Installation of Plastic Pressure Piping Materials Near IC-Rated and Non-IC-Rated Recessed Lighting Fixtures

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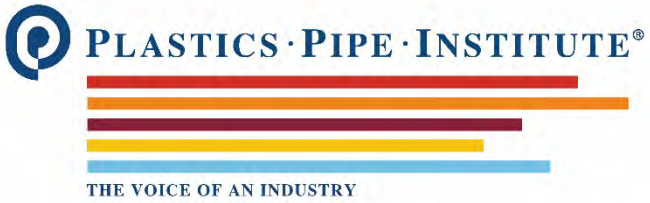

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Foreword

INSTALLATION OF PLASTIC PRESSURE PIPING MATERIALS NEAR

IC-RATED AND NON-IC-RATED RECESSED LIGHTING FIXTURES

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 the installation of plastic pressure pipe materials used for applications such as hot- and cold-water plumbing, fire protection and hydronic heating or cooling systems, in the vicinity of recessed light fixtures.

The PPI has prepared this technical note as a service to the industry. The information in this note is offered in good faith and believed to be accurate at the time of its preparation, but is offered “as is” without any express or implied warranty, including WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Additional information may be needed in some areas, especially with regard to unusual or special applications. Consult the manufacturer or material supplier for more detailed information. A list of member manufacturers is available on the PPI website. PPI does not endorse the proprietary products or processes of any manufacturer and assumes no responsibility for compliance with applicable laws and regulations.

PPI intends to revise this technical note within 5 years or sooner if required, from the date of its publication, in response to comments and suggestions from users of the document. Please send suggestions of improvements to the address below. Information on other publications can be obtained by contacting PPI directly or visiting our website.

The Plastics Pipe Institute, Inc.

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INSTALLATION OF PLASTIC PRESSURE PIPING MATERIALS NEAR IC-RATED AND NON-IC-RATED RECESSED LIGHTING FIXTURES

1.0 INTRODUCTION

This Technical Note will provide guidance about the recommended proximity of certain types of plastic pressure pipe and tubing to various types of recessed lighting fixtures, which are also known as “pot lights” or “can lights”.

Recessed light fixtures are available in two classes, non-insulation contact and insulation contact (i.e. IC-rated).

This Technical Note applies to the following types of plastic pressure pipes and tubing:

- CPVC: *Chlorinated polyvinyl chloride*
- PEX: *Crosslinked polyethylene*
- PE-RT: *Polyethylene of raised temperature*
- PP-R: *Random copolymerized polypropylene*
- PP-RCT: *Polypropylene random copolymer with modified crystallinity & temperature resistance*

These materials are commonly used in applications such as hot- and cold-water plumbing, fire protection, and hydronic heating and cooling, including radiant heating and cooling systems. The information within this document may apply differently to each of these materials.

Note 1: For more information about non-IC-rated and IC-rated lighting, contact lighting trade associations such as the Illuminating Engineering Society of North America (www.ies.org) and the National Electrical Manufacturers Association (www.nema.org).

2.0 DISCUSSION

Plastic pipes and tubing (“pipes”) in both residential and commercial plumbing, residential fire protection, and most hydronic applications are typically required to have pressure ratings at 180°F (82°C) operating temperature. Pipes approved for such applications will have their operating pressure at 180°F included in the pipe markings.

In certain construction situations, these plastic pipes may be installed near recessed light fixtures in ceilings. These recessed light fixtures are typically classed as IC-rated (insulation contact) or non-IC-rated (no insulation contact). Light fixtures that are evaluated to the UL 1598[1] standard for an IC rating may have exterior temperatures as high as 194°F (90°C).

[1] *UL 1598 Standard for Safety Luminaires* available from Underwriters Laboratories at www.UL.com

The plastic pipes included in this Technical Note (e.g. CPVC, PEX, PE-RT, PP {PP-R and PP-RCT}) will not melt at 194°F, and they will typically retain sufficient pressure rating to exceed the service requirements of the installation at this temperature. However, frequently repeated or long-term exposure to air or surface temperatures above 180°F may have negative effects on certain plastic pipe materials, potentially leading to premature failure.

For this reason, it is recommended, even with IC-rated light fixtures, that the pipe installer allow adequate spacing around plastic pipes to install enough insulation to assure that the surface temperature of the plastic pipe is kept to 180°F or less. See Section 3.0 RECOMMENDATIONS for details.

According to UL 1598, recessed light fixtures that are not IC-rated may have surface temperatures as high as 300°F (150°C), and it is imperative that plastic pipes be protected from exposure to this temperature. This can be accomplished by:

1. Installing the pipes with adequate space from the recessed light fixture,
2. Installing insulation between the pipe and recessed light fixtures, keeping in mind that the insulation should not contact a non-IC-rated fixture, or
3. Some combination of both.

