



**ANSI/(NFPA)T2.12.5 R1-2005**

Second edition

21 December 2005

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## Information report – Fluid power – Laboratory guidelines

# **A NATIONAL INDUSTRY STANDARD FOR FLUID POWER**

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



Descriptors: fluid power laboratory industrial equipment instrument reference instrument inspection machining heat treatment analysis chemical metallurgical stress fatigue control testing instrumentation

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Developed and published by

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Published by  
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Printed in USA

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## Foreword

This foreword is not part of American National Standard *Information report – Fluid power – Laboratory guidelines*, ANSI/(NFPA)T2.12.5-2005, (revision of ANSI/B93.74-1987 [NFPA/T2.12.5-1983]).

At the 21 May 1996 NFPA/T2.12 Testing Committee meeting, Mr. Wanke's comments, based on his review of the guidelines, were discussed, and a motion was made to revise ANSI/B93.74-1987.

At the 17 September 1996 NFPA/T2.12 Testing Committee meeting, copies of the Title, Scope and Purpose (TSP) were distributed for discussion. Mr. Biederman volunteered to act as NFPA/T2.12.5 R1 Project Chair. Mr. Wanke agreed to act as a project group member and explore Mr. Wilcox's interest in joining the project group.

At the 11 February 1997 NFPA/T2.12 Testing Committee meeting, TSP revisions were discussed. Project Chair Biederman agreed to forward the revised TSP to Headquarters for distribution with the meeting minutes. A letter ballot was circulated for approval of a recommendation to the Technical Board to approve the TSP. Mr. Wanke agreed to supply copies of relevant ANSI standards and Milwaukee School of Engineering (MSOE) lab guidelines to the Project Chair. An annex listing related safety, lab procedures, lab guidelines, and lab certification standards would be included in NFPA/T2.12.5 R1-200x.

On 10 April 1997, Technical Board members approved the TSP. Mr. Selke agreed to serve as Technical Auditor.

At the 10 February 1998 NFPA/T2.12 Testing Committee meeting, Mr. Biederman distributed draft no. 3 for review.

At the 19 May 1998 NFPA/T2.12 Testing Committee meeting, draft no. 4 was circulated for review.

At the 29 September 1998 NFPA/T2.12 Testing Committee meeting, comments received from draft no. 4 were briefly reviewed, and further discussion was tabled until the next meeting.

At the 9 February 1999 project group meeting, draft no. 5 was reviewed, and Mr. Biederman agreed to make changes to the document using past comments received.

At the 18 May 1999 project group meeting, draft no. 6, dated 17 May 1999, was reviewed and changes were made to the document.

At the 21 September 1999 project group meeting, draft no. 6 was reviewed again, and members continued discussing the comments received from the NFPA/T2.12 18 May 1998 meeting.

At the 8 February 2000 project group meeting, members reviewed the comments from the draft ballot circulated 4 November 1999 and made changes to the document.

At the 16 May 2000 project group meeting, members reviewed draft no. 7, beginning with clause 8.

At the 18 September 2000 project group meeting, members reviewed draft no. 8.

At the 6 February 2001 project group meeting, members reviewed draft no. 9.

During a 23 April 2001 conference call meeting, project group members reviewed draft no. 11 and made changes.

At the 16 May 2001 project group meeting, members reviewed draft no. 12 and made changes to the document. The group approved a motion for NFPA/T2.12.5 R1-200x to be circulated for general review.

At the 18 September 2001 project group meeting, members reviewed draft no. 13, which included input from text content assigned at the May 2001 meeting, and made changes to the document. NFPA Headquarters made changes to the document and circulated an updated draft to Mr. Bolinger, Mr. Wanke and Mr. Biederman before circulating the general review ballot.

At the 5 February 2002 project group meeting, members reviewed the comments received from the general review ballot, which was circulated on 8 November 2001 and closed on 12 December 2001, and made changes to the document. Headquarters was to schedule a conference call to further discuss the comments from the first general review and circulate the document for second general review ballot.

At the 14 May 2002 project group meeting, members reviewed draft no. 14 and made changes to the document. The group approved a motion for NFPA/T2.12.5 R1-200x to be circulated for a second general review.

At the 17 September 2002 project group meeting, members reviewed the comments received from the second general review ballot, which was circulated on 6 May 2002 and closed on 6 June 2002, and made changes to the document.

At the 6 February 2003 project group meeting, Mr. Pusateri agreed to complete draft no. 1 of Annex A (data to include in a laboratory report) for discussion at a teleconference in April 2003. Depending on the comments received at that time, the revised project was to either be circulated for third general review with the addition of Annex A, or NFPA/T2.12.5 R1-200x would be circulated for final ballot and Annex A would be included in the R2 revision of the document. The group also reviewed and approved the TSP draft for the R2 revision of the document.

At the 17 April 2003 project group meeting, members decided to remove Annex A from the document and place reporting requirements as a new clause 9, Recommended data for laboratory reports. Because of this significant change, NFPA/T2.12.5 R1-200x was circulated for third general review on 17 April 2003, with the ballot closing 17 May 2003. All recommendations for the R2 version were included in this third general review.

