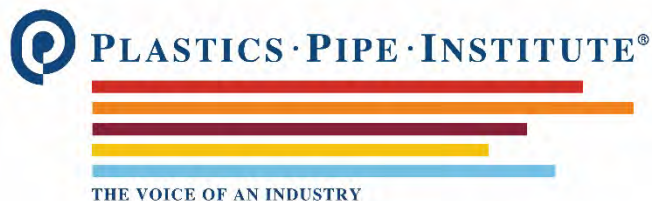


Proper Integration of Copper Tubing and Components with PP-R Piping Materials for Plumbing Applications

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Foreword

PROPER INTEGRATION OF COPPER TUBING AND COMPONENTS WITH PP-R PIPING MATERIALS FOR PLUMBING 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 regarding proper integration of copper tubing and components with random copolymerized polypropylene (PP-R) piping materials for plumbing applications. While this technical note is specific to PP-R piping materials, the recommendations regarding proper design, sizing, and operation of systems with copper tubing and components may also be applicable to other plastic piping materials approved for plumbing applications.

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1.0 INTRODUCTION

Random copolymerized polypropylene (PP-R) is a high-temperature plastic pressure piping system used for plumbing and hydronic heating and cooling applications. PP-R was launched in the 1980s in Europe, then introduced to North America in the 2000s.

PP-R product standards include:

- ASTM F2389 *Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems*, first published in 2004 www.astm.org
- CSA B137.11 *Polypropylene (PP-R) pipe and fittings for pressure applications*, first published in 1993 www.shopcsa.ca

This Technical Note will explain how improper or excessive flow rates within mixed-material plumbing systems that contain both copper materials (i.e. tubing, fittings, valves) combined with PP-R piping materials can result in premature failure of both the copper components and the PP-R materials, potentially resulting in plumbing system leaks.

These concerns do not apply to copper alloy materials, such as brass or bronze, or to cold-water plumbing, hydronic systems, closed-loop geothermal systems or industrial piping systems.

This Technical Note will explain the conditions that can result in premature failure of copper or PP-R piping materials, and how to avoid these problems through proper design, sizing and balancing of plumbing systems.

Note 1: While this technical note is specific to PP-R piping materials, the recommendations regarding proper sizing of and intergrating with copper tubing and components may also be applicable to other plastic piping materials approved for plumbing applications.

Note 2: For more information about proper sizing of copper plumbing systems and the potential for corrosion of copper, see the *Copper & Copper Alloy Corrosion Resistance Database* available from the Copper Development Association at www.copper.org and the Canadian Copper & Brass Development Association at <http://en.coppercanada.ca/>.

2.0 TECHNICAL DEFINITIONS

Corrosion: Chemical attack on the surface of a metal forming a more stable ionic material, most commonly the electrochemical oxidation of metal through attack by oxygen, chlorine, sulfur, or other oxidizing agents.

Erosion: The process of gradual destruction of a material or surface through wear or surface abrasion, sometimes caused by excessive flow velocities in piping systems.