



# Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System)<sup>1</sup>

This standard is issued under the fixed designation C 585; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This practice is intended as a dimensional standard for preformed rigid thermal insulation for pipes and tubing.

1.2 This practice covers insulation supplied in cylindrical sections, usually split into half-sections, and lists recommended inner and outer diameters of insulation having nominal wall thicknesses from 1 to 5 in. (25 to 127 mm) to fit over standard sizes of pipe and tubing.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values stated in SI units are provided for information only.

1.4 *This standard does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

- 2.1 *ASTM Standards:*<sup>2</sup>  
C 168 Terminology Relating to Thermal Insulation

## 3. Terminology

3.1 *Definitions*—Definitions pertaining to insulation are defined in Terminology C 168.

## 4. Significance and Use

4.1 The purpose of this practice is to ensure satisfactory fit on standard sizes, to accommodate radial expansion of pipes and tubes which are heated after being insulated, and to minimize the number of insulation sizes and thicknesses to be manufactured and stocked.

4.2 While insulation may be manufactured to these recommended dimensions, care should be exercised in attempting to

nest layers of different materials, or layers supplied by different manufacturers. Individual manufacturing processes may operate at slightly different tolerances. While the product will fit the pipe, it may not readily nest as the outer layer between the different materials or with different manufacturers. Care should be exercised to determine these differences before specifying or ordering nesting sizes.

4.3 Dimensions in accordance with this practice permit application of one thickness of pipe insulation over another (Nesting or Simplified Dimensional System), to obtain total thicknesses greater than those manufactured as single layer, or for multilayer application when desired.

## 5. Procedure

NOTE 1—Suggested tolerances are shown for information purposes only.

### 5.1 Measurement:

5.1.1 Measurement of inner and outer diameters shall be made to the nearest  $\frac{1}{32}$  in. (0.8 mm) using a steel tape or rule.

5.1.1.1 *Half Sections*—The diameter reported for each half-section shall be the average of six measurements taken at three locations including two near the ends and one near the center (see Fig. 1a and Fig. 2a). Three of the six readings shall be taken in the longitudinal plane of the flat, cut surface; the other three shall each be twice a half-diameter in the longitudinal plane at right angles to that of the first three (see Fig. 1b and Fig. 2b).

5.1.1.2 *Hinged Sections*—The diameter reported for each hinged section shall be the average of four measurements taken at both ends of the section (two per end) (see Fig. 3). The two measurements at each end shall be at right angles.

### 5.2 Recommended Inner Diameters:

5.2.1 Inner diameters and suggested tolerances for nominal sizes of insulation for pipe are shown in Table 1. Iron pipe in sizes for 4½, 5, 7-in. (113, 125, 175-mm), and larger odd-numbered diameters is not standard, but insulation for these is included for multi-layer purposes.

5.2.2 Inner diameters and suggested tolerances for nominal sizes of tubing through 6 in. (150-mm) are shown in Table 2.

### 5.3 Recommended Outer Diameters:

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.20 on Homogeneous Inorganic Thermal Insulations.

Current edition approved April 1, 2004. Published May 2004. Originally approved in 1966 to replace C 312 and C 521. Last previous edition approved in 1998 as C 585 – 90 (1998).

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

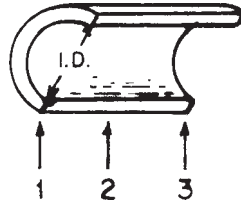


Fig. 1a Three Measurement Locations



Fig. 1b Diameter and Half-Diameter Measurement Locations  
FIG. 1 Inner Diameter Measurement

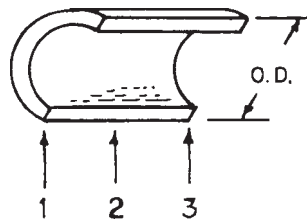


Fig. 2a Three Measurement Locations

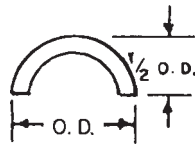


Fig. 2b Diameter and Half-Diameter Measurement Locations  
FIG. 2 Outer Diameter Measurement

5.3.1 Nominal outer diameters for nominal sizes of pipe are shown in Table 3 and Table 4 and tubing in Table 5 and Table 6. It should be noted that these values for both pipe and tubing are identical with iron pipe outer diameters as shown in Columns 2 and 3 of Table 3 and Table 4. Table 3, Table 4, Table 5, and Table 6 are for nesting purposes only. When product is to be nested, it shall be so stated on order.

