

Proposed Change 2112

Code Reference(s):	NFC25 Div.B 4.5.2.1.(3) (first printing)
Subject:	Piping and Transfer Systems
Title:	Introduction of a New Standard for Aboveground Piping Systems
Description:	This proposed change adds a reference to ANSI/CAN/UL/ULC 1369:2020, "Standard for Aboveground Piping for Flammable and Combustible Liquids," to ensure conformance of metallic and non-metallic piping systems used in aboveground installations.
Related Code Change Request(s):	CCR 1541

This change could potentially affect the following topic areas:

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| ☐ Division A | ☒ Division B |
| ☐ Division C | ☒ Design and Construction |
| ☒ Building operations | ☐ Housing |
| ☐ Small Buildings | ☒ Large Buildings |
| ☒ Fire Protection | ☒ Occupant safety in use |
| ☐ Accessibility | ☐ Structural Requirements |
| ☐ Building Envelope | ☐ Energy Efficiency |
| ☐ Heating, Ventilating and Air Conditioning | ☐ Plumbing |
| | ☐ Construction and Demolition Sites |

Problem

Materials for piping systems, including piping, valves and fittings used for flammable or combustible liquids, must be suitable for the maximum anticipated working pressures, operating temperatures, and chemical properties of the contained liquid. These requirements are outlined in Article 4.5.2.1. of the National Fire Code of Canada (NFC).

The NFC allows the use of non-metallic, combustible piping systems in underground installations only, in accordance with CAN/ULC-S679, "Standard for Metallic and Nonmetallic Underground Piping for Flammable and Combustible Liquids," as specified in Sentence 4.5.2.1.(3). However, non-metallic piping systems are not permitted for aboveground installations because Clause 4.5.2.1.(2)(b) limits the use of non-metallic materials, except as allowed by Sentence 4.5.2.1.(3).

Typical piping systems designed to convey flammable or combustible liquids for aboveground applications consist of a metallic inner pipe that serves as the primary carrier pipe with a non-metallic outer jacket that provides protection from external exposure. Regardless of the material properties (metallic, non-metallic or composite), all aboveground piping systems must meet the requirements set out in ANSI/CAN/UL/ULC 1369, "Standard for Aboveground Piping for Flammable and Combustible Liquids," which governs their installation.

Restricting the use of non-metallic piping materials for aboveground installations may unintentionally limit the use of non-metallic piping systems that have demonstrated compliance with the performance requirements of ANSI/CAN/UL/ULC 1369 for aboveground applications, so this proposed change introduces this standard in Article 4.5.2.1.

Justification

While NFPA 30, "Flammable and Combustible Liquids Code," establishes safety objectives for aboveground piping systems conveying flammable and combustible liquids, ANSI/CAN/UL/ULC 1369, "Standard for Aboveground Piping for Flammable and Combustible Liquids," provides the detailed performance and fire-test criteria necessary to demonstrate compliance with those objectives. ANSI/CAN/UL/ULC 1369, "Standard for Aboveground Piping for Flammable and Combustible Liquids," is a bi-national standard first published in 2018. NFPA 30 is the authoritative standard for safe storage, handling and use of flammable and combustible liquids. This standard is referenced within the NFC as a guide for good engineering practice, both in the body of the Code and in the explanatory Notes. NFPA 30 is also cited in ANSI/CAN/UL/ULC 1369.

ANSI/CAN/UL/ULC 1369 provides the minimum requirements for primary, secondary and coaxial types of aboveground piping used for the transfer and containment of specific flammable and combustible liquids, fuels, fuel components, and associated vapours. These include piping systems used in manufacturing, processing and distribution facilities; commercial or fleet motor vehicle fueling stations; and similar fuel-dispensing applications; as well as for fueling generators, burners or similar equipment.

The piping materials that conform with this standard may be flexible or rigid and constructed from metallic, non-metallic or composite materials. The pipes are available in single-continuous or multiple-joined lengths with integral end fittings and they range in pipe sizes from 12.7 mm to 152.4 mm (from 0.5 in. to 6.0 in.). They are generally intended for aboveground use, either directly on or suspended above the ground, and can also be used for special aboveground applications that require additional evaluation for a specific purpose.

Allowing non-metallic piping materials for aboveground installations, provided these materials meet performance requirements intended to achieve an equivalent level of safety and performance to those specified for metallic materials in ANSI/CAN/UL/ULC 1369, would not diminish overall safety or system performance. This proposed change

would enhance flexibility for Code users by allowing piping materials to be selected based on installation conditions, without compromising health or safety. The inclusion of additional options for piping materials would provide a broader range of choices for Code users, encourage innovation, and maintain the integrity of the intended piping system.

PROPOSED CHANGE

[4.5.2.1.] 4.5.2.1. Materials

- [1] 3)** Metallic and non-metallic piping systems are permitted to be used ~~for~~ in
- [a] --) underground ~~installations~~ piping systems, provided they conform to CAN/ULC-S679, "Standard for Metallic and Nonmetallic Underground Piping for Flammable and Combustible Liquids", and
 - [b] --) aboveground piping systems, provided they conform to ANSI/CAN/UL/ULC 1369, "Standard for Aboveground Piping for Flammable and Combustible Liquids."

Impact analysis

This proposed change would not alter the requirements for underground piping systems for flammable or combustible liquids; in fact, it expands the options, by permitting non-metallic piping materials for aboveground systems. Since the Code would still provide the option to use the piping materials already referenced, such as metallic piping, no additional costs are expected as a result of this proposed change.

Potential cost savings might arise from expanding the range of acceptable piping materials, including non-metallic options, which could provide greater flexibility and potentially lower costs for aboveground installations. Savings might be realized through lower material costs, reduced labour (due to lighter weight and simplified installation methods), and a decreased need for corrosion protection measures. Broadening the range of acceptable materials might also enhance design flexibility.

The proposed change is not expected to negatively affect other Code objectives, provided that the piping materials comply with the referenced standards and applicable manufacturer's instructions, and are installed in accordance with the Code. All existing Code objectives would continue to apply to piping materials that meet the referenced standards, such as objectives related to reducing the likelihood of fire occurrence or spread, limiting risk to occupants, protecting property, and minimizing health impacts associated with fire events. These referenced standards specify the intended limits to application for both metallic or non-metallic piping systems, thereby maintaining the required level of protection intended by the Code objectives, while ensuring the intended level of performance.

Enforcement implications

This proposed change could be enforced without additional resources. Authorities having jurisdiction would continue to verify compliance of the piping materials, whether metallic or non-metallic, with the applicable referenced standards for aboveground applications.

Who is affected

This proposed change might affect a wide range of stakeholders involved in the design, specification, manufacture, approval, construction or operation of facilities for the storage of combustible products and dangerous goods; including, but not limited to, designers, specifiers, manufacturers, building owners, contractors and building officials.

OBJECTIVE-BASED ANALYSIS OF NEW OR CHANGED PROVISIONS

[\[4.5.2.1.\]](#) 4.5.2.1. ([\[1\]](#) 3) [F20,F80-OS1.1]

[\[4.5.2.1.\]](#) 4.5.2.1. ([\[1\]](#) 3) [F20,F80-OP1.1]

[\[4.5.2.1.\]](#) 4.5.2.1. ([\[1\]](#) 3) [F20,F80-OH5]