

INSULATION THICKNESS TABLES

The following tables compare the minimum insulation thickness required to maintain the outside surface temperature at or below 140°F. These tables were generated using the NAIMA 3E-Plus computer program which follows the heat transfer calculation methodology in ASTM C680.

OPERATING CONDITIONS ARE:

- Pipe Insulation Dimensions per ASTM C585
- Minimum Thickness of Insulation Offered is 1.0 Inch *Preformed Insulation Only
- Ambient Temperature = 75°F
- Surface Emittance of Weathered Aluminum Jacket = 0.30
- Wind Velocity = 2.5 mph

300°F - Operating Temperature				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
0.5 (15)	1.0 (25)	1.0 (25)	1.0 (25)	0.20 (5)
0.75 (20)	1.0 (25)	1.0 (25)	1.0 (25)	0.20 (5)
1.0 (25)	1.0 (25)	1.0 (25)	1.0 (25)	0.20 (5)
1.5 (40)	1.0 (25)	1.0 (25)	1.0 (25)	0.20 (5)
2 (50)	1.0 (25)	1.0 (25)	1.0 (25)	0.20 (5)
3 (80)	1.0 (25)	1.0 (25)	1.0 (25)	0.20 (5)
4 (100)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
6 (150)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
8 (200)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
10 (250)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
12 (300)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
14 (350)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
16 (400)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
18 (450)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
20 (500)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
24 (600)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
30 (750)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
36 (900)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
48 (1220)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)

400°F - Operating Temperature				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
0.5 (15)	1.0 (25)	1.0 (25)	1.0 (25)	0.20 (5)
0.75 (20)	1.0 (25)	1.0 (25)	1.0 (25)	0.20 (5)
1.0 (25)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
1.5 (40)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
2 (50)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
3 (80)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
4 (100)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
6 (150)	1.0 (25)	1.5 (40)	1.0 (25)	0.40 (10)
8 (200)	1.0 (25)	1.5 (40)	1.0 (25)	0.60 (15)
10 (250)	1.0 (25)	1.5 (40)	1.0 (25)	0.60 (15)
12 (300)	1.0 (25)	1.5 (40)	1.0 (25)	0.60 (15)
14 (350)	1.5 (40)	1.5 (40)	1.0 (25)	0.60 (15)
16 (400)	1.5 (40)	1.5 (40)	1.0 (25)	0.60 (15)
18 (450)	1.5 (40)	1.5 (40)	1.0 (25)	0.60 (15)
20 (500)	1.5 (40)	1.5 (40)	1.0 (25)	0.60 (15)
24 (600)	1.5 (40)	1.5 (40)	1.0 (25)	0.60 (15)
30 (750)	1.5 (40)	2.0 (50)	1.5 (40)	0.60 (15)
36 (900)	1.5 (40)	2 (50)	1.5 (40)	0.60 (15)
48 (1220)	1.5 (40)	2 (50)	1.5 (40)	0.80 (20)

500°F - Operating Temperature				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
0.5 (15)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
0.75 (20)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
1.0 (25)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
1.5 (40)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
2 (50)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
3 (80)	1.0 (25)	1.5 (40)	1.0 (25)	0.60 (15)
4 (100)	1.0 (25)	1.5 (40)	1.0 (25)	0.60 (15)
6 (150)	1.5 (40)	1.5 (40)	1.0 (25)	0.60 (15)
8 (200)	1.5 (40)	2.0 (50)	1.5 (40)	0.80 (20)
10 (250)	1.5 (40)	2.0 (50)	1.5 (40)	0.80 (20)
12 (300)	1.5 (40)	2.0 (50)	1.5 (40)	0.80 (20)
14 (350)	2.0 (50)	2.0 (50)	1.5 (40)	0.80 (20)
16 (400)	2.0 (50)	2.0 (50)	1.5 (40)	0.80 (20)
18 (450)	2.0 (50)	2.0 (50)	1.5 (40)	0.80 (20)
20 (500)	2.0 (50)	2.0 (65)	1.5 (40)	0.80 (20)
24 (600)	2.0 (50)	2.0 (65)	1.5 (40)	0.80 (20)
30 (750)	2.0 (50)	2.0 (65)	1.5 (40)	1.2 (30)
36 (900)	2.0 (50)	2.0 (65)	2.0 (50)	1.2 (30)
48 (1220)	2.0 (50)	2.0 (65)	2.0 (50)	1.2 (30)

