1.667	2.144	2.313	3.43826	0.500	0.446	3.563	$\frac{1}{8}$	2	1.413
4	4.000	8	1.591	2.140	2.375	3.91395	0.500	0.534	4.063	$\frac{3}{8}$	2	1.375
4 $\frac{1}{2}$	4.500	8	1.779	2.328	2.563	4.41395	0.500	0.534	4.563	$\frac{3}{8}$	2	1.563

Included taper on diameter, all sizes, 0.0625 in. per in.

**L_c* = *L₄* - 0.900 in. for 10 thread tubing, but not less than 0.300 in.

L_c = *L₄* - 1.000 in. for 8 thread tubing.

NOTE: Hand tight Standoff "A" is the basic allowance for basic power makeup of the joint as shown in Fig. 2.1. It determines the coupling thread diameter size and does not apply to the pipe thread.

TABLE 2.6
EXTERNAL-UPSET TUBING THREAD DIMENSIONS
 All dimensions in inches, except as indicated. See Fig. 2.1.
 See Appendix B for metric tables.

1	2	3	4	5	6	7	8	9	10	11	12	13
Size: Outside Diameter <i>D</i>	Major Diameter <i>D₄</i>	No. of Threads Per Inch	Length: End of Pipe to Hand- Tight Plane <i>L₁</i>	Length: Effective Threads <i>L₂</i>	Total Length: End of Pipe to Vanish Point <i>L₄</i>	Pitch Diameter at Hand- Tight Plane <i>E₁</i>	End of Pipe to Center of Coupling, Power- Tight Make-Up <i>J</i>	Length: Face of Coupling to Hand- Tight Plane <i>M</i>	Diameter of Coupling Recess <i>Q</i>	Depth of Coupling Recess <i>q</i>	Hand- Tight Standoff, Thread Turns <i>A</i>	Minimum Length, Full Crest Threads, From End of Pipe <i>L_c*</i>
1.050	1.315	10	0.479	0.956	1.125	1.25328	0.500	0.446	1.378	$\frac{1}{8}$	2	0.300
1.315	1.469	10	0.604	1.081	1.250	1.40706	0.500	0.446	1.531	$\frac{1}{8}$	2	0.350
1.660	1.812	10	0.729	1.206	1.375	1.75079	0.500	0.446	1.875	$\frac{1}{8}$	2	0.475
1.900	2.094	10	0.792	1.269	1.438	2.03206	0.500	0.446	2.156	$\frac{1}{8}$	2	0.538
2 $\frac{3}{8}$	2.594	8	1.154	1.703	1.938	2.50775	0.500	0.534	2.656	$\frac{3}{8}$	2	0.938
2 $\frac{7}{8}$	3.094	8	1.341	1.890	2.125	3.00775	0.500	0.534	3.156	$\frac{3}{8}$	2	1.125
3 $\frac{1}{2}$	3.750	8	1.591	2.140	2.375	3.66395	0.500	0.534	3.813	$\frac{3}{8}$	2	1.375
4	4.250	8	1.716	2.265	2.500	4.16395	0.500	0.534	4.313	$\frac{3}{8}$	2	1.500
4 $\frac{1}{2}$	4.750	8	1.841	2.390	2.625	4.66395	0.500	0.534	4.813	$\frac{3}{8}$	2	1.625

Included taper on diameter, all sizes, 0.0625 in. per in.

**L_c* = *L₄* - 0.900 in. for 10 thread tubing, but not less than 0.300 in.

**L_c* = *L₄* - 1.000 in. for 8 thread tubing.

NOTE: Hand tight Standoff "A" is the basic allowance for basic power makeup of the joint as shown in Fig. 2.1. It determines the coupling thread diameter size and does not apply to the pipe thread.

TABLE 2.6a
EXTERNAL-UPSET TUBING LONG THREAD DIMENSIONS
FOR REINFORCED THERMOSETTING RESIN TUBING

All dimensions in inches, except as indicated. See Fig. 2.1.
See Appendix B for metric tables.

