

# TRYMER Insulation Design Table for Refrigeration Indoors



ambient temp. = 90°F  
 ambient relative humidity = 80%  
 dewpoint = 83°F

Outer surface = PVC ( $\epsilon = 0.9$ )  
 wind velocity = 0 mph  
 geometry = Horizontal Pipe

Insulation Thickness In Inches Necessary to Prevent Condensation  
 Or limit Heat Gain to 8 btu/hr-ft<sup>2</sup>, whichever is greater

| Nom pipe size (in) | Service Temperature (°F) |     |     |     |      |     |     |     |
|--------------------|--------------------------|-----|-----|-----|------|-----|-----|-----|
|                    | +100                     | 50  | -50 | -40 | -20  | 0   | 20  | 40  |
| 0.5                | 2                        | 2   | 2   | 1.5 | 1.5  | 1.5 | 1   | 1   |
| 0.75               | 2.5                      | 2.5 | 2   | 2   | 1.5  | 1.5 | 1   | 1   |
| 1                  | 2.5                      | 2.5 | 2   | 2   | 1.45 | 1.5 | 1   | 1   |
| 1.25               | 2.5                      | 2.5 | 2   | 2   | 1.5  | 1.5 | 1   | 1   |
| 1.5                | 2.5                      | 2.5 | 2   | 2   | 1.5  | 1.5 | 1   | 1   |
| 2                  | 2.5                      | 2.5 | 2.5 | 2   | 2    | 1.5 | 1.5 | 1   |
| 2.5                | 2.5                      | 2.5 | 2.5 | 2   | 2    | 1.5 | 1.5 | 1   |
| 3                  | 3                        | 2.5 | 2.5 | 2   | 2    | 1.5 | 1.5 | 1   |
| 4                  | 3                        | 3   | 2.5 | 2.5 | 2    | 1.5 | 1.5 | 1   |
| 5                  | 3.5                      | 3   | 2.5 | 2.5 | 2    | 1.5 | 1.5 | 1   |
| 6                  | 3.5                      | 3   | 3   | 2.5 | 2    | 2   | 1.5 | 1   |
| 8                  | 3.5                      | 3   | 3   | 2.5 | 2    | 2   | 1.5 | 1   |
| 10                 | 3.5                      | 3.5 | 3   | 2.5 | 2    | 2   | 1.5 | 1   |
| 12                 | 3.5                      | 3.5 | 3   | 2.5 | 2    | 2   | 1.5 | 1   |
| 14                 | 4                        | 3.5 | 3   | 3   | 2.5  | 2   | 1.5 | 1   |
| 16                 | 4                        | 3.5 | 3   | 3   | 2.5  | 2   | 1.5 | 1   |
| 18                 | 4                        | 3.5 | 3   | 3   | 2.5  | 2   | 1.5 | 1   |
| 20                 | 4                        | 3.5 | 3   | 3   | 2.5  | 2   | 1.5 | 1   |
| Tank Side          | 4.5                      | 4   | 3.5 | 3   | 2.5  | 2   | 1.5 | 1.5 |
| Tank Top           | 4.5                      | 4   | 3.5 | 3   | 2.5  | 2   | 1.5 | 1.5 |
| Tank Bottom        | 4.5                      | 4   | 3.5 | 3   | 2.5  | 2   | 1.5 | 1.5 |

This table is based on the ASTM C-680 algorithm for thickness of insulation required to control condensation on the outer surface of an insulated pipe, as used in the 3E PLUS program. The required insulation thickness values do not include a safety factor. Actual operating conditions can vary. Consult a design engineer for an appropriate safety factor.