5.3.2 Suggested maximum outer diameters for nominal sizes of pipe are shown in Table 7 and Table 8 and tubing in Table 9 and Table 10. Table 7, Table 8, Table 9, and Table 10 are for jacketing purposes only.

5.4 *Approximate Insulation Wall Thickness:*

5.4.1 For information purposes, the wall thicknesses of pipe insulation obtained by subtracting inner diameters in Table 1 from corresponding outer diameters in Table 3 and Table 4, and dividing the results by two, are shown in Table 11. Corresponding values for tubing are shown in Table 12.

6. **Keywords**

6.1 pipe thermal insulation diameter; pipe thermal insulation dimension; pipe thermal insulation thickness; thermal insulation; thermal insulating materials-pipe; thermal insulating materials-rigid; tubing thermal insulation thickness

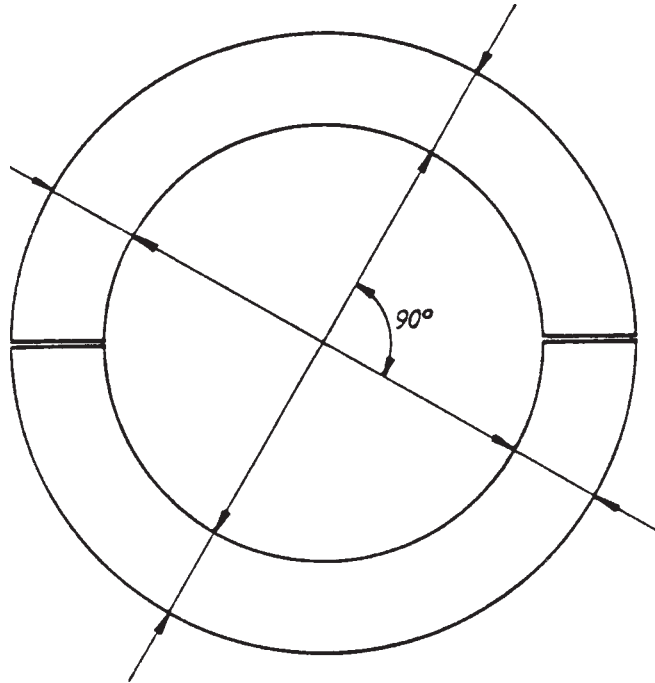


FIG. 3 Hinged Section Measurement Locations

TABLE 1 Inner Diameter of Insulation for Nominal Pipe Size (NPS)

Pipe		Insulation							
Nominal Size	Outer Diameter		Inner Diameter		Tolerance				
	in.	mm	in.	mm	Minus		Plus		
	in.	mm	in.	mm	in.	mm	in.	mm	
1/2	0.840	21.3	0.86	22	0	0	1/16	1.6	
3/4	1.050	26.7	1.07	27	0	0	1/16	1.6	
1	1.315	33.4	1.33	34	0	0	1/16	1.6	
1 1/4	1.660	42.2	1.68	43	0	0	1/16	1.6	
1 1/2	1.900	48.3	1.92	49	0	0	1/16	1.6	
2	2.375	60.3	2.41	61	0	0	3/32	2.4	
2 1/2	2.875	73.0	2.91	74	0	0	3/32	2.4	
3	3.500	88.9	3.53	90	0	0	3/32	2.4	
3 1/2	4.000	101.6	4.03	102	1/32	0.8	3/32	2.4	
4	4.500	114.3	4.53	115	1/32	0.8	3/32	2.4	
4 1/2	5.000	127.0	5.03	128	1/32	0.8	3/32	2.4	
5	5.563	141.4	5.64	143	1/32	0.8	3/32	2.4	
6	6.625	168.3	6.70	170	1/32	0.8	3/32	2.4	
7	7.625	193.7	7.70	196	1/32	0.8	3/32	2.4	
8	8.625	219.1	8.70	221	1/32	0.8	3/32	2.4	
9	9.625	244.5	9.70	246	1/32	0.8	3/32	2.4	
10	10.750	273.0	10.83	275	1/32	0.8	3/32	2.4	
11	11.750	298.4	11.83	300	1/32	0.8	3/32	2.4	
12	12.750	323.8	12.84	326	1/16	1.6	3/32	2.4	
14 <sup>A</sup>	14.000	355.6	14.09	358	1/16	1.6	5/32	4.0	