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600°F - Operating Temperature				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
0.5 (13)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
0.75 (19)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
1.0 (25)	1.0 (25)	1.0 (25)	1.0 (25)	0.40 (10)
1.5 (38)	1.0 (25)	1.5 (40)	1.0 (25)	0.60 (15)
2 (51)	1.5 (40)	1.5 (40)	1.0 (25)	0.60 (15)
3 (76)	1.5 (40)	1.5 (40)	1.5 (40)	0.60 (15)
4 (102)	1.5 (40)	2.0 (50)	1.5 (40)	0.80 (20)
6 (152)	2.0 (50)	2.0 (50)	1.5 (40)	0.80 (20)
8 (203)	2.0 (50)	2.5 (65)	1.5 (40)	0.80 (20)
10 (254)	2.0 (50)	2.5 (65)	1.5 (40)	1.0 (25)
12 (305)	2.0 (50)	2.5 (65)	2.0 (50)	1.0 (25)
14 (356)	2.5 (65)	2.5 (65)	2.0 (50)	1.0 (25)
16 (406)	2.5 (65)	3.0 (80)	2.0 (50)	1.2 (30)
18 (457)	2.5 (65)	3.0 (80)	2.0 (50)	1.2 (30)
20 (508)	2.5 (65)	3.0 (80)	2.0 (50)	1.2 (30)
24 (610)	2.5 (65)	3.0 (80)	2.0 (50)	1.2 (30)
30 (762)	2.5 (65)	3.0 (80)	2.5 (65)	1.2 (30)
36 (914)	2.5 (65)	3.0 (80)	2.5 (65)	1.2 (30)
48 (1219)	3.0 (80)	3.0 (80)	2.5 (65)	1.2 (30)

700°F - Operating Temperature				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
0.5 (15)	1.0 (25)	1.0 (25)	1.0 (25)	0.60 (15)
0.75 (20)	1.0 (25)	1.0 (25)	1.0 (25)	0.60 (15)
1.0 (25)	1.0 (25)	1.5 (40)	1.0 (25)	0.60 (15)
1.5 (40)	1.5 (40)	1.5 (40)	1.5 (40)	0.60 (15)
2 (50)	1.5 (40)	2.0 (50)	1.5 (40)	0.80 (20)
3 (80)	2.0 (50)	2.0 (50)	1.5 (40)	0.80 (20)
4 (100)	2.0 (50)	2.5 (65)	1.5 (40)	1.0 (25)
6 (150)	2.0 (50)	2.5 (65)	2.0 (50)	1.0 (25)
8 (200)	2.5 (65)	2.5 (65)	2.0 (50)	1.0 (25)
10 (250)	2.5 (65)	3.0 (80)	2.0 (50)	1.2 (30)
12 (300)	2.5 (65)	3.0 (80)	2.5 (65)	1.2 (30)
14 (350)	3.0 (80)	3.5 (90)	2.5 (65)	1.2 (30)
16 (400)	3.0 (80)	3.5 (90)	2.5 (65)	1.4 (35)
18 (450)	3.0 (80)	3.5 (90)	2.5 (65)	1.4 (35)
20 (500)	3.0 (80)	3.5 (90)	2.5 (65)	1.4 (35)
24 (600)	3.0 (80)	4.0 (100)	3.0 (80)	1.4 (35)
30 (750)	3.5 (90)	4.0 (100)	3.0 (80)	1.4 (35)
36 (900)	3.5 (90)	4.0 (100)	3.0 (80)	1.6 (40)
48 (1220)	3.5 (90)	4.5 (115)	3.0 (80)	1.6 (40)

800°F - Operating Temperature				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
0.5 (15)	1.5 (40)	1.5 (40)	1.0 (25)	0.60 (15)
0.75 (20)	1.5 (40)	2.0 (50)	1.5 (40)	0.60 (15)
1.0 (25)	1.5 (40)	2.0 (50)	1.5 (40)	0.80 (20)
1.5 (40)	1.5 (40)	2.0 (50)	1.5 (40)	0.80 (20)
2 (50)	2.0 (50)	2.0 (50)	1.5 (40)	0.80 (20)
3 (80)	2.0 (50)	2.5 (65)	2.0 (50)	1.0 (25)
4 (100)	2.5 (65)	3.0 (80)	2.0 (50)	1.0 (25)
6 (150)	2.5 (65)	3.0 (80)	2.5 (65)	1.2 (30)
8 (200)	2.5 (65)	3.5 (90)	2.5 (65)	1.4 (35)
10 (250)	3.0 (80)	3.5 (90)	2.5 (65)	1.4 (35)
12 (300)	3.0 (80)	4.0 (100)	3.0 (80)	1.4 (35)
14 (350)	3.5 (90)	4.0 (100)	3.0 (80)	1.6 (40)
16 (400)	3.5 (90)	4.0 (100)	3.0 (80)	1.6 (40)
18 (450)	3.5 (90)	4.0 (100)	3.5 (90)	1.6 (40)
20 (500)	3.5 (90)	4.5 (115)	3.5 (90)	1.6 (40)
24 (600)	4.0 (100)	4.5 (115)	3.5 (90)	1.8 (45)
30 (750)	4.0 (100)	4.5 (115)	3.5 (90)	1.8 (45)
36 (900)	4.0 (100)	5.0 (125)	3.5 (90)	1.8 (45)
48 (1220)	4.5 (115)	5.0 (125)	4.0 (100)	2.0 (50)

