



PROCESS  
INDUSTRY  
PRACTICES

COMPLETE REVISION  
*October 2017*

***Insulation***

**PIP INSC1000  
Cold Service Insulation Materials and  
Installation Specification**

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## PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by the Practice.

This Practice is subject to revision at any time.

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### **PUBLISHING HISTORY**

<i>October 1997</i>	<i>Issued</i>	<i>July 2007</i>	<i>Editorial Revision</i>	<i>April 2012</i>	<i>Editorial Revision</i>
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# PIP INSC1000 Cold Service Insulation Materials and Installation Specification

## Table of Contents

**1. Scope .....3**

**2. References .....3**

2.1 Process Industry Practices .....3

2.2 Industry Codes and Standards .....3

**3. Definitions .....3**

**4. Requirements .....4**

4.1 Project Scope .....4

4.2 Materials .....4

4.3 Storage and Handling of Insulation  
Materials .....5

4.4 Installation Requirements .....5

4.5 Quality Plan .....12

4.6 Inspection .....12

4.7 Repairs .....13

## Data Forms

**INSC1000-D1** – Documentation Requirements  
Sheet

*The following data forms shall be part of this  
Practice only if indicated on the purchaser's  
completed Documentation Requirements Sheet.*

**INSC1000-D2** – Cold Service Insulation System  
Project-Specific Requirements

**INSC1000-D3** – Extent of Cold-Service  
Insulation

**INSC1000-D10** – Cellular Glass Block and  
Fabricated Sections Insulation System

**INSC1000-D11** – Polyisocyanurate Insulation  
System

**INSC1000-D12** – Rigid Cellular Phenolic  
Thermal Insulation System for Pipe and  
Equipment

**INSC1000-D13** – Flexible Elastomeric Cellular  
Thermal Insulation System for Pipe and  
Equipment

**INSC1000-D14** – User-Defined Insulation  
System for Pipe and Equipment

**INSC1000-F1** – Insulation Thickness Table –  
Cellular Glass Insulation for CC, ASTM  
C552 Grade I (inches)

**INSC1000-F2** – Insulation Thickness Table –  
Cellular Glass Insulation for CP, ASTM  
C552 Grade I (inches)

**INSC1000-F3** – Insulation Thickness Table –  
Cellular Glass Insulation, Combined Table,  
ASTM C552 Grade I (inches)

**INSC1000-F4** – Insulation Thickness Table –  
Polyisocyanurate Insulation for CC, ASTM  
C591 Grade 2 (inches)

**INSC1000-F5** – Insulation Thickness Table –  
Polyisocyanurate Insulation for CP, ASTM  
C591 Grade 2 (inches)

**INSC1000-F6** – Insulation Thickness Table – Polyisocyanurate Insulation, Combined Table, ASTM C591 Grade 2 (inches)

**INSC1000-F7** – Insulation Thickness Table – Rigid Cellular Phenolic Insulation for CC, ASTM C1126, Type III, Grade 1 (inches)

**INSC1000-F8** – Insulation Thickness Table – Rigid Cellular Phenolic Insulation for CP, ASTM C1126, Type III, Grade 1 (inches)

**INSC1000-F9** – Insulation Thickness Table – Rigid Cellular Phenolic Insulation, Combined Table, ASTM C1126, Type III, Grade 1 (inches)

**INSC1000-F10** – Insulation Thickness Table – Flexible Elastomeric Cellular Insulation for CC, ASTM C534, Grade 1 (inches)

**INSC1000-F11** – Insulation Thickness Table – Flexible Elastomeric Cellular Insulation for CP, ASTM C534, Grade 1 (inches)

**INSC1000-F12** – Insulation Thickness Table – Flexible Elastomeric Cellular Insulation, Combined Table, ASTM C534, Grade 1 (inches)