At the 15 May 2003 project group meeting, members reviewed the comments received from the third general review and made editorial changes. They also recommended deactivation of the R2 version of the document. At the joint meeting of NFPA/T2.12 and U.S. TAG SC 8, members approved a recommendation for final ballot, if no further comments were received, and deactivation for the R2 version of the document.

At the 26 June 2003 Technical Board meeting, Board members approved NFPA/T2.12's recommendations to submit NFPA/T2.12.5 R1-200x for final ballot and to deactivate NFPA/T2.12.5 R2-200x.

Headquarters circulated NFPA/T2.12.5 R1-200x for final ballot on 25 September 2003, with a closing date of 25 October 2003.

At the 19 February 2004 joint meeting of NFPA/T2.12 and U.S. TAG SC 8, members reviewed the comments received from the final ballot. Members approved a motion to publish the document as an NFPA standard, pending the inclusion of Barbara Biederman's editorial changes and a Technical Auditor report, then submit the NFPA document to ANSI for adoption as an American National Standard.

At the 1 April 2004 Technical Board meeting, Board members approved NFPA/T2.12's recommendation to publish NFPA/T2.12.5 R1-200x, and submit it to ANSI for adoption.

Project group members who developed this standard are:

**Fred Biederman**  
Project Chair  
Hydraforce, Inc.

**Tom Wanke**  
Section Chair  
Milwaukee School of Engineering

**John Montague\***  
Section Vice-Chair  
Bosch Automation Technology

**Dave Prevallet**  
Technical Auditor  
Prevallet Technical Services

**June VanPinsker\***  
Technical Coordinator  
National Fluid Power Association

**Jenna Wetzel\***  
Standards Development Coordinator  
National Fluid Power Association

**Brad Bohlmann**  
Eaton Corp.

**John G. Eleftherakis**  
Fluid Technologies, Inc.

**Jack L. Johnson**  
IDAS Engineering Inc.

**Steve Wagner**  
Donaldson Co., Inc.

**Wayne Wilcox**  
Consultant

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\*No longer with company.

/jw

On 28 June 2004, NFPA/T2.12.5 R1-2004 was submitted to ANSI Committee B93 for ballot. Balloting closed with one negative vote and comments.

At the 23 September 2004 joint meeting of NFPA/T2.12 and U.S. TAG SC 8, the group reviewed and resolved Mr. Wilcox's comments from his negative vote. Consequently, the accepted comments resulted in several changes to the normative portion of the document.

On 28 January 2005, a new BSR-8 form was submitted to ANSI, with an outline of the document changes, and the revised document was submitted to ANSI committee B93 for rebalot.

ANSI/(NFPA)T2.12.5 R1-2005 was approved by ANSI's Board of Standards Review on 21 December 2005.

The membership roster of Standards Committee B93 at the time of both ballots:

**Jack C. McPherson**  
Chairman

**To be determined**  
Vice Chairman

**Karen Boehme**  
Secretary and Staff Liaison

**American Society of Agricultural  
Engineers**  
Scott Cedarquist

**Compressed Air & Gas Institute**  
John Addington

**Eaton Corporation**  
Jerry Carlin

**Fluid Power Society**  
Clayton W. Fryer

**Fluid Sealing Association**  
Robert Ecker

**General Motors**  
R. Joe Nunley

**Material Handling Institute**  
Jack C. McPherson

**Milwaukee School of Engineering**  
Thomas S. Wanke

**Motion Industries**  
Larry Kuziak

**National Fluid Power Association**  
John F. Berninger

**Individual Members**  
John Montague  
Albert Roberts  
Paul Schacht  
John F. Walrad  
James C. White  
Wayne K. Wilcox

/jw

## **Introduction**

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit. These systems use various fluid power components that transmit power through a variety of conductors and associated components.

A fluid power laboratory is a place fitted with an apparatus for conducting engineering investigations of fluid power components, systems and fluids.

These engineering investigations may include analysis, development and performance evaluations.

To conduct these engineering investigations, various supporting processes such as assembly, inspection, machining, welding, heat treatment, chemical analysis, metallurgical analysis, stress and fatigue analysis, testing and instrumentation control may be utilized.

# Information report – Fluid power – Laboratory guidelines

## 1 Scope

1.1 This information report includes the following items:

- a) an accumulation of various practices and procedures for fluid power testing laboratories;
- b) references to or excerpts from published technical literature, applicable to fluid power testing laboratories;
- c) a subject index.

1.2 This information report is not intended to be a comprehensive guide to designing and operating a laboratory, but is a document with any or all portions optional to the user. Applicable local, state and federal codes and guidelines may supersede the information within this report.

## 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](http://www.nfpa.com)).

NOTE Standards with an asterisk (\*) are developed by the National Fire Protection Association.

### 2.1 General

ANSI A1264.1 (*latest edition*), *Safety Requirements for Workplace Floor and Wall Openings, Stairs and Railing Systems*.

ANSI Z41 (*latest edition*), *Personal protection protective footwear*.

ANSI Z87.1 (*latest edition*), *Practice for occupation and education – Eye and face protection*.

ASME Section VIII, Division 1 (*latest edition*), *Code for unfired pressure vessels*.

29 CFR 1910 (*latest edition*), *Code of Federal Regulations – Labor – Occupational Safety and Health*.

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 1219-1 (*latest edition*), *Fluid power systems and components – Graphic symbols and circuit diagrams – Part 1: Graphic symbols*.