<sup>A</sup> Larger sizes through 26 in., in 1-in. (25.4-mm) increments.



**C 585 – 90 (2004)**

**TABLE 2 Inner Diameter of Insulation Tubes**

Tube			Insulation						
Nominal Size	Outer Diameter		Inner Diameter		Tolerance				
	in.	mm	in.	mm	Minus		Plus		
	in.	mm	in.	mm	in.	mm	in.	mm	
3/8	0.500	12.7	0.52	13	0	0	1/16	1.6	
1/2	0.625	15.9	0.64	16	0	0	1/16	1.6	
3/4	0.875	22.2	0.89	23	0	0	1/16	1.6	
1	1.125	28.6	1.14	29	0	0	1/16	1.6	
1 1/4	1.375	34.9	1.39	35	0	0	1/16	1.6	
1 1/2	1.625	41.3	1.64	42	0	0	1/16	1.6	
2	2.125	54.0	2.16	55	0	0	1/16	1.6	
2 1/2	2.625	66.7	2.66	68	0	0	1/16	1.6	
3	3.125	79.4	3.16	80	0	0	1/16	1.6	
3 1/2	3.625	92.1	3.66	93	0	0	1/16	1.6	
4	4.125	104.8	4.16	106	1/32	0.8	3/32	2.4	
5	5.125	130.2	5.16	131	1/32	0.8	3/32	2.4	
6	6.125	155.6	6.20	157	1/32	0.8	3/32	2.4	

**TABLE 3 Outer Diameters of Insulation for Nominal Pipe Sizes (NPS), in.**

Pipe Nominal Size	Insulation, Nominal Thickness									
	in.	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5
	mm	25	38	51	64	76	89	102	114	127
	in.	Outer Diameter, in. <sup>A</sup>								
1/2	2.88	4.00	5.00	6.62	7.62	8.62	9.62	10.75	11.75	11.75
3/4	2.88	4.00	5.00	6.62	7.62	8.62	9.62	10.75	11.75	11.75
1	3.50	4.50	5.56	6.62	7.62	8.62	9.62	10.75	11.75	11.75
1 1/4	3.50	5.00	5.56	6.62	7.62	8.62	9.62	10.75	11.75	11.75
1 1/2	4.00	5.00	6.62	7.62	8.62	9.62	10.75	11.75	12.75	12.75
2	4.50	5.56	6.62	7.62	8.62	9.62	10.75	11.75	12.75	12.75
2 1/2	5.00	6.62	7.62	8.62	9.62	10.75	11.75	12.75	14.00	14.00
3	5.56	6.62	7.62	8.62	9.62	10.75	11.75	12.75	14.00	14.00
3 1/2	6.62	7.62	8.62	9.62	10.75	11.75	12.75	14.00	15.00	15.00
4	6.62	7.62	8.62	9.62	10.75	11.75	12.75	14.00	15.00	15.00
4 1/2	7.62	8.62	9.62	10.75	11.75	12.75	14.00	15.00	16.00	16.00
5	7.62	8.62	9.62	10.75	11.75	12.75	14.00	15.00	16.00	16.00
6	8.62	9.62	10.75	11.75	12.75	14.00	15.00	16.00	17.00	17.00
7	...	10.75	11.75	12.75	14.00	15.00	16.00	17.00	18.00	18.00
8	...	11.75	12.75	14.00	15.00	16.00	17.00	18.00	19.00	19.00
9	...	12.75	14.00	15.00	16.00	17.00	18.00	19.00	20.00	20.00
10	...	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	21.00
11	...	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	22.00
12	...	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	23.00
14 <sup>B</sup>	...	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00	24.00

<sup>A</sup> These are identical with pipe outer diameters (see Table 1, Columns 2 and 3).