1	2	3	4	5	6	7	8	9	10	11	12	13
Size Outside Diameter D	Major Diameter D_4	No. of Threads Per Inch	Length: End of Pipe to Hand- Tight Plane L_1	Length: Effective Threads L_2	Total Length: End of Pipe to Vanish Point L_4	Pitch Diameter at Hand- Tight Plane E_1	End of Pipe to Center of Coupling, Power- Tight Make-up J	Length: Face of Coupling to Hand- Tight Plane M	Diameter of Coupling Recess Q	Depth of Coupling Recess q	Hand- Tight Standoff, Thread Turns A	Minimum Length, Full Crest Threads, From end of Pipe L_c^*
1.050	1.315	10	0.979	1.456	1.625	1.25328	0.500	0.446	1.378	$\frac{1}{8}$	2	0.725
1.315	1.469	10	1.104	1.581	1.750	1.40706	0.500	0.446	1.531	$\frac{1}{8}$	2	0.850
1.660	1.812	10	1.229	1.706	1.875	1.75079	0.500	0.446	1.875	$\frac{1}{8}$	2	0.975
1.900	2.094	10	1.417	1.894	2.063	2.03206	0.500	0.446	2.156	$\frac{1}{8}$	2	1.163
2 $\frac{3}{8}$	2.594	8	1.779	2.328	2.563	2.50775	0.500	0.534	2.656	$\frac{3}{8}$	2	1.563
2 $\frac{7}{8}$	3.094	8	2.091	2.640	2.875	3.00775	0.500	0.534	3.156	$\frac{3}{8}$	2	1.875
3 $\frac{1}{2}$	3.750	8	2.341	2.890	3.125	3.66395	0.500	0.534	3.813	$\frac{3}{8}$	2	2.125
4	4.250	8	2.591	3.140	3.375	4.16395	0.500	0.534	4.313	$\frac{3}{8}$	2	2.375
4 $\frac{1}{2}$	4.750	8	2.716	3.265	3.500	4.66395	0.500	0.534	4.813	$\frac{3}{8}$	2	2.500

Included taper on diameter, all sizes, 0.0625 in. per in.

* $L_c = L_4 - 0.900$ in. for 10 thread tubing.
 $L_c = L_4 - 1.000$ in. for 8 thread tubing.

NOTE: Hand tight Standoff "A" is the basic allowance for basic power makeup of the joint as shown in Fig. 2.1. It determines the coupling thread diameter size and does not apply to the pipe thread.

TABLE 2.7
INTEGRAL-JOINT TUBING THREAD DIMENSIONS
All dimensions in inches, except as indicated. See Fig. 2.1.
See Appendix B for metric tables.

1	2	3	4	5	6	7	8	9	10	11	12	13
Size: Outside Diameter D	Major Diameter D_4	No. of Threads Per Inch	Length: End of Pipe to Hand- Tight Plane L_1	Length: Effective Threads L_2	Total Length: End of Pipe to Vanish Point L_4	Pitch Diameter at Hand- Tight Plane E_1	End of Pipe to Thread Run-out in Box Power- Tight Make-Up J	Length: Face of Box to Hand- Tight Plane M	Diameter of Box Recess Q	Depth of Box Recess q	Hand- Tight Standoff, Thread Turns A	Minimum Length, Full Crest Threads, From End of Pipe L_c^*
1.315	1.315	10	.479	.956	1.125	1.25328	0.500	0.446	1.378	$\frac{1}{8}$	2	0.225
1.660	1.660	10	.604	1.081	1.250	1.59826	0.500	0.446	1.723	$\frac{1}{8}$	2	0.350
1.900	1.900	10	.729	1.206	1.375	1.83826	0.500	0.446	1.963	$\frac{1}{8}$	2	0.475
2.063	2.094	10	.792	1.269	1.438	2.03206	0.500	0.446	2.156	$\frac{1}{8}$	2	0.538

Included taper on diameter, all sizes, 0.0625 in. per in.

* $L_c = L_4 - 0.900$ in. for 10 thread tubing.

NOTE: Hand tight Standoff "A" is the basic allowance for basic power makeup of the joint as shown in Fig. 2.1. It determines the coupling thread diameter size and does not apply to the pipe thread.

TABLE 2.8

LINE-PIPE THREAD HEIGHT DIMENSIONS

All dimensions in inches. See Fig. 2.3
See Appendix B for metric tables.

