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Pneumatic quick-action couplings – Plug dimensions

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Foreword

This Foreword is not part of NFPA Recommended Standard *Pneumatic Quick-action couplings – Plug dimensions*, NFPA/T3.20.14-1989 (R2004).

A military standard, MIL-C-4109, covering pneumatic quick-action couplings has been in existence since about the time of World War II. It includes the dimensions for two sizes of couplings, one intended for use with 1/4 inch i.d. hose and the other for 1/2 inch. A number of US quick-action coupling manufacturers produce couplings that accept plugs conforming to MIL-C-4109 and have added two additional sizes (3/8 and 3/4) that are not covered by the standard. This series of pneumatic quick-action couplings is commonly called “Interchange Design” or the “Industrial Interchange Design” because coupling halves from different manufactures would interchange with each other.

In the mid 1970's ISO/TC 131/SC 4/WG 5, Pneumatic quick-action couplings, was formed and began work on an ISO pneumatic coupling standard. That proposed standard evolved into a proposed standard covering pneumatic quick-action couplings for three different pressure ratings, Series A, 10 bar (145 psi), Series B, 16 bar (232 psi) and Series C, 25 bar (363 psi). The proposed ISO standard also includes performance and testing requirements and procedures. The Series B being considered at ISO was similar to the US “Industrial Interchange” design. One major area of difference was that the ISO document specified an inside diameter “as large as possible” while MIL-C-4109 specifically dimensioned the inside diameter. Despite a number of unfavorable comments to the “as large as possible” specification, it remains in the ISO document.

At its 15 March 1983 meeting, the Quick-Action Couplings Section, T3.20, determined that a published US standard covering the “Interchange” design was needed in order for the US to have a published standard to advocate at the ISO level. MIL-C-4109 was not adequate since it only covered two of the four popular sizes.

On 7 February 1985 a TSP was submitted to the NFPA Technical Board and was approved. This project was assigned the number T3.20.14.

Draft number one was submitted to T3.20 at their 18 March 1986 meeting.

At the 30 September 1986 meeting of T3.20, Draft No. 1 was reviewed and granted approval to submit for General Review. NFPA Technical Staff prepared the General Review Draft on 30 October 1987.

Two comments were received on the General Review Draft and were discussed at the 15 March 1988 T3.20 Section meeting. Replies were mailed to the commentators on 25 March 1988.

One comment remained unresolved when T3.20 met on 9 June 1988. The Section voted to change dimension “H” on the 10 size from 26.187 to 26.975 to resolve the comment and further to submit T3.20.14 to the Technical Board for their approval to ballot if the comment was resolved. The comment reply was mailed on 12 July 1988. The remaining comment was resolved on 18 July 1988. The document was submitted to the Technical Board on 15 September 1988 and granted approval to ballot.

NFPA's Technical Staff prepared the document for Ballot on 23 September 1988. The Ballot closed with unanimous approval.

On 14 February 1989 the Section voted to submit the document to the NFPA Technical Board for final approval.

On 16 March 1989, the NFPA Technical Board voted unanimously to approve the document as an NFPA Recommended Standard.

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Introduction

In pneumatic fluid power systems, power is transmitted and controlled through a gas under pressure within an enclosed circuit. Quick-action couplings are used to quickly join or separate fluid lines without the use of tools or special devices.

Pneumatic quick-action couplings — Plug dimensions

1 Scope and field of application

To include:

1.1 Pneumatic quick-action coupling plugs of the design commonly referred to in the United States as the “Industrial Interchange Design;”

1.2 The Class A (1/4 inch) and Class C (1/2 inch) plugs described in MIL-C-4109;

1.3 Plugs with a maximum working pressure of 16 bar (232 psi).

To define:

1.4 Plug dimensions only and to exclude materials of construction and performance requirements other than rated pressure.

To promote:

1.5 The understanding and use of quick-action couplings;

1.6 Accurate communication.

1.7 This document will provide a dimensional standard covering a complete range of sizes of pneumatic quick-action couplings produced by a large number of US and non-US manufacturers.

1.8 This Standard only applies to the dimensional criteria of products manufactured in conformance with this standard. It does not apply to their functional characteristics.

2 References

ISO 6150, *Pneumatic fluid power – Cylindrical quick-action couplings for maximum working pressures of 10 bar, 16 bar and 25 bar (1 MPa, 1,6 MPa and 2,5 MPa) – Plug connecting dimensions, specifications, application guidelines and testing.*

ANSI/B93.2, *Fluid power systems and products – Glossary*.

ISO 1000, *SI units and recommendations for the use of their multiples and of certain other units*.

MIL-C-4109E, *Military Specification, Coupling Halves, Low Pressure, Air Hose, Quick Disconnect*.

NFPA/T2.10.1M, *Metric Units for Fluid Power Applications*.

NFPA/T3.20.1 R1, *Fluid power systems – Quick-action couplings – Glossary*.