<sup>B</sup> Larger sizes through 36 in., in 1-in. (25.4-mm) increments.



**TABLE 4 Outer Diameters of Insulation for Nominal Pipe Sizes (NPS), mm**

Pipe		Insulation, Nominal Thickness								
Nominal Size	in.	1	1½	2	2½	3	3½	4	4½	5
	mm	25	38	51	64	76	89	102	114	127
in.		Outer Diameter, mm <sup>A</sup>								
½		73	102	127	168	194	219	244	273	298
¾		73	102	127	168	194	219	244	273	298
1		89	114	141	168	194	219	244	273	298
1¼		89	127	141	168	194	219	244	273	298
1½		102	127	168	194	219	244	273	298	324
2		114	141	168	194	219	244	273	298	324
2½		127	168	194	219	244	273	298	324	356
3		141	168	194	219	244	273	298	324	356
3½		168	194	219	244	273	298	324	356	381
4		168	194	219	244	273	298	324	356	381
4½		194	219	244	273	298	324	356	381	406
5		194	219	244	273	298	324	356	381	406
6		219	244	273	298	324	356	381	406	432
7		...	273	298	324	356	381	406	432	457
8		...	298	324	356	381	406	432	457	483
9		...	324	356	381	406	432	457	483	508
10		...	356	381	406	432	457	483	508	533
11		...	381	406	432	457	483	508	533	559
12		...	406	432	457	483	508	533	559	584
14 <sup>B</sup>		...	432	457	483	508	533	559	584	610

<sup>A</sup> These are identical with pipe outer diameters (see Table 1, Columns 2 and 3).

<sup>B</sup> Larger sizes through 36 in., in 1-in. (25.4-mm) increments.

**TABLE 5 Outer Diameters of Insulation for Tubes, in.**

Tube		Insulation, Nominal Thickness								
Nominal Size	in.	1	1½	2	2½	3	3½	4	4½	5
	mm	25	38	51	64	76	89	102	114	127
in.		Outer Diameter, in. <sup>A</sup>								
⅜		2.38	3.50	4.50	5.56	6.62	...	...	...	...
½		2.88	3.50	4.50	5.56	6.62	...	...	...	...
¾		2.88	4.00	5.00	6.62	7.62	8.62	9.62	10.75	11.75
1		2.88	4.00	5.00	6.62	7.62	8.62	9.62	10.75	11.75
1¼		3.50	4.50	5.56	6.62	7.62	8.62	9.62	10.75	11.75
1½		3.50	4.50	5.56	6.62	7.62	8.62	9.62	10.75	11.75
2		4.00	5.00	6.62	7.62	8.62	9.62	10.75	11.75	12.75
2½		4.50	5.56	6.62	7.62	8.62	9.62	10.75	11.75	12.75
3		5.00	6.62	7.62	8.62	9.62	10.75	11.75	12.75	14.00
3½		5.56	6.62	7.62	8.62	9.62	10.75	11.75	12.75	14.00
4		6.62	7.62	8.62	9.62	10.75	11.75	12.75	14.00	15.00
5		7.62	8.62	9.62	10.75	11.75	12.75	14.00	15.00	16.00
6		8.62	9.62	10.75	11.75	12.75	14.00	15.00	16.00	17.00

<sup>A</sup> These are identical with pipe outer diameters (see Table 1, Columns 2 and 3).



**C 585 – 90 (2004)**

**TABLE 6 Outer Diameters of Insulation for Tubes, mm**

Tube		Insulation, Nominal Thickness								
Nominal Size	in.	1	1½	2	2½	3	3½	4	4½	5
	mm	25	38	51	64	76	89	102	114	127
in.		Outer Diameter, mm <sup>A</sup>								
¾		60	89	114	141	168	...	...	...	...
½		73	89	114	141	168	...	...	...	...
¾		73	102	127	168	194	219	244	273	298
1		73	102	127	168	194	219	244	273	298
1¼		89	114	141	168	194	219	244	273	298
1½		89	114	141	168	194	219	244	273	298
2		102	127	168	194	219	244	273	298	324
2½		114	141	168	194	219	244	273	298	324
3		127	168	194	219	244	273	298	324	356
3½		141	168	194	219	244	273	298	324	356
4		168	194	219	244	273	298	324	356	381
5		194	219	244	273	298	324	356	381	406
6		219	244	273	298	324	356	381	406	432

<sup>A</sup> These are identical with pipe outer diameters (see Table 1, Columns 2 and 3).