Thread Element	1	2	3	4	5	6
	27 Threads Per Inch $p=0.0370$	18 Threads Per Inch $p=0.0556$	14 Threads Per Inch $p=0.0714$	11 1/4 Threads Per Inch $p=0.0870$	8 Threads Per Inch $p=0.1250$	
$H=$	$0.866p$	0.0321	0.0481	0.0619	0.0753	0.1082
$h_s=h_n=$	$0.760p$	0.0281	0.0422	0.0543	0.0661	0.0950
$f_{rs}=f_{rn}=$	$0.033p$	0.0012	0.0018	0.0024	0.0029	0.0041
$f_{cs}=f_{cn}=$	$0.073p$	0.0027	0.0041	0.0052	0.0063	0.0091

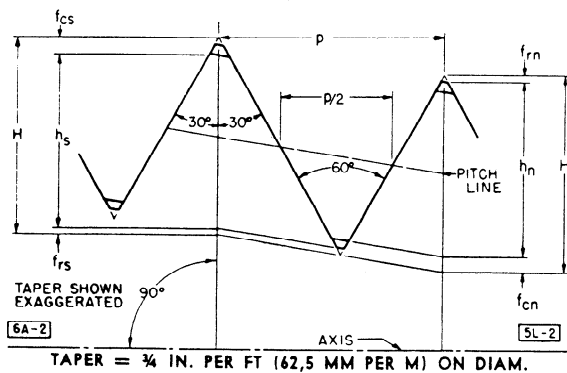


FIG. 2.3

LINE-PIPE THREAD FORM

See Table 2.8 for dimensions.

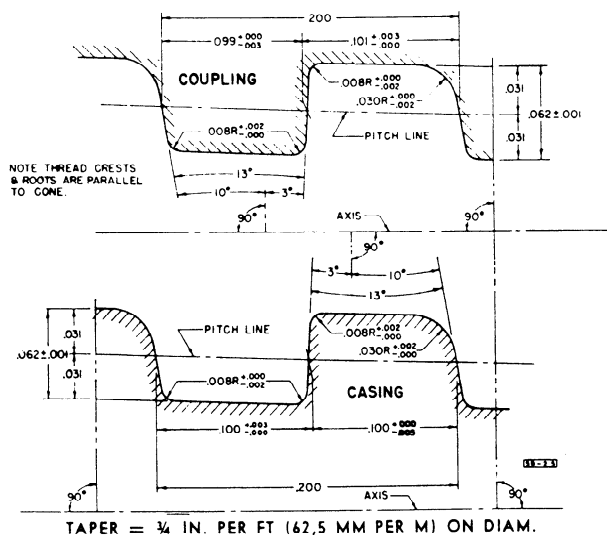


FIG. 2.5

BUTTRESS CASING THREAD FORM AND DIMENSIONS

For casing sizes 4 1/2 through 13 3/4 in.
See Appendix B for metric dimensions.

TABLE 2.9

CASING AND TUBING ROUND THREAD HEIGHT DIMENSIONS

All dimensions in inches. See Fig. 2.4
See Appendix B for metric tables.

Thread Element	1	2	3
	10 Threads per Inch, $p = 0.1000$	8 Threads per Inch, $p = 0.1250$	
$H=$	$0.866p$	0.08660	0.10825
$h_s=h_n=$	$0.626p-0.007$	0.05560	0.07125
$s_{rs}=s_{rn}=$	$0.120p+0.002$	0.01400	0.01700
$s_{cs}=s_{cn}=$	$0.120p+0.005$	0.01700	0.02000

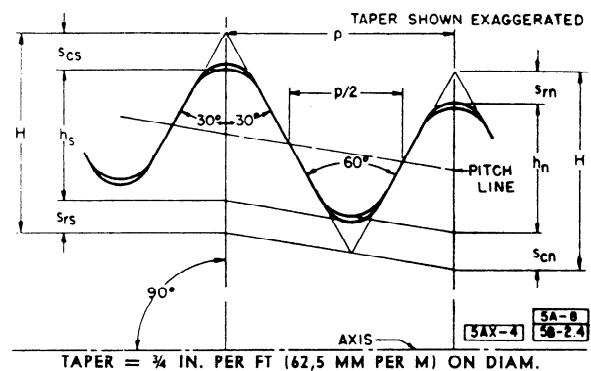


FIG. 2.4

CASING AND TUBING ROUND THREAD FORM

See Table 2.9 for dimensions.

