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FAX	+44 (0)161 633 2685
E-MAIL	info.uk@armacell.com
INTERNET	www.armacell.com

Insulation Thicknesses to Prevent Pipe Freezing

Given a -6°C ambient temperature and an initial water temperature of 7°C Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
10.0	2.9*	3.4*	3.8*	4.2*
12.0	4.2*	4.8*	5.4*	5.9*
15.0	6.1*	7.2*	8.1*	9.0*
22.0	11.3*	13.6	15.5	17.5
28.0	15.1	18.4	21.1	23.9
35.0	20.9	25.8	30.0	34.3
42.0	27.0	33.7	39.4	45.4
54.0	36.5	46.1	54.5	63.3
67.0	44.5	56.6	67.5	79.0
76.1	57.1	73.0	87.5	102.9
108.0	85.9	111.6	135.2	160.7

MDPE Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
20.0	6.8*	8.2*	9.3*	10.4*
25.0	10.4*	12.6	14.4	16.3
32.0	13.7	16.8	19.5	22.2
40.0	18.9	23.6	27.6	31.6
50.0	24.9	31.3	36.9	42.8
63.0	32.4	41.1	48.9	57.2
75.0	46.9	60.1	71.9	84.6
90.0	60.8	78.4	94.4	111.6
110.0	79.6	103.3	125.3	149.0
125.0	86.2	112.4	136.8	163.3

*Where the indicated protection from freezing provided by AF/Armaflex Class O is less than the recommended 12 hours, Armacell recommends trace heating be used.

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PHONE +44 (0)161 287 7100
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Insulation Thicknesses to Prevent Pipe Freezing

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Steel Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
17.2	5.2*	6.2*	6.9*	7.8*
26.9	10.5*	12.8	14.7	16.6
33.7	13.9	17.2	20.0	22.8
42.4	19.2	23.9	28.1	32.3
48.3	26.4	33.0	38.9	45.0
60.3	34.5	43.7	51.9	60.5
76.1	47.7	61.0	73.1	85.9
88.9	62.4	80.4	96.8	114.4
114.3	78.8	102.5	124.4	148.2

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -10ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
10.0	1.8*	2.1*	2.4*	2.6*
12.0	2.6*	2.9*	3.3*	3.7*
15.0	3.8*	4.4*	5.0*	5.6*
22.0	6.9*	8.4*	9.5*	10.7*
28.0	9.3*	11.3*	13.0	14.8
35.0	12.8	15.9	18.4	21.1
42.0	16.6	20.7	24.2	27.9
54.0	22.4	28.3	33.5	38.9
67.0	27.3	34.8	41.5	48.6
76.1	34.9	44.8	53.7	63.1
108.0	52.7	68.4	82.9	98.7

MDPE Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
20.0	4.2*	5.0*	5.7*	6.4*
25.0	6.4*	7.7*	8.9*	10.0*
32.0	8.4*	10.3*	12.0	13.6
40.0	11.6*	14.5	16.9	19.4
50.0	15.3	19.3	22.7	26.3
63.0	19.9	25.3	30.1	35.1
75.0	28.8	36.9	44.2	51.9
90.0	37.3	48.1	57.9	68.5
110.0	48.8	63.4	76.9	91.5
125.0	52.9	69.0	84.0	100.3

*Where the indicated protection from freezing provided by AF/Armaflex Class O is less than the recommended 12 hours, Armacell recommends trace heating be used.

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -10ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Steel Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
17.2	3.2*	3.8*	4.3*	4.8*
26.9	6.5*	7.9*	9.1*	10.3*
33.7	8.7*	10.7*	12.4	14.1
42.4	11.9*	14.8	17.4	19.9
48.3	16.2	20.4	24.0	27.8
60.3	21.2	26.9	32.0	37.3
76.1	29.3	37.6	45.0	52.9
88.9	38.3	49.4	59.5	70.3
108.0	41.4	53.4	64.7	76.9
114.3	48.5	63.0	76.6	91.2