**TABLE 7 Outer Diameters of Insulation for Nominal Pipe Sizes (NPS), maximum, in.**

Pipe		Insulation, Nominal Thickness								
Nominal Size	in.	1	1½	2	2½	3	3½	4	4½	5
	mm	25	38	51	64	76	89	102	114	127
in.		Outer Diameter, in. <sup>A</sup>								
½		3.25	4.38	5.38	7	8	9	10	11.13	12.13
¾		3.25	4.38	5.38	7	8	9	10	11.13	12.13
1		3.88	4.88	6	7	8	9	10	11.13	12.13
1¼		3.88	5.38	6	7	8	9	10	11.13	12.13
1½		4.38	5.38	7	8	9	10	11.13	12.13	13.13
2		4.88	6	7	8	9	10	11.13	12.13	13.13
2½		5.38	7	8	9	10	11.13	12.13	13.13	14.38
3		6	7	8	9	10	11.13	12.13	13.13	14.38
3½		7	8	9	10	11.13	12.13	13.13	13.13	14.38
4		7	8	9	10	11.13	12.13	13.13	14.38	15.38
4½		8	9	10	11.13	12.13	13.13	14.38	14.38	15.38
5		9	9	10	11.13	12.13	13.13	14.38	15.38	16.38
6		9	10	11.13	12.13	13.13	14.38	15.38	16.38	17.38
7		...	11.13	12.13	13.13	14.38	15.38	16.38	17.38	18.38
8		...	12.13	13.13	14.38	15.38	16.38	17.38	18.38	19.38
9		...	13.13	14.38	15.38	16.38	17.38	18.38	19.38	20.38
10		...	14.38	15.38	16.38	17.38	18.38	19.38	20.38	21.38
11		...	15.38	16.38	17.38	18.38	19.38	20.38	21.38	22.38
12		...	16.38	17.38	18.38	19.38	20.38	21.38	22.38	23.38
14 <sup>B</sup>		...	17.50	18.50	19.50	20.50	21.50	22.50	23.50	24.50

<sup>A</sup> These are identical with pipe outer diameters (see Table 1, Columns 2 and 3).

<sup>B</sup> Larger sizes through 36 in., in 1-in. (25.4-mm) increments.



**C 585 – 90 (2004)**

**TABLE 8 Outer Diameters of Insulation for Nominal Pipe Sizes (NPS), maximum, mm**

Pipe		Insulation, Nominal Thickness								
Nominal Size	in.	1	1½	2	2½	3	3½	4	4½	5
	mm	25	38	51	64	76	89	102	114	127
in.		Outer Diameter, mm <sup>A</sup>								
½		83	112	137	178	203	229	254	283	308
¾		83	112	137	178	203	229	254	283	308
1		99	124	153	178	203	229	254	283	308
1¼		99	137	153	178	203	229	254	283	308
1½		112	137	178	203	229	254	283	308	334
2		124	153	178	203	229	254	283	308	334
2½		137	178	203	229	254	283	308	334	365
3		153	178	203	229	254	283	308	334	365
3½		178	203	229	254	283	308	334	365	391
4		178	203	229	254	283	308	334	365	391
4½		203	229	254	283	308	334	365	391	416
5		229	229	254	283	308	334	365	391	416
6		229	254	283	308	334	365	391	416	441
7		...	283	308	334	365	391	416	441	467
8		...	308	334	365	391	416	441	467	492
9		...	334	365	391	416	441	467	492	518
10		...	365	391	416	441	467	492	518	543
11		...	391	416	441	467	492	518	543	568
12		...	416	441	467	492	518	543	568	594
14 <sup>B</sup>		...	445	470	495	521	546	572	597	622

<sup>A</sup> These are identical with pipe outer diameters (see Table 1, Columns 2 and 3).