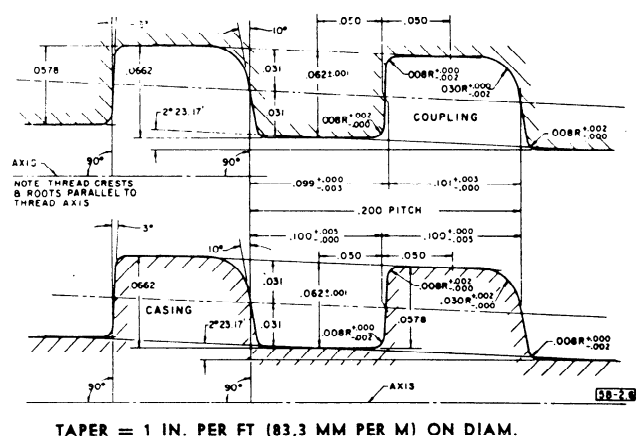


FIG. 2.6

BUTTRESS CASING THREAD FORM AND DIMENSIONS

For sizes 16-in. and larger
See Appendix B for metric dimensions.

TABLE 2.10
TOLERANCES ON LINE-PIPE THREAD AND
CASING AND TUBING ROUND-THREAD
DIMENSIONS³

See Table 2.11 for tolerances on buttress casing thread dimensions.

See Appendix B for metric tables.

Element	Tolerance
Taper, per foot on diameter:⁴	
Line pipe, casing, non-upset tubing and regular thread external-upset tubing.....	+0.0625 in. —0.0312 in.
Long thread external-upset tubing ⁵	+0.0300 in. —0.0180 in.
Lead:^{1,4}	
Per inch:	
Line pipe, casing, non-upset tubing and regular thread external-upset tubing.....	±0.003 in.
Long thread external-upset tubing ⁵	±0.002 in.
Cumulative:	
Line pipe, casing, non-upset tubing and regular thread external-upset tubing.....	±0.006 in.
Long thread external-upset tubing ⁵	±0.003 in.
Height, h_s and h_n:⁴	
Line pipe.....	+0.002 in. —0.006 in.
Casing, non-upset tubing and regular thread external-upset tubing.....	+0.002 in. —0.004 in.
Long thread external-upset tubing ⁵	±0.001 in.
Angle, included ⁴	±1½ deg.
Length, L_4 (external thread):²	
Line pipe.....	±1p
Casing.....	±1p
Tubing	
8-thread.....	±1p
10-thread	
External-upset.....	+1½p —¾p
Non-upset.....	±1½p
Chamfer:⁴	
On outside end of threaded pipe.....	+5 deg. —0 deg.
Standoff A.....	See Par. 3.4

Footnotes to Table 2.10

¹For pipe (external threads) the lead tolerance per inch is the maximum allowable error in any inch within the length $L_4 - g$. See Sect. 4 for g dimensions. The cumulative lead tolerance is the maximum allowable error over the entire length $L_4 - g$. For internal threads, lead measurements shall be made within the length from the counterbore to a plane located at a distance $J +$ one thread turn from the center of the coupling or from the small end of the thread in the box of integral joint tubing.

² L_4 is acceptable: a, if the distance from the end of the pipe to the vanish plane (at the point where the outside diameter of the pipe is a maximum) is within the above minus tolerance; or b, if the distance from the end of the pipe to the vanish plane (where the outside diameter of the pipe is a minimum) is within the above plus tolerance.

³Tolerances apply to both external and internal threads except where otherwise indicated.

⁴Not applicable to line pipe in sizes smaller than 1 in.

⁵Tolerances for long thread external-upset tubing are applicable only to reinforced thermosetting resin tubing. See Table 2.6a.

TABLE 2.11
TOLERANCES ON BUTTRESS CASING THREAD
DIMENSIONS³

See Appendix B for metric tables.

