

Freeze protection using Armacell insulation products

The theory of freeze protection is quite straightforward — use insulation to maintain the temperature of the fluid in the pipe above the freezing point of the fluid. The freezing point of water is 32°F or 0°C. Insulation will reduce heat transfer from the cold surroundings to the fluid in the pipes hence, prolonging the time for the fluid to reach the freezing point.

It is important to understand that when the water is stagnant and the temperature is below freezing, insulation alone can

only delay freezing for a certain amount of time depending on the insulation thickness, ambient temperature and the initial water temperature. In order to prevent freezing indefinitely, the line must be insulated and either the water must be continuously flowing or heat trace or tape must be added.

There are many types of heat tapes and heat traces available in the market. Generally, Armacell products can be installed over any heat trace that operates below 200°F but it is recommended that the manufacturers of heat traces

and heat tapes be contacted to select the proper product for the application. It is important that the thickness of the heat trace/tape be taken into account when calculating the inner diameter of the insulation. The inner diameter of the insulation must fit properly over the heat trace/tape and pipe. It is important to cover all exposed piping including valves and faucets with insulation. Exposed surfaces may result in localized freezing.

Time for 50% Ice Formation in hours		
Ambient Temperature, °F	Insulation Thickness (inches)	
	3/8	1/2
0	2.25	2.55
10	3.24	3.67
20	5.87	6.66
30	33.38	37.84

Line Temperature 40°F, pipe diameter 5/8"

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