

# **GUIDE TO CHLORINE RESISTANCE RATINGS OF PEX PIPES AND TUBING FOR POTABLE WATER APPLICATIONS**

**TN-53**

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# Foreword

## GUIDE TO CHLORINE RESISTANCE RATINGS OF PEX PIPES AND TUBING FOR POTABLE WATER APPLICATIONS

This technical note was developed and published with the technical help and financial support of the members of the Plastics Pipe Institute (PPI). These members have shown their commitment to developing and improving quality products by assisting standards development organizations in the development of standards, and also by developing design aids and reports to help engineers, code officials, specifying groups, contractors and users.

The purpose of this technical note is to provide information to the end user regarding the use of PEX tubing in chlorinated potable water applications.

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## 1.0 SCOPE

The intent of this Technical Note is to give guidance to plumbing system designers, installers and specifiers for understanding chlorine resistance ratings as applied to crosslinked polyethylene (PEX) pipes and tubing for potable water applications, and to describe the effects of using PEX pipes and tubing in operating conditions beyond these published ratings.

The information in this Technical Note is provided to explain how PEX pipe and tubing conforming to standards such as ASTM F876, ASTM F2788 and CSA B137.5 may be used safely in potable hot- and cold-water distribution systems, within specific limits discussed within this TN. This Technical Note is also intended to clarify that the typical hydrostatic pressure and temperature ratings for PEX tubing (e.g. 160 psi @ 73°F, 100 psi @ 180°F) are not to be confused with the pressure and temperature ratings for use in hot chlorinated potable water systems.

*Note 1: For PEX materials, “tubing” refers to products whereby the actual outside diameter (OD) is 1/8 inch larger than the nominal size, and is described as copper tube size (CTS). Product standards ASTM F876 and CSA B137.5 apply to PEX tubing. “Pipe” refers to products whereby the actual OD matches that of steel pipe of the same nominal size and is described as iron pipe size (IPS), or products where the actual OD matches the nominal size. ASTM F2788 applies to PEX pipe. The terms “pipe” and “piping”, as well as “tube” and “tubing”, are used interchangeably in this document.*

*Note 2: See PPI TN-52 GUIDE TO HIGH-TEMPERATURE APPLICATIONS OF NON-POTABLE PEX PIPE AND TUBING SYSTEMS for explanation of hydrostatic pressure ratings and considerations for use in non-chlorinated water systems operating at temperatures above 180°F (82°C).*

## 2.0 BACKGROUND

The plastic piping industry is highly regulated within USA and Canada, with systems of codes, standards and third-party certifications which are extremely rigorous with regards to tubing materials (ingredients), production controls and finished products. For PEX tubing and materials, chlorine resistance is tested and evaluated in accordance with ASTM F2023 “Standard Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Pipe, Tubing and Systems to Hot Chlorinated Water”.