Element	Tolerance
Taper, per foot on diameter:	
Coupling (maximum engaged length).....	+0.054 in. —0.030 in.
Pipe:	
In perfect thread length.....	+0.042 in. —0.018 in.
In imperfect thread length ¹	+0.054 in. —0.018 in.
Lead:²	
Per inch:	
13⁄16 in. and smaller.....	±0.002 in.
16 in. and larger.....	±0.003 in.
Cumulative.....	±0.004 in.
Angle, Included.....	±1 deg.
Length, L_4 (external thread):	
Tolerance not specified because of type of thread.	
Chamfer:	
On outside end of threaded pipe.....	+5 deg. —0 deg.
Standoff A.....	See Par. 3.4

¹Taper of the thread root (or "minor") cone should not increase over the maximum tolerance at the point of intersection with the pipe outside diameter.

²The lead tolerance per inch is the maximum allowable error in any inch within the perfect thread length. The cumulative tolerance is the maximum allowable error over the full perfect thread length. The perfect thread length for pipe (external) threads shall be taken as the length from the end of the pipe to the plane $L_4 - g$, and for coupling threads shall be taken as the length from the coupling counterbore to a plane located at a distance $J +$ one thread turn from the center of the coupling.

³Tolerances apply to both external and internal threads except where otherwise indicated.

SECTION 3

GAGING PRACTICE

LINE PIPE, ROUND-THREAD CASING AND TUBING, AND BUTTRESS THREAD CASING

3.1 All threads covered by this section shall comply with the gaging practice requirements specified herein. Accordingly, any manufacturer who is authorized to apply the API monogram, or desires to apply the letters API, to products utilizing any of the threads covered by this specification shall own reference master gages for each size and type of thread produced on products marked with the monogram. Reference master gages consist of a plug and mating ring conforming to the requirements of Sect. 4, and certified as required in Section 5.

NOTE 1: Gages made under Std 5A, 5AX or 5L prior to 1962 may be used provided proper allowance is made for deviations from the requirements of Sect. 4. See Par. 3.9 regarding line-pipe gages made prior to 1940.

NOTE 2: The use of reference master gages in checking product threads should be minimized. Such use should be confined to cases of dispute which cannot be settled by rechecking the working gage against the reference master. Good care should be exercised when the reference master gage is assembled on a product thread.

NOTE 3: It is not necessary that authority to use the API monogram on pipe be obtained in order to purchase certified API reference master gages, but the purchaser of such gages must comply with all the stipulations on certification and retest as given in this specification.

NOTE 4: Reference master buttress thread casing gages in sizes 13½ in. and smaller made prior to 1962 are acceptable without certification provided the standoff has not changed more than the permissible amount shown in Par. 3.6. Buttress gages in sizes 16 in. and larger made prior to June 1, 1968 to the dimensions shown in the U.S. Steel Corporation Drawing DS-416-1 dated February 27, 1967 are satisfactory for continued use and certification is permitted.

3.2 The manufacturer shall also provide working gages conforming to the requirements of Sect. 4 for use in gaging the product threads, and shall maintain all working gages in such condition as to insure that product threads gaged as required herein, are acceptable under this specification. Cleanliness of product and gage is imperative for satisfactory gaging of product.

3.3 The relationship between reference master gages, working gages, and product threads shall be as shown in Fig. 3.1 and 3.2, wherein the certified reference master plug gage is shown as the standard and the certified reference master ring gage as the transfer standard. The standoff value S of certified reference master gages is the distance from the plane of vanish point on the master plug gage to the face

of the master ring gage. The standoff value P of certified reference master gages is the difference between the tabulated L_4 dimension and the distance from the plane of vanish point on the master plug gage to the small end of the master ring gage. The certified reference master ring gage is used to establish the standoff value S_1 of the working plug gage. The certified reference master plug gage is used to establish the standoff value P_1 of the working ring gage.

