



**NFPA Recommended Standard
NFPA/T3.4.7 R2-2000 (R2009)**

Third edition
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AN INDUSTRY STANDARD FOR FLUID POWER

**Accumulator – Pressure rating supplement to
NFPA/T2.6.1 R2-2000, Fluid power components – Method for
verifying the fatigue and establishing the burst pressure ratings
of the pressure containing envelope of a metal fluid power
accumulator**

(Revision of NFPA/T3.4.7 R1-1994)

Descriptors: accumulator hydraulic fluid power fluid power pressure cyclic test pressure rated fatigue pressure rated burst pressure burst test pressure rating by similarity pressure rating by test pressure rating

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Foreword

This Foreword is not part of NFPA Recommended Standard *Accumulator – Pressure rating supplement to NFPA/T2.6.1 R2-2000, Fluid power components – Method for verifying the fatigue and establishing the burst pressure ratings of the pressure containing envelope of a metal fluid power accumulator*, NFPA/T3.4.7 R2-2000.

The project was initiated on 11 February 1997 and the TSP was approved by the Technical board on 10 April 1997. The first draft was an update to coordinate the document with the updated NFPA/T2.6.1 R2. Both were issued for general review on 30 December 1998. Comments were reviewed at the T2.6 committee meeting of 9 February 1999, and proposed changes were reviewed by the T3.21 committee at its meeting of 18 May 1999. The ballot draft was prepared by NFPA headquarters on 2 August 1999. There were no negative ballots and the Technical Board granted final approval on 18 November 1999.

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Introduction

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit.

There are many ways in which internal pressure loads are imposed upon an accumulator. This standard considers a broad range of waveforms but within prescribed time limits, temperatures, environmental conditions and only upon certain metals. It is anticipated that these limitations could still provide sufficient common ground for comparing products. This rating method, therefore, provides the system designer with certain information to assist in a selection of accumulator(s) for an application. The designer still has the responsibility to consider the other loading characteristics described above and to determine how they might affect the accumulator's ultimate pressure retaining capability.

There are many standards already in existence for pressure rating accumulators (e.g. maximum allowable operating pressure) and this standard is not intended to displace them. Instead, a method of fatigue verification is provided.

Accumulator – Pressure rating supplement to NFPA/T2.6.1 R2-2000, Fluid power components – Method for verifying the fatigue and establishing the burst pressure ratings of the pressure containing envelope of a metal fluid power accumulator

1 Scope

1.1 This standard provides:

- test and statistical methods for generating fatigue distribution data;
- test and statistical methods for conducting a verification of the pressure ratings on fluid power accumulators;
- common requirements and an industry-wide philosophy in judging one type of pressure capability for fluid power accumulators;
- uniform methods of product comparison.

1.2 This standard covers the pressure containing envelope of the following accumulator types:

- piston;
- bladder;
- diaphragm;
- direct acting;
- mechanical;
- mechanical spring;
- mechanical weighted;
- metal bellows;
- gas bottles, are also included, only when they are used as an extension of the gas volume of one of the above mentioned accumulators.

1.3 This standard limits conditions as follows:

Follow 1.2 from NFPA/T2.6.1 R2.

1.4 This standard encourages manufacturers to use this common method to enhance the credibility of their pressure ratings.

2 Normative references

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

ASTM E466 1996, *Standard Practice for Conducting Force Controlled Constant Amplitude Axial Fatigue Tests of Metallic Materials*.