CAUTION! If any plumbing supply pipe is installed too close to a hot light fixture, the ambient heat from the fixture may heat the water within the pipe, possibly delivering a short burst of excessively hot water to a user of the plumbing system, and potentially scalding him or her. This is a potentially dangerous situation, regardless of which type of plumbing pipe material is used.

3.0 RECOMMENDATIONS

If the plastic pipe manufacturer has published recommendations regarding the proper installation of their pipe in the vicinity of recessed light fixtures, PPI recommends that those recommendations be followed.

In the absence of specific recommendations from the plastic pipe manufacturer related to IC-rated or non-IC-rated lights, follow the most relevant recommendation/s below, starting with 3.1:

3.1 Protection of Plastic Pipe and Tubing with Distance

It is recommended that, even with IC-rated recessed light fixtures, the pipe installer should ensure that adequate spacing exists so that the surface temperature of the plastic pipe is kept to 180°F (82°C) or less when lights are in operation and the environment surrounding the pipes represents a typical situation of the building when occupied (e.g. after construction is complete and the space is heated).

See **Figure 1** for illustration.

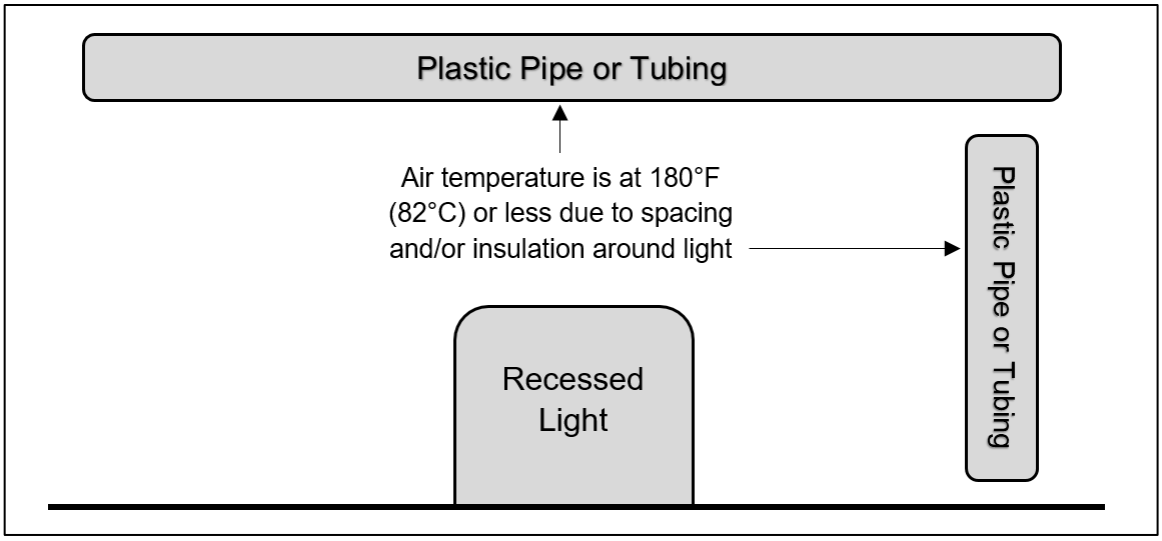

Figure 1: Protecting plastic pipe or tubing against excessive air temperature with distance

3.2 Protection of Plastic Pipe and Tubing with Insulation

If an air space is not enough to ensure that the surface temperature of the pipe is 180°F (82°C) or less, then pipe installers should protect the pipe with adequate thickness of insulation, of a type that is approved by the pipe manufacturer for use with the specific type of pipe *and* recommended by the insulation manufacturer for that type of installation, to ensure that the surface temperature of the pipe is 180°F or less, in typical operating conditions as described in 3.1.

See **Figure 2** for illustration.