<sup>B</sup> Larger sizes through 36 in. in 1-in. (25.4-mm) increments.

**TABLE 9 Outer Diameters of Insulation for Tubes, Maximum, in.**

Tube		Insulation, Nominal Thickness								
Nominal Size	in.	1	1½	2	2½	3	3½	4	4½	5
	mm	25	38	51	64	76	89	102	114	127
in.		Outer Diameter, in. <sup>A</sup>								
⅜		2.75	3.88	4.88	5.88	7	...	...	...	...
½		3.25	3.88	4.88	5.88	7	...	...	...	...
¾		3.25	4.38	5.38	7	8	9	10	11.13	12.13
1		3.25	4.38	5.38	7	8	9	10	11.13	12.13
1¼		3.88	4.88	5.88	7	8	9	10	11.13	12.13
1½		3.88	4.88	5.88	7	8	9	10	11.13	12.13
2		4.38	5.38	7	8	9	10	11.13	12.13	13.13
2½		4.88	5.88	7	8	9	10	11.13	12.13	13.13
3		5.38	7	8	9	10	11.13	12.13	13.13	14.38
3½		5.88	7	8	9	10	11.13	12.13	13.13	14.38
4		7	8	9	10	11.13	12.13	13.13	14.38	15.38
5		8	9	10	11.13	12.13	13.13	14.38	15.38	16.38
6		9	10	11.13	12.13	13.13	14.38	15.38	16.38	17.38

<sup>A</sup> These are identical with pipe outer diameters (see Table 1, Columns 2 and 3).



**TABLE 10 Outer Diameters of Insulation for Tubes, Maximum, mm**

Tube		Insulation, Nominal Thickness								
Nominal Size	in.	1	1½	2	2½	3	3½	4	4½	5
	mm	25	38	51	64	76	89	102	114	127
in.		Outer Diameter, mm <sup>A</sup>								
¾		70	99	124	149	178	...	...	...	...
½		83	99	124	149	178	...	...	...	...
¾		83	111	137	178	203	229	254	283	308
1		83	111	137	178	203	229	254	283	308
1¼		99	124	149	178	203	229	254	283	308
1½		99	124	149	178	203	229	254	283	308
2		111	137	178	203	229	254	283	308	334
2½		124	149	178	203	229	254	283	308	334
3		137	178	203	229	254	283	308	334	365
3½		149	178	203	229	254	283	308	334	365
4		178	203	229	254	283	308	334	365	391
5		203	229	254	283	308	334	365	391	416
6		229	254	283	308	334	365	391	416	441

<sup>A</sup> These are identical with pipe outer diameters (see Table 1, Columns 2 and 3).