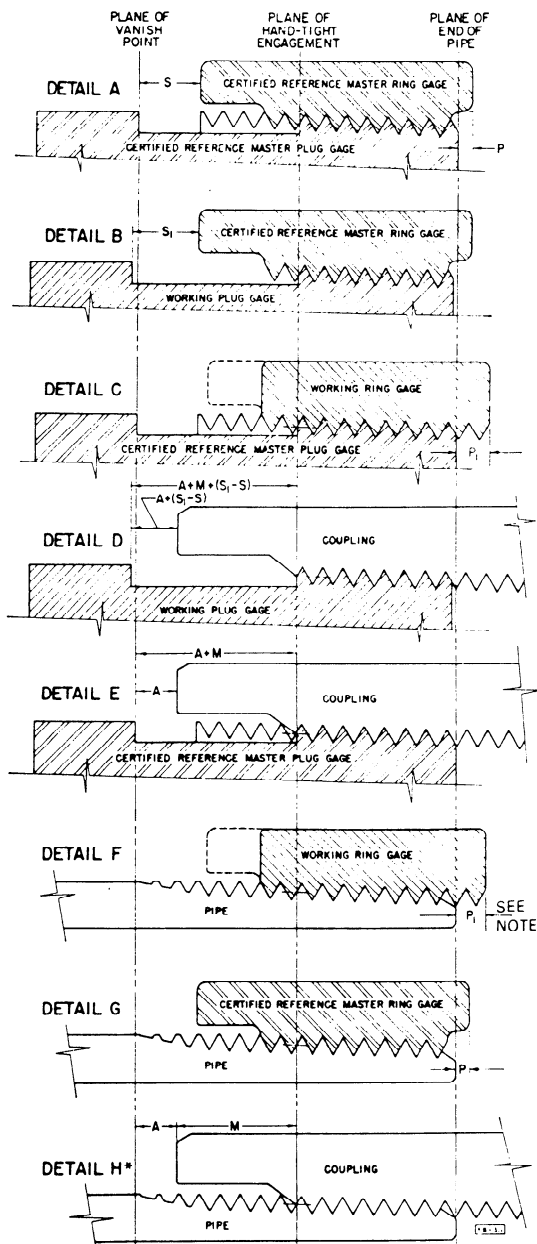
NOTE: The mating standoff of the reference master ring gage against the reference master plug gage as marked on the ring gage, is intended primarily as the basis for establishing the limits of wear or secular change in the gages. Deviation from this initial S value should be taken into account in establishing working gage standoff values.

3.4 Tolerance on standoffs P and P_1 of the ring gage against the end of the pipe, and on standoff A and $A + (S_1 - S)$ of the plug gage against the face of the coupling or box, shall be as follows:

	Tolerance	
	P and P_1	A and $A + (S_1 - S)$
Line pipe		
All sizes	$\pm 1p$	$\pm 1p$
8 threads per inch		
Round thread casing and		
tubing	$\pm 1p$	$\pm 1p$
10 threads per inch		
Round thread tubing	$\pm 1\frac{1}{2}p$	$\pm 1\frac{1}{2}p$
Buttress casing	$+ \frac{1}{2}p$ $- 0$	$+ 0$ $- \frac{1}{2}p$

NOTE: The requirements given herein for line-pipe and round-thread gages do not include mandatory provisions for a gaging notch. Therefore, the length $A + M + (S_1 - S)$ cannot be measured readily with these gages (see Detail D, Fig. 3.1). This length may be measured by providing a suitable notch on the working plug gage located at the Distance L_1 from the end-of-pipe plane (see Fig. 4.1).

3.5 The maintenance of reference master gages within the standoff limits specified in Par. 3.6 shall be the responsibility of the gage user. Gages shall be periodically tested for mating standoff by the procedure stipulated in Par. 5.4, the interval between tests being dependent on the frequency of their use. The API monogram shall not be applied on products controlled by gages which have not been so tested, nor shall the letters API be used for identification of any pipe threads unless these requirements have been met.

