AMERICAN NATIONAL STANDARD

ANSI/(NFPA)
T2.13.1 R3-1998
Fourth Edition
20 February 1998

AMERICAN NATIONAL STANDARDS INSTITUTE • A NATIONAL STANDARD FOR FLUID POWER

Recommended practice — Hydraulic fluid power — Use of fire-resistant fluids in industrial systems

(Revision and redesignation of ANSI/B93.5-1979)

SPONSOR

National
FLUID POWER
Association

Descriptors: hydraulic fluids; fluid power, changing fluids in a system, contamination, corrosive properties, effects on elastomers, effects on protective coatings, effects on strainers and filters, foaming and aeration, operating temperatures, piping and accessory precautions, product descriptions, safety in exposure to fluid, spills, viscosity control, wear resistant characteristics..

AMERICAN NATIONAL STANDARD

This American National Standard is one of more than 10,000 standards approved as American National Standards by the American National Standards Institute. On 24 August 1966, the ASA was reconstituted as the USA Standard Institute; on October 1969, the USASI changed its name to the American National Standards Institute. Standards formerly designated as ASA or USASI are now designated as ANSI Standards. There is no change in their index identification or technical content.

An American National Standard implies a consensus of those substantially concerned with its scope and provisions. An American National Standard is intended as a guide to aid the manufacturer, the consumer and the general public. The existence of an American National Standard does not in any respect preclude anyone, whether they have approved the standard or not, from manufacturing, marketing, purchasing or using products, processes or procedures not conforming to the standard. An approved ANSI Standard does 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. American National Standards are subject to periodic review and users are to obtain the latest editions. Producers of goods made in conformity with an American National Standard are encouraged to state on their own responsibility in advertising, promotional material or on tags or labels that the goods are produced in conformity with particular American National Standards.

NOTICE: An approved ANSI standard does 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 of safety of any product or component, even those which may incorporate one or more ANSI standards. Approved ANSI standards 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 ANSI standards.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken to reaffirm, revise, or withdraw this standard no later than five (5) years from the date of publication. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036-8002, (212) 642-4900. Information on this and other FLUID POWER standards may also be obtained by calling or writing the National Fluid Power Association, 3333 North Mayfair Road, Milwaukee, WI 53222-3219, (414) 778-3344.

Suggestions for improvement gained in the use of this standard will be welcome. They should be sent to the American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036-8002.

Any part of this standard may be quoted. Credit lines should read: Extracted from American National Standard Recommended practice — Hydraulic fluid power — Use of fire-resistant fluids in industrial systems (Revision and redesignation of ANSI/B93.5-1979), ANSI/(NFPA) T2.13.1 R3-1998.

Published by
NATIONAL FLUID POWER ASSOCIATION, INC.

Foreword

This Foreword is not part of American National Standard *Recommended Practice — Hydraulic fluid power — Use of fire-resistant fluids in industrial systems*, ANSI/(NFPA) T2.13.1 R3-1998 (Revision of ANSI/B93.5-1978).

On 8 July 1994, ANSI/B93.5-1979 (T2.13.1 R2) was sent to ANSI Committee B93 for reaffirmation. One negative ballot was received with many comments. This comment was sent to the Fluids Technology Committee Chairman, Paul Schacht, to review. He suggested sending the comments to David Carson, Pall Corp. since he was on the original Project Group. David Carson agreed that the comments were valid and that the document should be revised.

Both Paul Michael, Benz Oil, and George Totten, Union Carbide, agreed to serve as Project Co-Chairmen. The TSP was approved by the Technical Board at their 13 April 1995 meeting.

Project Co-Chairman Michael, reviewed the document and noted the changes that should be made. This list was reviewed at the 21 September 1995, T2.13 meeting. Two changes were made to this list and Project Co-Chairman Totten was asked to revise clause 8 since he is an authority on water-glycol hydraulic fluids.

The document was updated at Headquarters on 12 October 1995 and marked as Draft No. 2. A revised draft from Co-Chairman Paul Michael was received at Headquarters on 17 November 1995. These changes were incorporated into the document.

At the 13 February 1996 T2.13 meeting it was voted on to make a few minor changes to the document and send it out for General Review. The document was updated and sent out for General Review on 9 April 1996. The General Review closed with comments from four companies. The comments were discussed at the 19 September 1996 T2.13 meeting. Letters to the commentators were sent out on 3 October 1996. All of the commentators signed off by 22 October 1996.

