



ANSI/(NFPA) T2.25.1 R2-2005

Third edition

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Pneumatic fluid power – Systems standard for industrial machinery – Supplement to ISO 4414:1998 – Pneumatic fluid power – General rules relating to systems

Must be used in conjunction with ISO 4414:1998

A NATIONAL INDUSTRY STANDARD FOR FLUID POWER

**Approved by Committee ASC B93,
accredited by the American National Standards Institute (ANSI)**



Descriptors: pneumatic fluid power systems standard industrial machinery supplement ISO 4414 general rules systems

Developed and published by

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Suggestions for improvement gained in the use of this standard will be welcome. They should be sent to the National Fluid Power Association, 3333 North Mayfair Road, Milwaukee, WI 53222-3219.

Any part of this standard may be quoted. Credit lines should read: Extracted from the national industry standard *Pneumatic fluid power – Systems standard for industrial machinery – Supplement to ISO 4414:1998 – Pneumatic fluid power – General rules relating to systems*, ANSI/(NFPA)T2.25.1 R2-2005.

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Foreword

This forward is not part of the National Fluid Power Association (NFPA) Recommended Standard *Pneumatic fluid power — Systems standard for industrial machinery — Supplement to ISO 4414:1998 — Pneumatic fluid power — General rules relating to systems*, ANSI/(NFPA)T2.25.1 R2-2005.

In 1975, the Joint Industrial Conference developed JIC Pneumatic Standard P-1-1975. When the Joint Industrial Conference became inactive, the Board of Directors of both the JIC and the NFPA reached an agreement in 1981 that the JIC document would be updated and issued as an NFPA standard (NFPA/T2.25.1). This was accomplished in 1986, and the standard was advanced to ANSI status (ANSI/B93.114M) in 1987.

In the meantime, ISO 4414 had been issued in 1982, with much of the content similar to the original JIC standard. In 1992, an effort was begun to update ISO 4414 and to coordinate its content organization with that of the hydraulic system standard, ISO 4413. This was concluded in 1998 when the second edition of ISO 4414 was issued.

The recent policy of NFPA is to give priority to ISO standards development, and to develop NFPA/ANSI standards only where a national requirement is not satisfied by an ISO standard. In the case of pneumatic systems, the second edition of ISO 4414 includes many of the USA national requirements. However, some of the units of measure are different than those in the USA, and a few provisions common to the USA are not included in the ISO standard. Therefore, NFPA/T2.25.1 R2 was created as an extension of the ISO 4414 standard to cover common USA practices.

The NFPA Technical Board approved the TSP at its 18 November 1999 meeting.

Draft no. 1 was circulated on 10 May 2000 and was discussed at an NFPA/T2.25.1 R1 project group meeting held on 17 May 2000. Draft no. 2 was circulated on 25 August 2000; comments received from the review were discussed at NFPA/T2.25.1 R2 project group meetings on 20 September 2000 and 7 February 2001. Draft no. 3B was also discussed at the 7 February 2001 NFPA/T2.25.1 R2 project group meeting. Draft no. 5 was circulated on 1 February 2001 and was discussed at NFPA/T2.25.1 R2 project group meetings on 17 May 2001 and 19 September 2001. Draft no. 6 was circulated on 21 June 2001 and discussed during an NFPA/T2.25.1 R2 project group teleconference meeting on 28 June 2001. The NFPA/T2.25.1 R2 project group approved a motion that an updated draft be circulated for general review.

On 8 January 2002, Mr. Allen withdrew as Project Chair, and Mr. Berninger accepted this new position. On 16 January 2002, the general review draft was circulated.

On 6 February 2002, the project group reviewed the comments received from the general review ballot and made changes to the document. The group agreed to review draft no. 7 at the next project group meeting, which was scheduled for 15 May 2002.

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The 15 May 2002 project group meeting was cancelled due to meeting time constraints. At its 18 September 2002 meeting, the NFPA/T2.25.1 R2 project group agreed to the circulation of the second general review ballot.