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -15ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
10.0	1.2*	1.4*	1.6*	1.8*
12.0	1.7*	2.0*	2.3*	2.5*
15.0	2.6*	3.0*	3.4*	3.8*
22.0	4.7*	5.7*	6.5*	7.3*
28.0	6.3*	7.7*	8.8*	10.0*
35.0	8.7*	10.8*	12.5	14.3
42.0	11.3*	14.0	16.4	18.9
54.0	15.2	19.2	22.7	26.4
67.0	18.6	23.6	28.2	33.0
76.1	23.7	30.4	36.5	42.9
108.0	35.8	46.4	56.3	67.0

MDPE Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
20.0	2.8*	3.4*	3.9*	4.3*
25.0	4.3*	5.2*	6.0*	6.8*
32.0	5.7*	7.0*	8.1*	9.3*
40.0	7.9*	9.8*	11.5*	13.2
50.0	10.4*	13.1	15.4	17.9
63.0	13.5	17.2	20.4	23.9
75.0	19.6	25.0	30.0	35.2
90.0	25.3	32.6	39.3	46.5
110.0	33.1	42.9	52.2	62.1
125.0	35.9	46.8	57.0	68.0

*Where the indicated protection from freezing provided by AF/Armaflex Class O is less than the recommended 12 hours, Armacell recommends trace heating be used.

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PHONE	+44 (0)161 287 7100
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Insulation Thicknesses to Prevent Pipe Freezing

Given a -15ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Steel Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
17.2	2.2*	2.6*	3.0*	3.3*
26.9	4.4*	5.4*	6.2*	7.0*
33.7	5.9*	7.3*	8.5*	9.7*
42.4	8.1*	10.1*	11.8*	13.6
48.3	11.0*	13.9	16.3	18.9
60.3	14.5	18.3	21.8	25.4
76.1	19.9	25.5	30.6	36.0
88.9	26.0	33.6	40.4	47.8
108.0	28.0	36.3	44.1	52.4
114.3	32.9	42.8	52.0	61.9

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -20ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
10.0	0.9*	1.1*	1.2*	1.3*
12.0	1.3*	1.5*	1.7*	1.9*
15.0	1.9*	2.3*	2.6*	2.9*
22.0	3.6*	4.3*	4.9*	5.5*
28.0	4.8*	5.8*	6.7*	7.6*
35.0	6.6*	8.2*	9.5*	10.9*
42.0	8.6*	10.7*	12.5	14.4
54.0	11.6*	14.6	17.3	20.1
67.0	14.1	18.0	21.4	25.1
76.1	18.0	23.1	27.7	32.6
108.0	27.2	35.3	42.8	50.9

MDPE Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
20.0	2.2*	2.6*	3.0*	3.3*
25.0	3.3*	4.0*	4.6*	5.2*
32.0	4.3*	5.3*	6.2*	7.0*
40.0	6.0*	7.5*	8.7*	10.0*
50.0	7.9*	9.9*	11.7*	13.6
63.0	10.3*	13.0	15.5	18.2
75.0	14.8	19.0	22.8	26.8
90.0	19.2	24.8	29.9	35.3
110.0	25.1	32.7	39.6	47.2
125.0	27.2	35.5	43.3	51.7

*Where the indicated protection from freezing provided by AF/Armaflex Class O is less than the recommended 12 hours, Armacell recommends trace heating be used.

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PHONE	+44 (0)161 287 7100
FAX	+44 (0)161 633 2685
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INTERNET	www.armacell.com

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Given a -20ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Steel Pipe:

AF/Armaflex Class O Thickness				
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**	**32mm**
Total Freezing Time (Hours)				
17.2	1.7*	2.0*	2.3*	2.5*
26.9	3.4*	4.1*	4.7*	5.4*
33.7	4.5*	5.5*	6.4*	7.4*
42.4	6.2*	7.7*	9.0*	10.4*
48.3	8.4*	10.5*	12.4	14.4
60.3	11.0*	13.9	16.6	19.3
76.1	15.2	19.4	23.3	27.4
88.9	19.8	25.5	30.7	36.3
108.0	21.3	27.6	33.5	39.9
114.3	25.0	32.6	39.6	47.2