The document was granted approval to Ballot at the 5 December 1996 Technical Board meeting. The document was sent out for Ballot on 17 December 1996.

On 8 May 1997 the T2.13 Fluids Technology committee unanimously agreed to send the document to the Technical Board for final approval. The Technical Board met on 14 August 1997 and voted to approve this document and send to ANSI B93 for their approval.

Project Group members who developed this standard:

Paul Michael
Project Co-Chairman &
Fluids Technology Committee Secretary
Benz Oil

George Totten
Project Co-Chairman
Union Carbide Corp.

Paul Schacht
Fluids Technology Committee Chairman
Bosch Automation Technology

Thelma Marougy
Fluids Technology Committee Vice Chairman
Aeroquip-Vickers, Inc.

Richard Klimaszewski
Technical Auditor
Denison Hydraulics Inc.

Jean Flesch
Technical Coordinator
National Fluid Power Association

Shirley C. Seal
Manager of Standards Development
Industry/National
National Fluid Power Association

On 29 August 1997, ANSI/(NFPA) T2.13.1 R3 was submitted to ANSI Committee B93 for Ballot. Balloting closed with no negative ballots. This document was grated final approval on 20 February 1998.

The membership roster of Standards Committee B93 at the time of Ballot:

Jack C. McPherson
Chairman

Daniel B. Shore
Vice Chairman

Shirley C. Seal
Secretary

American Society of Agricultural Engineers
W. L. Snyder*

Association for Manufacturing Technology
Anthony Bratkovich

Compressed Air & Gas Institute
John Wiskamp
John Addington (alternate)

Fluid Controls Institute, Inc.
Jude Pauli
John Addington (alternate)

Fluid Power Society
Probir K. Chatterjea
Art DesMarais III
Greg Gordon
Ray Hanley
Bernard Larson
Paul Prass (alternate)
N. Pliny Smith
James J. Staczek

Fluid Sealing Association
Stephen B. Chapman
Robert Ecker (alternate)

Material Handling Institute
Jack C. McPherson

National Fluid Power Association
John Berninger
David Prevallet
Paul Schacht
William Wilkerson

US Department of Defense
Wayne K. Wilcox

*Retired

Company Members
Dennis Bonacorsi
John Welker (alternate)
Logan Mathis

Individual Members
John Eleftherakis
Russ Henke
Richard Pettibone
A. O. Roberts
Daniel B. Shore
Vince Torrusio
Jack Walrad
Tom Wanke
James C. White
Frank Yeaple

/jmf

Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. One kind of fluid is a fire resistant fluid. A fire-resistant fluid is defined as “a fluid difficult to ignite which shows little tendency to propagate flame.” Fire-resistant properties vary widely among the types of fluids. Therefore, fluid selection will depend on the type of hazard and equipment involved. Fluid suppliers should provide information on fire tests performed which relate to the intended application.

In general, industrial fluid power equipment is designed for use with petroleum oils. When such systems are converted to use fire-resistant fluids, reevaluate the design features, test requirements, operational techniques, maintenance procedures, and life expectancy of components. Since this practice presents only generalized recommended practices for the use of fire-resistant fluids, consult suppliers of fire- resistant fluids, as well as the component manufacturers for detailed consideration of any problem or complication which may arise.

Consider the environmental impact of these fluids prior to their use. Detailed discussion of this consideration is covered in another document, ANSI/(NFPA)T2.13.4.

Information given in fluid suppliers specification sheets shows that fire-resistant fluids differ widely in physical properties as well as in general lubrication values. Therefore, special consideration should be given to general lubrication values and fire resistance.

Recommended practice — Hydraulic fluid power — Use of fire-resistant fluids in industrial systems

1 Scope

This practice provides a general educational publication covering the following aspects of each of the general industrial types of fire-resistant fluids used in hydraulic fluid power systems:

– product description;

– operating temperatures;

– foaming and aeration;

– corrosive properties;

– effects on protective coatings;

– wear resistant characteristics;

– viscosity control;

– fluid stability;

– safety in exposure to fluid;

– spills;

– contamination;

– effects on strainers and filters;

– effects on elastomers;

– piping and accessory precautions;

– changing fluids in a system.

This practice will:

– provide a composite reference of pertinent general data on fire-resistant fluids;

– facilitate the design of industrial fluid power systems that use fire-resistant fluids;

– improve the operation and increase the reliability of fluid power systems using fire-resistant fluids;

– clarify the maintenance of fire-resistant fluids;