

NF VALUE COMPARISON

Pipe Nom. size	Pipe Outer dia	Insu. Inner dia	NORMALIZED LOSS FACTOR (FOR INSULATION THICKNESS IN MM)															
			25	25	25	38	37	51	51	50	64	64	75	75	75	102	102	100
inches	mm	mm	NF(1)	NF(2)	NF(3)	NF(1)	NF(2)	NF(1)	NF(2)	NF(3)	NF(1)	NF(2)	NF(1)	NF(2)	NF(3)	NF(1)	NF(2)	NF(3)
1/2	21.3	22	5.23	5.20	5.16	4.11	4.14	3.58	3.58	3.58	3.09	3.23	2.89	3.00		2.61	2.66	
3/4	26.7	27	6.30	5.95	5.89	4.74	4.66	4.06	3.99	4.00	3.44	3.58	3.19	3.31	3.30	2.85	2.91	
1	33.4	34	6.54	6.87	6.91	5.18	5.30	4.41	4.49	4.56	3.93	3.99	3.61	3.67	3.71	3.19	3.20	
1 1/4	42.2	43	8.65	8.04		5.80	6.10	5.28	5.11		4.61	4.51	4.18	4.12		3.62	3.56	
1 1/2	48.3	49	8.62	8.84	8.74	6.60	6.65	5.10	5.53	5.54	4.57	4.85	4.20	4.42	4.41	3.66	3.80	
2	60.3	61	10.01	10.40	10.28	7.49	7.70	6.20	6.35	6.36	5.44	5.52	4.92	4.99	4.98	4.19	4.25	4.26
2 1/2	73.0	74	11.63	12.04	11.89	7.66	8.81	6.54	7.19	7.21	5.79	6.20	5.26	5.58	5.57	4.51	4.71	4.72
3	88.9	90	13.95	14.08	13.90	10.06	10.17	8.21	8.22	8.24	7.07	7.04	6.29	6.30	6.29	5.24	5.27	5.28
3 1/4	101.6	102	12.58	15.70		9.81	11.25	8.23	9.04		7.19	7.71	6.38	6.87		5.44	5.71	
4	114.3	115	16.55	17.32	17.08	12.08	12.33	9.76	9.85	9.88	8.34	8.36	7.26	7.43	7.42	6.08	6.13	6.15
4 1/2	127.0	128	15.20	18.93		11.71	13.40	9.72	10.66		8.29	9.01	7.42	7.98		6.15	6.56	
5	141.3	143	20.78	20.74		14.76	14.60	11.73	11.56		9.71	9.74	8.54	8.60		6.90	7.03	
6	168.3	180	32.11	24.15	23.82	20.57	16.86	15.07	13.26	13.30	12.42	11.11	10.70	9.76	9.74	8.38	7.91	7.93
7	193.7	196				18.94	18.98	14.94	14.85		12.51	12.39	10.55	10.85		8.62	8.73	
8	219.1	221			30.13	20.90	21.10	16.44	16.44	16.50	13.21	13.66	11.54	11.92	11.89	9.38	9.55	9.57
9	244.5	246				22.84	23.21	17.05	18.02		14.36	14.92	12.52	13.00		10.14	10.36	
10	278.0	275			36.82	24.44	26.00	19.27	20.10	19.86	16.09	16.59	13.93	14.41	14.17	11.17	11.42	11.29
11	298.4	300				26.29	27.69	20.70	21.37		17.25	17.60	14.91	15.26		11.93	12.06	
12	323.8	326			43.12	28.50	29.80	22.35	22.94	23.03	18.58	18.86	16.02	16.33	16.29	12.76	12.86	12.90
14	355.6	358			32.36	33.52	32.44	25.69	24.91	25.00	21.04	20.44	17.95	17.65	17.60	14.11	13.86	13.90

1.) Normalized Loss Factor is equal to $\frac{2 \times \text{Pi}}{\text{Log}_e(\text{Ins. outer dia./Ins. inner dia.})}$ and it is used for determining Pipe Heat Loss.

- 2.) However the inner and outer diameter of insulation varies from the theoretical values and the values published in Thermal Insulation hand book.
 - 3.) NF(1) is the Normalized loss Factor determined from inner and outer diameter of insulation from Thermal Insulation handbook by W. C. Turner & J. F. Malloy.
 - 4.) NF(2) is the normalized loss factor calculated considering pipe outer diameter as the insulation inner diameter and, added to it twice the insulation thickness, to determine the outer diameter of insulated pipe
 - 5.) NF(3) is the normalized loss factor as published in **BS:6351:Part 2**
 - 6.) NF(3) and NF(2) values match very closely and these values are greater than the values of NF(1).
- Thus, from the above finding, firstly it is safer to consider NF by calculation method i.e., by NF(2) way; and, Secondly the NF(1) which is generally based on actual values from manufacturers of insulation pipe section will result in lesser rate of heat loss during operation, thereby increasing the safety margin.