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -6ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when HT Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
10.0	2.7*	3.1*	3.4*
12.0	3.8*	4.4*	4.9*
15.0	5.6*	6.5*	7.4*
22.0	10.3*	12.3	14.0*
28.0	13.8	16.7	19.1
35.0	19.1	23.4	27.2
42.0	24.7	30.6	35.7
54.0	33.4	41.9	49.4
67.0	40.7	51.5	61.2
76.1	52.3	66.4	79.3
108.0	78.8	101.6	122.6

MDPE Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
20.0	6.2*	7.4*	8.4*
25.0	9.5*	11.4*	13.0
32.0	12.5	15.2	17.6
40.0	17.4	21.4	24.9
50.0	22.8	28.5	33.5
63.0	29.7	37.4	44.4
75.0	43.1	54.7	65.2
90.0	55.7	71.3	85.6
110.0	73.0	94.1	113.6
125.0	79.1	102.4	124.1

*Where the indicated protection from freezing provided by HT Armaflex is less than the recommended 12 hours, Armacell recommends trace heating be used.

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Given a -6ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when HT Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Steel Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
17.2	4.7*	5.6*	6.3*
26.9	9.6*	11.6*	13.3
33.7	12.8	15.7	18.1
42.4	17.6	21.7	25.4
48.3	24.1	30.0	35.3
60.3	31.6	39.7	47.0
76.1	43.7	55.5	66.3
88.9	57.2	73.1	87.7
108.0	61.2	78.9	95.2
114.3	72.3	93.3	112.8

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -10ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when HT Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
10.0	1.7*	1.9*	2.1*
12.0	2.3*	2.7*	3.0*
15.0	3.4*	4.0*	4.5*
22.0	6.3*	7.6*	8.6*
28.0	8.4*	10.2*	11.8*
35.0	11.7*	14.4	16.7
42.0	15.2	18.8	21.9
54.0	20.5	25.7	30.3
67.0	25.0	31.6	37.6
76.1	32.0	40.8	48.6
108.0	48.3	62.3	75.2

MDPE Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
20.0	3.8*	4.5*	5.2*
25.0	5.8*	7.0*	8.0*
32.0	7.7*	9.4*	10.8*
40.0	10.6*	13.1	15.3
50.0	14.0	17.5	20.6
63.0	18.2	23.0	27.2
75.0	26.4	33.5	40.0
90.0	34.2	43.7	52.5
110.0	44.7	57.7	69.7
125.0	48.5	62.8	76.1

*Where the indicated protection from freezing provided by HT Armaflex is less than the recommended 12 hours, Armacell recommends trace heating be used.

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Given a -10ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when HT Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Steel Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
17.2	2.9*	3.5*	3.9*
26.9	5.9*	7.2*	8.2*
33.7	7.9*	9.7*	11.2*
42.4	10.9*	13.4	15.7
48.3	14.9	18.5	21.7
60.3	19.4	24.5	29.0
76.1	26.9	34.2	40.8
88.9	35.1	44.9	53.9
108.0	37.7	48.6	58.6
114.3	44.4	57.4	69.4

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -15ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when HT Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
10.0	1.1*	1.3*	1.4*
12.0	1.6*	1.8*	2.0*
15.0	2.3*	2.7*	3.1*
22.0	4.3*	5.1*	5.9*
28.0	5.7*	6.9*	7.0*
35.0	8.0*	9.8*	11.3*
42.0	10.3*	12.7	14.9
54.0	13.9	17.4	20.6
67.0	17.0	21.5	25.5
76.1	21.7	27.6	33.0
108.0	32.7	42.2	51.0

MDPE Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
20.0	2.6*	3.1*	3.5*
25.0	3.9*	4.8*	5.4*
32.0	5.2*	6.4*	7.3*
40.0	7.2*	8.9*	10.4*
50.0	9.5*	11.9*	14.0
63.0	12.4	15.6	18.5
75.0	17.9	22.7	27.1
90.0	23.1	29.6	35.6
110.0	30.3	39.1	47.2
125.0	32.8	42.6	51.6

*Where the indicated protection from freezing provided by HT Armaflex is less than the recommended 12 hours, Armacell recommends trace heating be used.

