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NFPA/T2.9.11 R1-1999 (R2004)
Second edition
18 May 1999

AN INDUSTRY STANDARD FOR FLUID POWER

Hydraulic fluid power — Method for determining the particulate count of an oil sample (using liquid automatic counters)

(Revision of ANSI/(NFPA)T2.9.11-1989)

Descriptors: hydraulic fluid power systems; particulate count; liquid automatic particle counters; free water; petroleum based oil samples.

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Foreword

This Foreword is not part of National Fluid Power Association Recommended Standard *Hydraulic fluid power — Method for determining the particulate count of an oil sample (using liquid automatic counters)*, (Revision of ANSI/(NFPA)T2.9.11-1989), NFPA/T2.9.11 R1-1999.

At the 25 May 1994, T2.9 meeting the document ANSI/(NFPA)T2.9.11-1989 was on the agenda for Five-Year Review. It was voted to reaffirm this document until a revision was completed. Marvin Gram, Donaldson Co., agreed to serve as Project Chairman.

At the 21 September 1994, T2.9 meeting the title and scope of the document were changed and approved. The TSP was approved by the Technical Board at their 8 December 1994 meeting. A revised document was given to Headquarters staff at the 24 May 1995, T2.9 meeting.

The document was updated and sent to Project Chairman Gram on 16 June 1995. After a few more changes were made, the document was sent out for Project Group review on 18 July 1995. The Project Group review closed with four sets of comments which were reviewed and incorporated into the document at the 20 September 1995 Project Group meeting. At this meeting it was voted to send the revised document out for General Review. Headquarters received a revised document on 24 September 1995.

The document was sent out for General Review on 14 November 1995. The General Review closed with comments from five companies. These comments were discussed at the 14 February 1996 T2.9.11 R1 Project Group meeting. Early in May 1996 letters were sent out to the commentators. By early August 1996 all the commentators had signed off on their comments. The document was updated and received at Headquarters on 1 November 1996.

The Project Chairman made a few more changes to the document and it was sent out for a Second General Review on 15 November 1996. Comments were received from seven companies. On 22 March 1997 letters were sent to all of the commentators. By 11 April 1997 all of the commentators had signed off. A revised document was received at Headquarters on 14 April 1997. The document was updated and sent out for a 10 day Project Group review on 21 April 1997.

The document was sent out for Ballot Draft on 3 June 1997. Balloting closed on 18 July 1997 with two negative comments. By 31 October 1997 both commentators had signed off on their comments. On 12 November 1997 a new round robin was started to be used to support data for the document. Also on 12 November 1997, a revised copy of the document was received from Chairman Gram.

The document was granted final approval contingent upon the results of the round robin being added to the document at the 4 December 1997 Technical Board meeting. It was also agreed upon to send the completed document to ANSI for adoption.

Changes to Table B.2 were received from Project Chairman Gram on 26 August 1998 and a few changes to the document were received on 31 August 1998. These changes were incorporated into the document and it was reviewed by T2.9 at their 30 September 1998 meeting.

At the 10 February 1999 project group meeting, a motion was made to revise the document per editorial comments received from the 27 January 1999 annex approval ballot.

Project Group members who developed this standard:

Marvin Gram

Project Chairman &
Technology Committee Vice Chairman
Donaldson Co.

Barry Verdegan

Technology Committee Chairman
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Bruce Coffey

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Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. A uniform, reproducible method is desired to enable a user to analyze the liquid of a system in terms of particulate counts.

This is a preview of "NFPA/T2.9.11 R1-1999...". [Click here to purchase the full version from the ANSI store.](#)

Hydraulic fluid power — Method for determining the particulate count of an oil sample (using liquid automatic counters)

1 Scope

1.1 This standard includes a method for determining the representative particulate count of an oil sample from a hydraulic fluid power system using a liquid automatic particle counter (APC).

1.2 This standard is suitable for the monitoring of:

- the contamination level in hydraulic systems;
- the progress of a flushing operation or working system;
- support equipment;
- packaged stock.

1.3 This technique is only applicable to homogeneous liquids and light extinction particle counters.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the document indicated below. NFPA maintains registers of currently valid NFPA/ANSI standards.

ANSI/(NFPA)T2.9.14-1994, *Hydraulic Fluid Power — Fluid Contamination — Determination of Solid Contaminant level by the gravimetric level*

ANSI/B93.2-1986, *Fluid power systems and products — Glossary.*

ANSI/B93.20M-1972, *Hydraulic fluid power — Fluid sample containers — Qualifying and controlling cleaning methods.*

ANSI/B93.19M-1972, *Hydraulic fluid power — Particulate contamination analysis — Extraction of fluid samples from lines of an operating system.*

ANSI/B93.30M-1980, *Hydraulic fluid power — Contamination analysis data — Reporting method.*

ANSI/IEEE 268:1992, *Metric Practice.*

ANSI/ASQC Z1.4-1981, *Sampling Procedures and Tables for Inspection by Attributes.*

ASTM D 95-1983, *Test Method for Water in Petroleum Products and Bituminous Materials by Distillation.*

Federal standard 209E-1992, *Airborne particulate cleanliness classes in clean rooms and clean zones.*

ISO 1000:1992, *SI units and recommendations for the use of their multiples and of certain other units.*