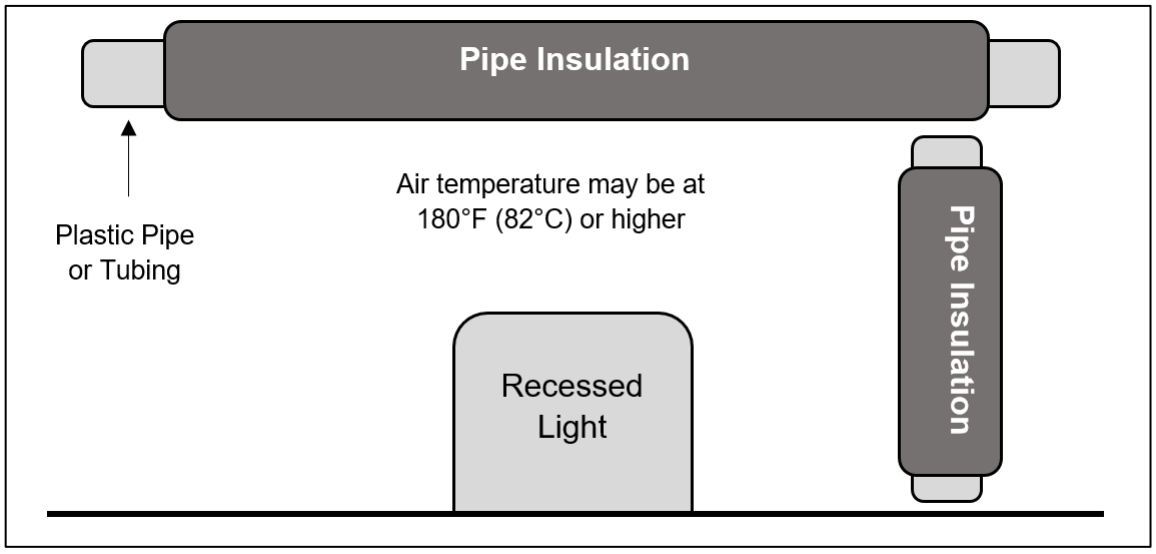

Figure 2: Protecting plastic pipe or tubing against excessive air temperature with approved insulation

3.3 Protection of PEX, PE-RT or PP Pipe or Tubing with Default Spacing

In the absence of specific recommendations from the pipe manufacturer or an inability to measure the pipe surface temperature near the closest recessed lights while in operation, for PEX, PE-RT, and PP (PP-R and PP-RCT) pipe and tubing materials the pipe installer should maintain a minimum space of 6 inches (15 cm) horizontally and 12 inches (30 cm) vertically between non-insulated plastic pipe and recessed lighting fixtures.

See **Figure 3** for illustration.

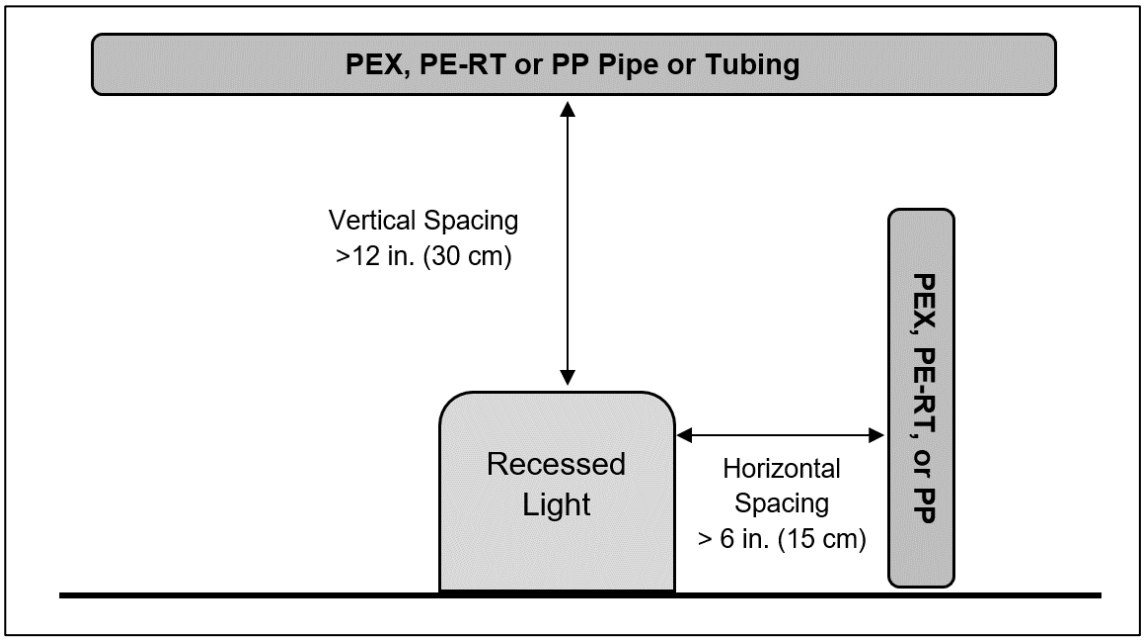

Figure 3: Protecting PEX, PE-RT or PP pipe or tubing against excessive air temperature with default minimum spacing

Note 2: The recommendations of Section 3.3 do not apply to CPVC pipe or tubing.

4.0 SUMMARY

For both long-term safety of the plastic pipes listed in this document and for safety of the building occupants, it is the responsibility of the pipe installer to maintain a safe minimum distance between pipes and recessed light fixtures so that the recommended pipe surface temperature limitation of 180°F (82°C) is not exceeded.

For additional instructions, please contact the specific pipe or tubing manufacturer.