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -15ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when HT Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Steel Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
17.2	2.0*	2.4*	2.7*
26.9	4.0*	4.9*	5.6
33.7	5.4*	6.6*	7.6*
42.4	7.4*	9.2*	10.7*
48.3	10.1*	12.6	14.8
60.3	13.2	16.6	19.7
76.1	18.2	23.2	27.7
88.9	23.8	30.5	36.6
108.0	25.6	33.0	39.9
114.3	30.2	39.0	47.1

*Where the indicated protection from freezing provided by HT Armaflex is less than the recommended 12 hours, Armacell recommends trace heating be used.

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PHONE	+44 (0)161 287 7100
FAX	+44 (0)161 633 2685
E-MAIL	info.uk@armacell.com
INTERNET	www.armacell.com

Insulation Thicknesses to Prevent Pipe Freezing

Given a -20ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when HT Armaflex is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
10.0	0.9*	1.0*	1.1*
12.0	1.2*	1.4*	1.6*
15.0	1.8*	2.1*	2.3*
22.0	3.3*	3.9*	4.4*
28.0	4.4*	5.3*	6.1*
35.0	6.0*	7.4*	8.6*
42.0	7.8*	9.7*	11.3*
54.0	10.6*	13.2	15.6
67.0	12.9	16.3	19.4
76.1	16.5	21.0	25.1
108.0	24.8	32.0	38.7

MDPE Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
20.0	2.0*	2.3*	2.7*
25.0	3.0*	3.6*	4.1*
32.0	4.0*	4.8*	5.6*
40.0	5.5*	6.8*	7.9*
50.0	7.2*	9.0*	10.6*
63.0	9.4*	11.8*	14.0
75.0	13.6	17.3	20.6
90.0	17.6	22.5	27.0
110.0	23.0	29.7	35.9
125.0	24.9	32.3	39.2

*Where the indicated protection from freezing provided by HT Armaflex is less than the recommended 12 hours, Armacell recommends trace heating be used.

REGISTERED OFFICE: Mars Street, Oldham, Lancs, OL9 6LY
REGISTRATION N°: 3729805 **VAT REG N°: G.B.** 759 3872 74

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advanced insulation

PHONE	+44 (0)161 287 7100
FAX	+44 (0)161 633 2685
E-MAIL	info.uk@armacell.com
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Steel Pipe:

HT Armaflex Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
17.2	1.5*	1.8*	2.0*
26.9	3.1*	3.7*	4.3*
33.7	4.1*	5.0*	5.8*
42.4	5.6*	7.0*	8.1*
48.3	7.7*	9.6*	11.2*
60.3	10.0*	12.7	15.0
76.1	13.9	17.6	21.1
88.9	18.1	23.2	27.8
108.0	19.5	25.1	30.3
114.3	22.9	29.6	35.8

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -6ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Tubolit is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
10.0	2.9*	3.3*	3.7*
12.0	4.1*	4.7*	5.3*
15.0	6.0*	7.0*	7.9*
22.0	11.0*	13.3	15.1
28.0	14.7	17.9	20.6
35.0	20.4	25.2	29.2
42.0	26.4	32.8	38.4
54.0	35.7	44.9	53.1
67.0	43.5	55.2	65.8
76.1	55.8	71.2	85.3

MDPE Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
20.0	6.6*	7.9*	9.0*
25.0	10.1*	12.3	14.1
32.0	13.4	16.4	19.0
40.0	18.5	23.0	26.8
50.0	24.4	30.6	36.0
63.0	31.7	40.1	47.7
75.0	45.9	58.6	70.2

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Given a -6ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Tubolit is used. Local water supply regulations recommend providing at least 12 hours protection.

Steel Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
17.2	5.1*	6.0*	6.8*
26.9	10.3*	12.5	14.3
33.7	13.7	16.8	19.5
42.4	18.8	23.3	27.3
48.3	25.8	32.2	37.9
60.3	33.7	42.6	50.6
76.1	46.6	59.5	71.3

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FAX	+44 (0)161 633 2685
E-MAIL	info.uk@armacell.com
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Insulation Thicknesses to Prevent Pipe Freezing

Given a -10ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Tubolit is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
10.0	1.8*	2.1*	2.3*
12.0	2.5*	2.9*	3.3*
15.0	3.7*	4.3*	4.9*
22.0	6.8*	8.1*	9.3*
28.0	9.0*	11.0*	12.7
35.0	12.5	15.5	18.0
42.0	16.2	20.1	23.6
54.0	21.9	27.6	32.6
67.0	26.7	33.9	40.5
76.1	34.2	43.7	52.3

MDPE Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
20.0	4.1*	4.9*	5.6*
25.0	6.2*	7.5*	8.6*
32.0	8.2*	10.1*	11.7*
40.0	11.4*	14.1	16.5
50.0	15.0	18.8	22.1
63.0	19.4	24.7	29.3
75.0	28.2	36.0	43.1

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -10ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Tubolit is used. Local water supply regulations recommend providing at least 12 hours protection.

