ATIS-0600031.02

Distributed Single Phase Cooling – Standardized Infrastructure

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ATIS-0600031.02, *Distributed Single Phase Cooling – Standardized Infrastructure*
Is an American National Standard developed by the **Network Physical Protection (NPP)** Subcommittee under the **ATIS Sustainability in Telecom: Energy and Protection Committee (STEP)**.

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American National Standard for Telecommunications

Distributed Single Phase Cooling – Standardized Infrastructure

Alliance for Telecommunications Industry Solutions

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American National Standards Institute, Inc.

Abstract

Equipment cooling infrastructure solutions have expanded and adapted to meet increasing equipment heat loads and improved energy efficiencies. Infrastructure solutions now include energy efficient Close-coupled cooling (C^3) alternatives that bring the cooling (heat transfer) closer to the heat source. One C^3 solution utilizes a single phase media, typically water, as a thermal transfer medium. As the industry adopts and integrates Distributed Single Phase Cooling (DSPC) systems, common infrastructure standards are needed to ensure interoperability and connectivity between manufacturers. This standard outlines design requirements for a standard single phase media distribution infrastructure.

Foreword

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

As a leading technology and solutions development organization, the Alliance for Telecommunications Industry Solutions (ATIS) brings together the top global information and communications technology (ICT) companies to advance the industry's most-pressing business priorities. ATIS serves the public through improved understanding between carriers, customers, and manufacturers. The Sustainability in Telecom: Energy and Protection (STEP) Committee – formerly the Network Interface, Power, and Protection Committee (NIPP) – engages industry expertise to develop standards and technical reports for telecommunications equipment and environments in the areas of energy efficiency, environmental impacts, power and protection. The work products of STEP enable vendors, operators and their customers to deploy and operate reliable, environmentally sustainable, energy efficient communications technologies. STEP is committed to proactive engagement with national, regional and international standards development organizations and forums that share its scope of work.

ANSI guidelines specify two categories of requirements: mandatory and recommendation. The mandatory requirements are designated by the word *shall* and recommendations by the word *should*. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages.

Suggestions for improvement of this standard are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, STEP, 1200 G Street NW, Suite 500, Washington, DC 20005.

At the time of consensus on this standard, STEP, which was responsible for its development, had the following roster:

J. Jackson, STEP Chair (Southwire)
E. Gallo, STEP Vice Chair (Ericsson)
C. Von Hagel, STEP-NPP Chair (Intertek)
M. Levitre, STEP-NPP Vice Chair (Southwire)

The Network Physical Protection (NPP) Subcommittee was responsible for the development of this standard.

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1 Scope, Purpose, & Application

1.1 Scope

This standard is part of a suite of standards supporting the installation design and material selection of distributed cooling systems for electronic equipment. More specifically, this standard addresses material and connectivity specifications for the deployment of a universal distributed single phase media infrastructure. DRC systems are typically comprised of three (3) primary common elements: 1) Thermal transfer system – Single phase media pumping unit; 2) single phase media distribution infrastructure; and 3) close-coupled cooling units.

Unless otherwise specifically identified, this standard supports single phase media systems incorporating water with or without glycol additives as the single phase media utilized in the distribution infrastructures between the pumping unit and close-coupled cooling units.

1.2 Purpose

The purpose of this standard is to provide support for the deployment of a universal application infrastructure for Distributed Single Phase Cooling (DSPC) systems. The universal application allows for the installation of a single, common infrastructure that is adaptable to support multiple vendors of DSPC. This infrastructure may be designed and installed within an equipment area prior to the placement of equipment and racking, without specificity of the DSPC vendor. This early placement may reduce overall installation costs and provides for more rapid deployment equipment build-outs in the supported space. The standard also provides for a designation of standard-single phase media infrastructure interface(s) or port(s). This commonality provides manufacturers of equipment-specific standards and specifications for connectivity to the core single phase media infrastructure. For the purposes of this standard, the primary cooling loop (e.g., chilled water, DX, etc.) is not included.

2 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

[Ref 1] ASME B 31, *Power Piping.*[1]

[Ref 2] ASTM B 88-09, *Standard Specification for Seamless Copper Water Tube.*[2]

[Ref 3] ASTM B 280-08, *Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.*[2]

[Ref 3] ASTM D 2863, *Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index).*[2]

[Ref 4] ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials.*[2]

[1] This document is available from ASME < https://www.asme.org/>.

[2] This document is available from the American Society for Testing and Materials (ASTM) < http://www.astm.org