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900°F - Operating Temperature				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
0.5 (15)	1.5 (40)	2.0 (50)	1.5 (40)	0.80 (20)
0.75 (20)	2.0 (50)	2.0 (50)	1.5 (40)	0.80 (20)
1.0 (25)	2.0 (50)	2.0 (50)	1.5 (40)	0.80 (20)
1.5 (40)	2.0 (50)	2.0 (50)	2.0 (50)	1.0 (25)
2 (50)	2.0 (50)	2.0 (65)	2.0 (50)	1.0 (25)
3 (80)	2.0 (65)	3.0 (80)	2.0 (65)	1.2 (30)
4 (100)	2.0 (65)	3.0 (80)	2.0 (65)	1.2 (30)
6 (150)	3.0 (80)	3.5 (90)	3.0 (80)	1.4 (35)
8 (200)	3.0 (80)	4.0 (100)	3.0 (80)	1.6 (40)
10 (250)	3.5 (90)	4.0 (100)	3.5 (90)	1.6 (40)
12 (300)	3.5 (90)	4.0 (100)	3.5 (90)	1.8 (45)
14 (350)	4.0 (100)	4.5 (115)	3.5 (90)	1.8 (45)
16 (400)	4.0 (100)	5.0 (125)	4.0 (100)	1.8 (45)
18 (450)	4.0 (100)	5.0 (125)	4.0 (100)	2.0 (50)
20 (500)	4.5 (115)	5.0 (125)	4.0 (100)	2.0 (50)
24 (600)	4.5 (115)	5.5 (140)	4.0 (100)	2.0 (50)
30 (750)	4.5 (115)	5.5 (140)	4.5 (115)	2.2 (55)
36 (900)	5.0 (125)	6.0 (150)	4.5 (115)	2.2 (55)
48 (1220)	5.0 (125)	6.0 (150)	5.0 (125)	2.0 (60)

1000°F - Operating Temperature				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
0.5 (13)	2.0 (50)	2.0 (50)	1.5 (40)	0.80 (20)
0.75 (19)	2.0 (50)	2.0 (50)	2.0 (50)	0.80 (20)
1.0 (25)	2.0 (50)	2.0 (50)	2.0 (50)	1.0 (25)
1.5 (38)	2.0 (50)	2.5 (65)	2.0 (50)	1.0 (25)
2 (51)	2.5 (65)	3.0 (80)	2.5 (65)	1.2 (30)
3 (76)	3.0 (80)	3.5 (90)	3.0 (80)	1.4 (35)
4 (102)	3.0 (80)	3.5 (90)	3.0 (80)	1.4 (35)
6 (152)	3.5 (90)	4.0 (100)	3.5 (90)	1.6 (40)
8 (203)	3.5 (90)	4.5 (115)	3.5 (90)	1.8 (45)
10 (254)	4.0 (100)	5.0 (125)	4.0 (100)	2.0 (50)
12 (305)	4.5 (115)	5.0 (125)	4.0 (100)	2.0 (50)
14 (356)	4.5 (115)	5.5 (140)	4.5 (115)	2.2 (55)
16 (406)	4.5 (115)	5.5 (140)	4.5 (115)	2.2 (55)
18 (457)	5.0 (125)	5.5 (140)	4.5 (115)	2.2 (55)
20 (508)	5.0 (125)	6.0 (150)	5.0 (125)	2.2 (55)
24 (610)	5.0 (125)	6.0 (150)	5.0 (125)	2.4 (60)
30 (762)	5.5 (140)	6.5 (165)	5.5 (140)	2.4 (60)
36 (914)	5.5 (140)	6.5 (165)	5.5 (140)	2.6 (65)
48 (1219)	6.0 (150)	7.0 (175)	5.5 (140)	2.6 (65)