**TABLE 11 Approximate Wall Thickness of Insulation for Pipes**

Pipe		Insulation, Nominal Thickness																
Nominal Size	in.	1	1½	2	2½	3	3½	4	4½	5	Approximate Wall Thickness							
	mm	25	38	51	64	76	89	102	114	127	in.	mm	in.	mm	in.	mm	in.	mm
½	1.01	26	1.57	40	2.07	53	2.88	73	3.38	86	3.88	99	4.38	111	4.95	126	5.45	138
¾	0.90	23	1.46	37	1.96	50	2.78	71	3.28	83	3.78	96	4.28	109	4.84	123	5.34	136
1	1.08	27	1.58	40	2.12	54	2.64	67	3.14	80	3.64	92	4.14	105	4.71	120	5.21	132
1¼	0.91	23	1.66	42	1.94	49	2.47	63	2.97	75	3.47	88	3.97	101	4.54	115	5.04	128
1½	1.04	26	1.54	39	2.35	60	2.85	72	3.35	85	3.85	98	4.42	112	4.92	125	5.42	138
2	1.04	26	1.58	40	2.10	53	2.60	66	3.10	79	3.60	91	4.17	106	4.67	119	5.17	131
2½	1.04	26	1.86	47	2.36	60	2.86	73	3.36	85	3.92	100	4.42	112	4.92	125	5.55	141
3	1.02	26	1.54	39	2.04	52	2.54	65	3.04	77	3.61	92	4.11	104	4.61	117	5.24	133
3½	1.30	33	1.80	46	2.30	58	2.80	71	3.36	85	3.86	98	4.36	111	4.36	111	4.99	127
4	1.04	26	1.54	39	2.04	52	2.54	65	3.11	79	3.61	92	4.11	104	4.74	120	5.24	133
4½	1.30	33	1.80	46	2.30	58	2.86	73	3.36	85	3.86	98	4.48	114	4.49	114	4.99	127
5	0.99	25	1.49	38	1.99	51	2.56	65	3.06	78	3.56	90	4.18	106	4.68	119	5.18	132
6	0.96	24	1.46	37	2.02	51	2.52	64	3.02	77	3.65	93	4.15	105	4.65	118	5.15	131
7	...	...	1.52	39	2.02	51	2.52	64	3.15	80	3.65	93	4.15	105	4.65	118	5.15	131
8	...	...	1.52	39	2.02	51	2.65	67	3.15	80	3.65	93	4.15	105	4.65	118	5.15	131
9	...	...	1.52	39	2.15	55	2.65	67	3.15	80	3.65	93	4.15	105	4.65	118	5.15	131
10	...	...	1.58	40	2.08	53	2.58	66	3.08	78	3.58	91	4.08	104	4.60	117	5.10	127
11	...	...	1.58	40	2.08	53	2.58	66	3.08	78	3.58	91	4.08	104	4.60	117	5.10	127
12	...	...	1.58	40	2.08	53	2.58	66	3.08	78	3.58	91	4.08	104	4.58	116	5.08	129
14 <sup>A</sup>	...	...	1.46	37	1.96	50	2.46	62	2.96	75	3.46	88	3.96	101	4.46	113	4.96	126

<sup>A</sup> Larger sizes through 36 in., same as for 14 in.





TABLE 12 Approximate Wall Thickness of Insulation for Tubes

Tube		Insulation, Nominal Thickness																
Nominal Size	in.	1	1½	2	2½	3	3½	4	4½	5	Approximate Wall Thickness							
	mm	25	38	51	64	76	89	102	114	127	in.	mm	in.	mm	in.	mm	in.	mm
3/8	0.93	24	1.49	38	1.99	51	2.52	64	3.05	77	...	...	...	...	...	...	...	...
1/2	1.12	28	1.43	36	1.93	49	2.46	62	2.99	76	...	...	...	...	...	...	...	...
3/4	1.00	25	1.56	40	2.06	52	2.86	73	3.36	85	3.87	98	4.37	111	4.93	125	5.43	138
1	0.87	22	1.43	36	1.93	49	2.74	70	3.24	82	3.74	95	4.24	108	4.81	122	5.31	135
1¼	1.06	27	1.56	40	2.08	53	2.62	67	3.12	79	3.62	92	4.12	105	4.68	119	5.18	132
1½	0.93	24	1.43	36	1.96	50	2.49	63	2.99	76	3.49	89	3.99	101	4.55	116	5.06	129
2	0.92	23	1.42	36	2.23	57	2.73	69	3.23	82	3.73	95	4.30	109	4.80	122	5.30	135
2½	0.92	23	1.45	37	1.98	50	2.48	63	2.98	76	3.48	88	4.04	103	4.55	116	5.05	128
3	0.92	23	1.73	44	2.23	57	2.73	69	3.23	82	3.80	97	4.30	109	4.80	122	5.42	138
3½	0.95	24	1.48	38	1.98	50	2.48	63	2.98	76	3.54	90	4.04	103	4.55	116	5.17	131
4	1.23	31	1.73	44	2.23	57	2.73	69	3.30	84	3.80	97	4.30	109	4.92	125	5.42	138
5	1.23	31	1.73	44	2.23	57	2.80	71	3.30	84	3.80	97	4.42	112	4.92	125	5.42	138
6	1.21	31	1.71	43	2.28	58	2.78	71	3.28	83	3.90	99	4.40	112	4.90	125	5.40	137

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).