

Polyethylene Pipe and Fittings for Water-Based Ground-Source “Geothermal” Heat Pump Systems

**NSF International Standard/
American National Standard**



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NSF International Standard/
American National Standard
for Plastics –

**Polyethylene Pipe and Fittings for
Water-Based Ground-Source
“Geothermal” Heat Pump Systems**

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Foreword²

Geothermal technology has been used in North America for decades and is experiencing tremendous interest. In 2009, the NSF Joint Committee on Plastics and RV Plumbing Components proposed to develop this Standard after a need was identified in the industry. Plastic piping system components are used in the construction of earth energy systems yet there is no North American standard addressing all relevant aspects of earth energy systems. It is the intent of this Standard to assist in a more consistent approval and mainstream code adoption of the geothermal piping systems technology.

This Standard will be separated into four separate documents based on material types. NSF/ANSI 358-1 addresses products in polyethylene systems.

This edition of NSF/ANSI 358-1 includes the following revisions:

Issue 2

This issue updated normative references in section 2, language in section 5.3, editorial correction in sections 6.1, 6.3.1 and 6.3.2, and updates to table 4.

This Standard was developed by the NSF Joint Committee on Plastics using the consensus process described by the American National Standards Institute.

Suggestions for improvement of this Standard are welcome. This Standard is maintained on a Continuous Maintenance schedule and can be opened for comment at any time. Comments should be sent to Chair, Joint Committee on Plastics at standards@nsf.org or, c/o NSF International, Standards Department, P.O. Box 130140, Ann Arbor, Michigan, 48113-0140, USA.

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for Plastics –

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1 General

1.1 Purpose

This Standard establishes the minimum physical and performance requirements for plastic piping system components. These criteria were established for the protection of property, public health and the environment.

1.2 Scope

The physical and performance requirements in this Standard apply to plastic piping system components as well as non-plastic components of the ground loop heat exchanger including, but not limited to, pipes and fittings used in water-based ground-source heat pump systems. This Standard is intended for ground loop heat exchangers with a maximum temperature and pressure of 140 °F (60 °C) at 100 psi. Water-based ground-source heat pump systems commonly include the use of anti-freeze, heat transfer fluids or other chemical additives. This Standard does not cover refrigerant based ground loop heat exchangers such as direct expansion (DX) systems. This Standard does not cover hydronic heating or cooling systems within buildings.

2 Normative references

The following documents contain provisions that, through reference, constitute provisions of this NSF Standard. At the time this Standard was balloted, the editions listed below were valid. All documents are subject to revision, and parties are encouraged to investigate the possibility of applying the recent editions of the documents indicated below. The most recent published edition of the document shall be used for undated references.

ASTM D2290-12. *Standard Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe by Split Disk Method*³

ASTM F1588-96(2011). *Standard Test Method for Constant Tensile Load Joint Test (CTLJT)*³

ASTM D2683-10e1. *Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing*³

ASTM D2737-12a. *Standard Specification for Polyethylene (PE) Plastic Tubing*³

ASTM D2837-11. *Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe*

³ American Society for Testing Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 <www.astm.org>.