Steel Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
17.2	3.1*	3.7*	4.2*
26.9	6.3*	7.7*	8.9*
33.7	8.5*	10.4*	12.1
42.4	11.6	14.4	16.9
48.3	15.9	20.0	23.4
60.3	20.8	26.3	31.2
76.1	28.7	36.6	43.9

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PHONE +44 (0)161 287 7100
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E-MAIL info.uk@armacell.com
INTERNET www.armacell.com

Insulation Thicknesses to Prevent Pipe Freezing

Given a -15ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Tubolit is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
10.0	1.2*	1.4*	1.6*
12.0	1.7*	2.0*	2.2*
15.0	2.5*	2.9*	3.3*
22.0	4.6*	5.5*	6.3*
28.0	6.1*	7.5*	8.6*
35.0	8.5*	10.5*	12.2
42.0	11.0	13.7	16.0
54.0	14.9	18.7	22.1
67.0	18.1	23.0	27.5
76.1	23.2	29.7	35.5

MDPE Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
20.0	2.8*	3.3*	3.8*
25.0	4.2*	5.1*	5.9*
32.0	5.6*	6.8*	7.9*
40.0	7.7*	9.6*	11.2*
50.0	10.2*	12.7	15.0
63.0	13.2	16.7	19.9
75.0	19.1	24.4	29.2

*Where the indicated protection from freezing provided by Tubolit is less than the recommended 12 hours, Armacell recommends trace heating be used.

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FAX +44 (0)161 633 2685
E-MAIL info.uk@armacell.com
INTERNET www.armacell.com

Insulation Thicknesses to Prevent Pipe Freezing

Given a -15ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Tubolit is used. Local water supply regulations recommend providing at least 12 hours protection.

Steel Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
17.2	2.1*	2.5*	2.9*
26.9	4.3*	5.3*	6.0*
33.7	5.8*	7.1*	8.2*
42.4	7.9*	9.8*	11.5*
48.3	10.8*	13.5	15.9
60.3	14.1	17.9	21.2
76.1	19.5	24.9	29.8

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Insulation Thicknesses to Prevent Pipe Freezing

Given a -20ºC ambient temperature and an initial water temperature of 7ºC Armacell has calculated (in accordance with BS EN ISO 12241) the following freezing times of pipework when Tubolit is used. Local water supply regulations recommend providing at least 12 hours protection.

Copper Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
10.0	0.9*	1.1*	1.2*
12.0	1.3*	1.5*	1.7*
15.0	1.9*	2.2*	2.5*
22.0	3.5*	4.2*	4.8*
28.0	4.7*	5.7*	6.5*
35.0	6.5*	8.0*	9.3
42.0	8.3	10.4	12.2
54.0	11.3	14.2	16.8
67.0	13.8	17.5	20.9
76.1	17.6	22.5	27.0

MDPE Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
20.0	2.1*	2.5*	2.9*
25.0	3.2*	3.9*	4.5*
32.0	4.2*	5.2*	6.0*
40.0	5.9*	7.3*	8.5*
50.0	7.7*	9.7*	11.4*
63.0	10.0*	12.7	15.1
75.0	14.5	18.5	22.2

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Steel Pipe:

Tubolit Thickness			
Pipe O.D (mm)	**13mm**	**19mm**	**25mm**
Total Freezing Time (Hours)			
17.2	1.6*	1.9*	2.2*
26.9	3.3*	4.0*	4.6*
33.7	4.4*	5.4*	6.3*
42.4	6.0*	7.5*	8.8*
48.3	8.2*	10.3*	12.1
60.3	10.7	13.6	16.2
76.1	14.8	18.9	22.7

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