**INSC1000-F13** – User-Defined Insulation for CC (inches)

**INSC1000-F14** – User-Defined Insulation – for CP (inches)

**INSC1000-F15** – User-Defined Insulation – Combined Table (inches)

**INSC1000-FM1** – Insulation Thickness Table – Cellular Glass Insulation for CC, ASTM C552 Grade I (mm)

**INSC1000-FM2** – Insulation Thickness Table – Cellular Glass Insulation for CP, ASTM C552 Grade I (mm)

**INSC1000-FM3** – Insulation Thickness Table – Cellular Glass Insulation, Combined Table, ASTM C552 Grade I (mm)

**INSC1000-FM4** – Insulation Thickness Table – Polyisocyanurate Insulation for CC, ASTM C591 Grade 2 (mm)

**INSC1000-FM5** – Insulation Thickness Table – Polyisocyanurate Insulation for CP, ASTM C591 Grade 2 (mm)

**INSC1000-FM6** – Insulation Thickness Table – Polyisocyanurate Insulation, Combined Table, ASTM C591 Grade 2 (mm)

**INSC1000-FM7** – Insulation Thickness Table – Rigid Cellular Phenolic Insulation for CC, ASTM C1126, Type III, Grade 1 (mm)

**INSC1000-FM8** – Insulation Thickness Table – Rigid Cellular Phenolic Insulation for CP, ASTM C1126, Type III, Grade 1 (mm)

**INSC1000-FM9** – Insulation Thickness Table – Rigid Cellular Phenolic Insulation, Combined Table, ASTM C1126, Type III, Grade 1 (mm)

**INSC1000-FM10** – Insulation Thickness Table – Flexible Elastomeric Cellular Insulation for CC, ASTM C534, Grade 1 (mm)

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**INSC1000-FM12** – Insulation Thickness Table – Flexible Elastomeric Cellular Insulation, Combined Table, ASTM C534, Grade 1 (mm)

**INSC1000-FM13** – User-Defined Insulation for CC (mm)

**INSC1000-FM14** – User-Defined Insulation for CP (mm)

**INSC1000-FM15** – User-Defined Insulation – Combined Table (mm)

## 1. Scope

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This Practice provides requirements for materials and installation of cold service insulation systems.

This Practice describes requirements for cold service insulation materials and accessories, storage and handling of materials, insulation application, extent of insulation, and documentation on the external surfaces of piping and equipment, ambient to -179°C (-290°F).

*Comment:* Use of this Practice for contractual purposes requires the purchaser to make specific choices and to assemble additional supporting documents. Listing of or reference to supporting documents within this Practice does not imply suitability for specific designs.

## 2. References

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Applicable parts of the following Practices and industry codes and standards references shall be considered an integral part of this Practice. The edition in effect on the date of contract award shall be used, except as otherwise noted. Short titles are used herein where appropriate.

### 2.1 Process Industry Practices (PIP)

- PIP INTG1000 – *Insulation Inspection Checklist*

### 2.2 Industry Codes and Standards

- American Petroleum Institute (API)
  - API 521 – *Pressure-Relieving and Depressuring Systems*
- American Society for Testing and Materials (ASTM)
  - ASTM C450 – *Standard Practice for Fabrication of Thermal Insulating Fitting Covers for NPS Piping, and Vessel Lagging*
  - ASTM C692 – *Standard Test Method for Evaluating the Influence of Thermal Insulation on External Stress Corrosion Cracking Tendency of Austenitic Stainless Steel*
  - ASTM C795 – *Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel*
  - ASTM C871 – *Standard Test Methods for Chemical Analysis of Thermal Insulation Materials for Leachable Chloride, Fluoride, Silicate and Sodium Ions*

## 3. Definitions

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*owner:* Party who owns the facility wherein the insulation system will be used

*purchaser:* Party who awards the contract to the supplier. The purchaser may be the owner or the owner's authorized agent.

*supplier:* Party responsible for providing the insulation materials and installing the insulation system