



NFPA Recommended Standard
NFPA/T3.21.3 R1-2008 (R2013)
3 September 2008

AN INDUSTRY STANDARD FOR FLUID POWER

**Pneumatic fluid power —
Flow rating test procedure and reporting method —
For fixed orifice components**

[revision of ANSI/(NFPA)T3.21.3-1990]

This method is to be used as an alternative to ISO 6358, which is recognized as the preferred flow rating test procedure and reporting method.

Descriptors: flow rating, fixed orifice; flow rating, pneumatic; fluid power; pressure drop; reporting method; test method

published by

NATIONAL FLUID POWER ASSOCIATION, INC.

3333 N. Mayfair Road / Milwaukee, WI 53222-3219 USA

PHONE: +1 414 778 3344 / FAX: +1 414 778 3361 / E-mail: nfpa@nfpa.com

Copyright 2008 by the
NATIONAL FLUID POWER ASSOCIATION
Printed in the USA

All standards, recommended practices, information reports, and bibliographies (collectively, "NFPA Documents") are advisory only. Use thereof by anyone for any purpose is entirely voluntary and in any event without risk of any nature to the National Fluid Power Association (NFPA), its officers, directors or authors of such work. There is no agreement by or between anyone to adhere to any NFPA Document. In formulating and approving NFPA Documents, NFPA and/or its councils and committees will not investigate or consider citations, references or patents which may or may not apply to such subject matter since prospective users of such NFPA Documents alone are responsible for establishing necessary safeguards in connection with utilization of such matters, including technical data, proprietary rights or patentable materials.

The information and data contained in NFPA Documents has been obtained from sources believed to be reliable. However, it should not be assumed that all acceptable or applicable sources of information, procedures, methods or techniques are contained in NFPA Documents, or that additional measures may not be required under certain circumstances or conditions.

NFPA Documents and/or policies and procedures are subject to periodic review and may be changed without notice. NFPA Documents are only current as of their publication date. NFPA Documents, after publication, may be revised or withdrawn at any time and current information on all NFPA Documents may be received by calling or writing NFPA. Additionally, the various codes and regulations referenced in NFPA Documents may be amended from time to time and it should not be assumed that the versions referenced therein are the most current versions of such codes and regulations. Please consult the appropriate regulatory authorities for the most up-to-date versions.

NFPA Documents imply a consensus of those substantially concerned with their scope and provisions and are intended as a guide to aid the manufacturer, the consumer and the general public. The publication of NFPA Documents does not in any respect preclude anyone, whether they have participated in the development of or approved such NFPA Documents or not, from manufacturing, marketing, purchasing, or using of products, processes or procedures not conforming to the NFPA Documents. NFPA Documents do not constitute or indicate a warranty of any sort, express or implied, including but not limited to a warranty or representation as to quality, merchantability or fitness for a particular use or purpose.

Participation by federal agency representative(s) or person(s) affiliated with the industry is not to be interpreted as government or industry endorsement of an NFPA Document(s).

NOTICE

NFPA Documents do not express or imply any judgment, certification or endorsement of or with respect to, the safety, design or performance of any product, component, or its use.

NFPA does not examine, investigate, test, recommend, or certify the design, use or safety of any product or component, even those which may incorporate one or more NFPA Documents. NFPA Documents therefore have no application to and do not express or imply any recommendation, representation or warranty, with respect to the safety, design, use, performance, or functional interchangeability of components or products which incorporate NFPA Documents.

This publication may not, in whole or in part, be reproduced, copied or disseminated, entered into or stored in a computer database or retrieval system, or otherwise utilized without the prior written permission of NFPA.

Foreword

This Foreword is not part of NFPA Recommended Standard *Pneumatic fluid power - Flow rating test procedure and reporting method - For fixed orifice components*, NFPA/T3.21.3 R1-2008.

At its 18 February 2004 meeting, NFPA/T3.21 recommended that NFPA/T3.21.3-1990 be revised to take into account the comments from NFPA/T3.21's five-year review of the standard.

At its 1 April 2004 meeting, the NFPA Technical Board approved the Title, Scope and Purpose for NFPA/T3.21.3 R1-200x.

On 17 May 2005, draft no. 1 was circulated to NFPA/T3.21 for discussion at its 8 June 2005 meeting. At the 8 June 2005 meeting, a motion was made to circulate the document for general review. It was circulated for general review on 3 March 2006. The voting resulted in five approval votes, with no disapprovals or comments.

At the 17 May 2006 joint meeting of NFPA/T3.21 and U.S. TAG to ISO/TC 131/SC 5/Pneumatic, a motion was approved to ask the NFPA Technical Board for permission to circulate the document for final ballot. The NFPA Technical Board gave such approval on 10 August 2006.

The document was circulated for final ballot on 7 August 2007 and closed on 21 September 2007. The NFPA ballot resulted in four approval votes, zero disapprovals and two abstentions. No comments were received.

At the 19 September 2007 joint meeting of NFPA/T3.21 and U.S. TAG to ISO/TC 131/SC 5/Pneumatic, a motion was approved to ask the NFPA Technical Board for approval to publish the document. At its 10 January 2008 meeting, the Technical Board approved a motion to publish the document.

Project Group members who developed this standard:

Gary Baumgardner
Project Group Chairman
Parker Hannifin Corp.

Carrie Tatman Schwartz
Industry/National Standards Development
Manager
National Fluid Power Association

James Rosenbury
Section Chairman
Nass Controls LP

Phillip Robinson
Technical Auditor
Parker Hannifin Corp.

/cts

Introduction

In pneumatic fluid power systems, power is transmitted and controlled through a gas under pressure within an enclosed circuit. One factor governing the selection of individual components is the ability to pass system flow without undue power loss. A flow rating parameter provides one means for identifying flow performance of a pneumatic component.

Pneumatic fluid power — Flow rating test procedure and reporting method — For fixed orifice components

1 Scope and field of application

NOTE This method is to be used as an alternative to ISO 6358, which is recognized as the preferred flow rating test procedure and reporting method.

1.1 To define a rating parameter, test method, and method of reporting flow in fixed orifice pneumatic fluid power components.

1.2 To promote better pneumatic fluid power systems by providing manufacturers and users of components with an easily understood standard means of developing, verifying and communicating pneumatic flow ratings.

This standard does not apply to control valves used in flow control of process fluids, as defined in Fluid Control Institute standards ANSI/FCI 68-1 and ANSI/FCI 68-2.

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 Standards. Standards development organization contact information and links can be found on the NFPA website (www.nfpa.com).

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*

ISO 1219-2 (*latest edition*), *Fluid power systems and components — Graphic symbols and circuit diagrams — Part 2: Circuit diagrams*

ISO 5598 (*latest edition*), *Fluid power systems and components – Vocabulary*

ISO 6358 (*latest edition*), *Pneumatic fluid power – Components using compressible fluids – Determination of flow-rate characteristics*

3 Terms and definitions

For definition of terms used, see ISO 5598.