The second general review ballot was circulated on 5 November 2002 and closed on 5 December 2002. On 12 December 2002, the NFPA/T2.25.1 R2 project group met via teleconference, discussed the comments received and made changes to the document. The group agreed to recommend the circulation of a final ballot, pending approval of the NFPA Technical Board.

At its 7 January 2003 meeting, the NFPA Technical Board agreed to approve the recommendation for final ballot. The final ballot was circulated on 27 January 2003 and closed on 27 February 2003. The comments from the final ballot were resolved via correspondence and at the 14 May 2003 joint meeting of NFPA/3.21 and U.S. TAG SC 5/Pneumatic. At that meeting, NFPA/T3.21 approved a motion to recommend to the NFPA Technical Board that NFPA/T2.25.1 R2-200x, updated in accordance with the disposition of comments on the final ballot draft, be published, pending the final report from NFPA headquarters and the technical auditor's approval. The technical auditor, Mr. Wanke, gave his approval on 25 June 2003, and the NFPA Technical Board approved the document publication at its 26 June 2003 meeting.

Project group members who developed this standard:

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On 22 March 2004, NFPA/T2.25.1 R2-2003 was submitted to Accredited Standards Committee B93 for publication ballot, for adoption as an American National Standard. Balloting closed on 3 May 2004, but the document did not receive a sufficient number of ballots.

On 3 August 2004, a follow-up ballot on the document was submitted to ASC B93 committee members who had not responded to the original ballot and closed as soon as the two needed votes were received (by 10 August 2004).

ANSI's Board of Standards Review approved ANSI/(NFPA)T2.25.1 R2-2005 for publication on 18 February 2005. Users of this standard should note that Annex E of this document has been altered from NFPA/T2.25.1 R2-2003, to update document source contact information.

The membership roster of Accredited Standards Committee B93 at the time of ballot:

Jack C. McPherson
Chairman

Material Handling Institute
Jack C. McPherson

Jenna Wetzel
Secretary and Staff Liaison

Milwaukee School of Engineering
Thomas S. Wanke

American Society of Agricultural Engineers
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Compressed Air & Gas Institute
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Fluid Power Society
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Introduction

In pneumatic fluid power systems, power is controlled through a gas under pressure within a circuit. When several pneumatic components are joined together in one system, it is imperative that they be correctly applied in order to derive the maximum benefits from an efficient pneumatic system.

Users and suppliers of industrial equipment, along with component manufacturers, have long recognized that personnel safety and uninterrupted production are essential to the economic growth of the fluid power industry. The application of pneumatics to industrial equipment resulted in the preparation of the first pneumatic system standard in the 1950s by the Joint Industrial Council (JIC).

Pneumatic fluid power — Systems standard for industrial machinery — Supplement to ISO 4414:1998 — Pneumatic fluid power — General rules relating to systems

1 Scope

This standard provides general rules relating to pneumatic systems used in industrial manufacturing processes. It is intended as a guide for both suppliers and purchasers, with a view to ensuring:

- a) safety;
- b) uninterrupted system operation;
- c) ease and economy of maintenance;
- d) long life of the system.

This standard does not apply to air compressors and the systems associated with air distribution, as typically installed in a factory.

This standard is based upon the provisions of ISO 4414:1998, with certain exceptions as described herein. The user will require both of these standards for use on a pneumatic systems application in the USA.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this NFPA document. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this NFPA document are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referenced applies. NFPA maintains registers of currently valid NFPA and ANSI/(NFPA) Standards. Standards development organization contact information and links can be found on the NFPA website (www.nfpa.com).

ANSI Z244.1 (*latest edition*), *Safety Requirements for the Lock Out/Tag Out of Energy Sources*.

IEC 60529 (*latest edition*), *Degrees of Protection Provided by Enclosures (IP Code)*.

IEC 61010-2-041 (*latest edition*), *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-041: Particular requirements for autoclaves using steam for the treatment of medical materials, and for laboratory processes*.

IEEE/ASTM SI 10 (*latest edition*), *Standard for Use of the International System of Units (SI): The Modern Metric System*.

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

ISO 4414:1998, *Pneumatic fluid power – General rules relating to systems*.