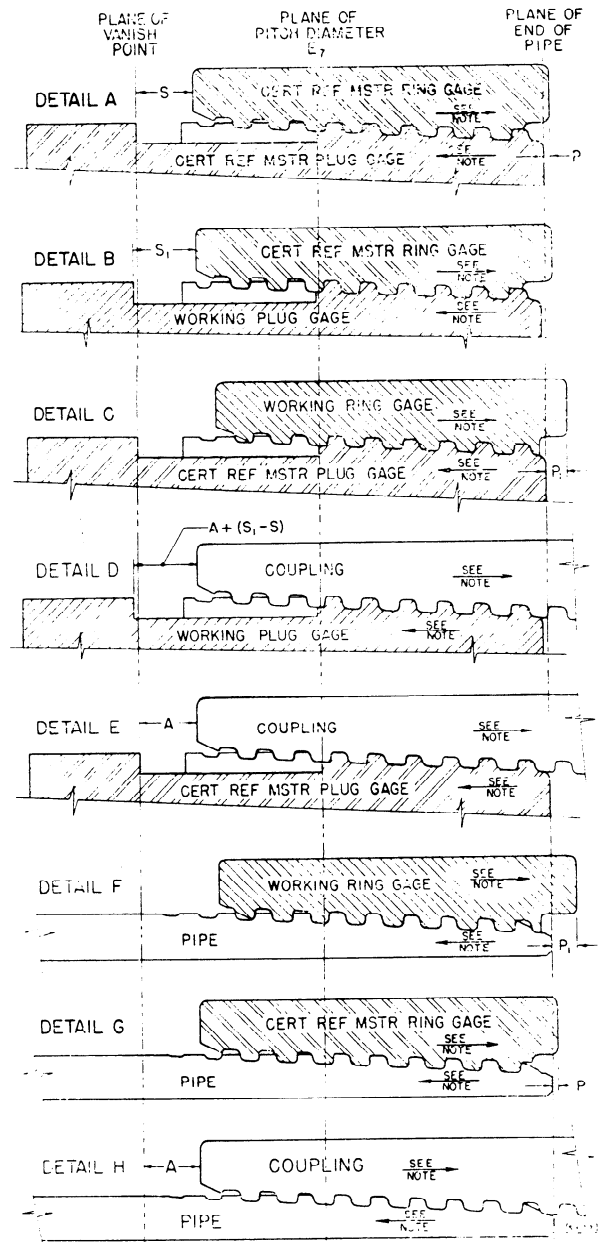


*Detail H is a nominal design illustration and the tolerances given in Par. 3.4 are not applicable to the standoff of coupling on pipe.

NOTE: WHEN CHECKING LONG THREAD CASING WITH SHORT THREAD RING GAGES THE END OF THE PIPE WILL EXTEND BEYOND THE SMALL END OF THE RING GAGE BY AN AMOUNT EQUAL TO $(L_1 \text{ LONG} - L_1 \text{ SHORT}) - P_1$.

FIG. 3.1

GAGING PRACTICE FOR LINE-PIPE THREADS AND CASING AND TUBING ROUND-THREADS HAND-TIGHT ASSEMBLY



NOTE: TO OBTAIN CORRECT STANDOFF ON 16 IN. AND LARGER BUTTRESS CASING THREAD GAGES, THE GAGES SHOULD BE ADVANCED AXIALLY WITH BACK PRESSURE IN DIRECTION OF ARROWS SO THAT ALL CLEARANCE IS REMOVED BETWEEN THE MAKE-UP FLANKS OF THREADS.

FIG. 3.2

GAGING PRACTICE FOR BUTTRESS CASING THREADS HAND-TIGHT ASSEMBLY

3.6 A pair of gages (reference master plug and mating reference master ring) which have been tested as prescribed in Par. 5.4 may be considered safe for continued use provided the mating standoff remains equal to the original certified standoff S (as stamped on the ring gage), or does not change from this original value more than that shown below.

- a. For line-pipe gages the mating standoff shall not increase from the original S value by more than the equivalent of $1/10$ thread turn for all pitches and sizes, and shall not decrease from this original value by more than $1/8$ thread turn for 27-thread and 18-thread (per inch) gages, $1/4$ thread turn for 14-thread and $11\frac{1}{2}$ -thread gages, or $3/8$ thread turn for 8-thread gages for line pipe in sizes 8-in. nominal and smaller, and $1/5$ thread turn for 8-thread gages for line pipe in sizes 10-in. nominal and larger.
- b. For round-thread casing and tubing gages the mating standoff shall not increase from the original S value by more than the equivalent of $1/10$ thread turn for all pitches and sizes and shall not decrease from this original value for 8-thread gages by more than $1/4$ thread turn for sizes $8\frac{1}{8}$ in. and smaller, $1/5$ thread turn for sizes $9\frac{1}{8}$ in. and larger, and $1/5$ thread turn for all 10-thread gages.
- c. For buttress-thread casing gages the mating standoff shall not increase from the original S value by more than the equivalent of $1/8$ thread turn for all sizes and shall not decrease from this original value by more than $1/10$ thread turn for sizes $8\frac{1}{8}$ in. and smaller, and $1/8$ thread turn for sizes $9\frac{1}{8}$ in. and larger.