1100°F - Operating Temperature				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
0.5 (15)	2.0 (51)	2.5 (65)	2.0 (51)	1.0 (25)
0.75 (20)	2.5 (65)	2.5 (65)	2.5 (65)	1.0 (25)
1.0 (25)	2.5 (65)	2.5 (65)	2.5 (65)	1.2 (30)
1.5 (40)	2.5 (65)	3.0 (80)	2.5 (65)	1.2 (30)
2.0 (50)	3.0 (80)	3.5 (90)	3.0 (80)	1.4 (35)
3 (80)	3.5 (90)	4.0 (100)	3.5 (90)	1.6 (40)
4 (100)	3.5 (90)	4.0 (100)	3.5 (90)	1.6 (40)
6 (150)	4.0 (100)	4.5 (115)	4.0 (100)	1.8 (45)
8 (200)	4.5 (115)	5.0 (125)	4.0 (100)	2.0 (50)
10 (250)	4.5 (115)	5.0 (125)	4.5 (115)	2.2 (55)
12 (300)	5.0 (125)	6.0 (150)	5.0 (125)	2.4 (60)
14 (350)	5.0 (125)	6.0 (150)	5.0 (125)	2.4 (60)
16 (400)	5.5 (140)	6.5 (165)	5.5 (140)	2.4 (60)
18 (450)	5.5 (140)	6.5 (165)	5.5 (140)	2.6 (65)
20 (500)	5.5 (140)	6.5 (165)	5.5 (140)	2.6 (65)
24 (600)	6.0 (150)	7.0 (175)	6.0 (150)	2.8 (70)
30 (750)	6.0 (150)	7.5 (190)	6.0 (150)	2.8 (70)
36 (900)	6.5 (165)	7.5 (190)	6.5 (165)	3.0 (75)
48 (1220)	7.0 (175)	8.0 (200)	7.0 (175)	3.2 (80)

For current information such as Safety Data Sheets (SDS), product data sheets, and other pertinent information, please go to the website at www.jm.com/industrial.com

1200°F - Operating Temperature				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
0.5 (15)	2.5 (65)	2.5 (65)	2.5 (65)	1.0 (25)
0.75 (20)	2.5 (65)	3.0 (80)	2.5 (65)	1.2 (30)
1.0 (25)	2.5 (65)	3.0 (80)	2.5 (65)	1.2 (30)
1.5 (40)	3.0 (80)	3.5 (90)	3.0 (80)	1.4 (35)
2 (50)	3.5 (90)	4.0 (100)	3.5 (90)	1.4 (35)
3 (80)	3.5 (90)	4.5 (115)	3.5 (90)	1.8 (45)
4 (100)	4.0 (100)	4.5 (115)	4.0 (100)	1.8 (45)
6 (150)	4.5 (115)	5.5 (140)	4.5 (115)	2.0 (50)
8 (200)	5.0 (125)	5.5 (140)	5.0 (125)	2.4 (55)
10 (250)	5.5 (140)	6.0 (150)	5.5 (140)	2.6 (60)

1200°F - Operating Temperature - continued				
NPS Pipe Size in (mm)	Preformed Insulation in (mm)			Blanket Insulation in (mm)
	Thermo-12® Gold	Sproule WR-1200®	MinWool-1200®	InsulThin™ HT
12 (300)	5.5 (140)	6.5 (165)	6.0 (150)	2.6 (65)
14 (350)	6.0 (150)	7.0 (175)	6.0 (150)	2.8 (70)
16 (400)	6.0 (150)	7.0 (175)	6.5 (165)	2.8 (70)
18 (450)	6.5 (165)	7.0 (175)	6.5 (165)	2.8 (70)
20 (500)	6.5 (165)	7.5 (190)	6.5 (165)	3.0 (75)
24 (600)	7.0 (175)	8.0 (200)	7.0 (175)	3.0 (75)
30 (750)	7.0 (175)	8.0 (200)	7.5 (190)	3.2 (80)
36 (900)	7.5 (190)	8.5 (215)	7.5 (190)	3.2 (80)
48 (1220)	8.0 (200)	9.0 (225)	8.0 (200)	3.50 (90)

Industrial Insulation Group, LLC manufactures MinWool-1200® mineral fiber pipe, block and a variety of other insulations; Thermo-12® Gold Calcium Silicate pipe and block insulation; Microporous Blanket Insulation; Super Firetemp® fireproofing board; SprouleWR-1200® Perlite pipe and block insulation; high-temperature adhesives, and insulating finishing cement. The physical and chemical properties presented herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Numerical flame spread and smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the Customer Service Office to assure current information. All Industrial Insulation Group products are sold subject to the Johns Manville Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville Limited Warranty and Limitation of Remedy, email info.industrial@jm.com.

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