NOTE: The standoff in thread turns is converted to axial standoff by dividing the fractional turn by the number of threads per inch, or by multiplying the fractional turn by the pitch. The tolerances on standoff as given above in turns are equivalent to the following axial tolerances:

Number of Threads Per Inch	Axial Tolerance	
	in.	mm
Line-pipe Gages		
27	+0.0037 -0.0046	+0.094 -0.117
18	+0.0056 -0.0070	+0.142 -0.178
14	+0.0071 -0.0112	+0.180 -0.284
11½	+0.0087 -0.0136	+0.221 -0.345
8 (Pipe sizes 8-in. nominal and smaller)	+0.0125 -0.0195	+0.318 -0.495
8 (Pipe sizes 10-in. nominal and larger)	+0.0125 -0.0250	+0.315 -0.635
Round-thread casing and tubing gages		
10	+0.0100 -0.0200	+0.254 -0.508
8 (pipe sizes 8½ in. and smaller)	+0.0125 -0.0195	+0.318 -0.495
8 (pipe sizes 9½ in. and larger)	+0.0125 -0.0250	+0.318 -0.635
Buttress-thread casing gages		
5 (pipe sizes 8½ in. and smaller)	+0.0125 -0.0200	+0.318 -0.508
5 (pipe sizes 9½ in. and larger)	+0.0125 -0.0250	+0.318 -0.635

3.7 A pair of reference master gages showing at any time an increase or decrease in S value greater or less than given in Par. 3.6 should be reconditioned.

NOTE: An increase in standoff usually indicates the presence of burrs, rough threads, some foreign substance, or possibly a secular change in dimensions. When an increase is observed, the gages should be cleaned of burrs or foreign substances and rechecked. If the increase is still greater than that specified in Par. 3.6 the gages shall be reconditioned.

3.8 Before re-use, all reconditioned gages shall be recertified by an official testing agency.

3.9 Reference master line-pipe gages made prior to January 1, 1940, can be used in establishing working gage standoff values, if proper corrections are applied. On line-pipe gages made prior to 1940, gage dimensions were referenced to a plane 5 thread turns from the E_7 plane. Under current gage requirements, measurements are referred to the plane of vanish point, which is 5.47 thread turns from the E_7 plane (see Fig. 3.3). Other gage dimensions which affect gaging practice were not changed; therefore, gages made prior to 1940 may be used in current gaging practice, provided proper adjustment in standoff values is made for the shift in reference plane. These correction values, which are either negative or positive depending upon the standoff under consideration, are as follows:

Number of Threads Per Inch	Correction Difference in Values of g	
	in.	mm
27	0.017	0.43
18	0.026	0.66
14	0.034	0.86
11½	0.041	1.04
8	0.059	1.50

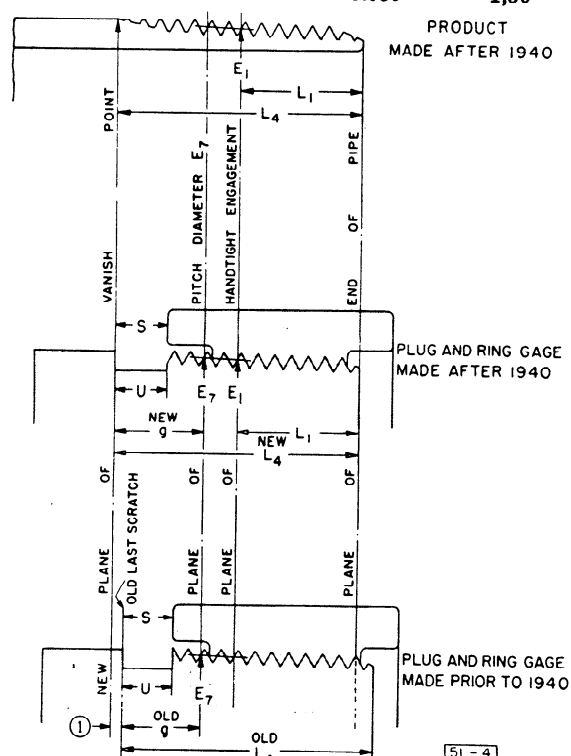


FIG. 3.3
COMPARISON OF LINE-PIPE GAGES MADE
SUBSEQUENT TO 1940 AND GAGES MADE
PRIOR TO 1940