

ICS 49.080
CCS V 20



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 46719.3-2026

**Aerospace - Hydraulic filter elements test methods - Part 3:
Filtration efficiency and retention capacity**

航空航天 液压滤芯试验方法 第3部分：过滤效率和截留能力

(English Translation)

Issued on: May 25, 2026

Implemented on: December 1, 2026

Issued by: State Administration for Market Regulation

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative References	
3 Terms and Definitions	
4 Symbols	
5 Experimental Procedure	
6 Test equipment	
7 Instrument Accuracy and Test Conditions	
8 Validation of Experimental Equipment	
8.1 Validation of the Flow Stabilization Filter Test System	
8.2 Validation of the Flow Pulsation Filter Test System	
8.3 Validation of the sludge injection system	
9 Information required before the experiment	
10 Preparations before the experiment 11.	
10.1 Assembly of the test filter	
10.2 Sewage Injection System	
10.3 Flow Stabilization Filter Test System	
10.4 Flow Pulsation Filter Test System	
11 Filter Cartridge Filtration Efficiency Test	
11.1 Flow stability test	
11.2 Flow pulsation test	
12 Data Processing and Recording	
12.1 Filtration ratio and retention capacity	
12.2 Calculation of the number of stable particles in the flow pulsation test	
13 Notes	
Appendix A (Informative) Technical Differences between this Document and ISO 14085-3:2024 and the Reasons Therefor	
Appendix B (Normative) Test Media for Evaluating the Performance of Hydraulic Filter Elements	
B.1 Properties of Mineral Base Oils	
B.2 Additives	
B.3 Performance of Refined Oil	

B.4 Color of the finished oil

B.5 Qualified test medium

B.6 Static conductivity

Appendix C (Informative) Guidelines for Experimental System Design

C.1 Overview

C.2 General Principles

C.3 Filter Cartridge Testing System

C.4 Sewage Injection System

References

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 3 of GB/T 46719 "Test Methods for Aerospace Hydraulic Filter Elements". GB/T 46719 has been published as follows.

Part 2.

---Part 1: Experimental Sequence;

---Part 2: Regulatory Role;

---Part 3: Filtration Efficiency and Retention Capacity;

---Part 4: Validation of Crushing/Rupture Pressure Rating;

---Part 5: Resistance to Flow Fatigue;

---Part 6: Cleanliness Levels this document is modified to adopt ISO 14085-3:2024 "Aerospace series hydraulic filter elements - Test methods - Part 3: Filtration efficiency and cut-off".

Retaining ability.

This document differs significantly from ISO 14085-3:2024. The relevant clauses are indicated in vertical margins.

Straight lines (|) are marked. A summary of these technical differences and their reasons can be found in Appendix A.

The following editorial changes have been made to this document.

---To align with existing standards, the standard title has been changed to "Test Methods for

Aerospace Hydraulic Filter Elements - Part 3: Filtration Efficiency and... "Interception Capacity"

- The pressure difference symbol " Δp " has been removed from section 3.3;
- The description of index number 2 in Figure 2 has been changed, replacing "filter element ultimate pressure difference" with "net pressure difference";
- Added table titles to the tables in Chapter 4 and named them "Table 1 Letter Symbols";
- Added the letter symbols "m2.5%" and "m80%" from Chapter 4;
- The serial numbers of Tables 1 to 5 in the file have been changed to Tables 2 to 6;
- The notation for the upstream basic weight contamination predefined value in 10.2.2 has been changed from " c_i " to " c_b ";
- The notation for the initial volume of the sludge injection system in version 10.2.8 has been changed from " V_{ii} " to " V_i ";
- The symbol for the test flow rate in 11.2.1 has been changed from " q_t " to " q_f ";
- The symbol for the predefined sewage injection flow rate in 11.2.9 has been changed from " c_i " to " q_i ";
- The sign for the average upstream basic weight contamination level in 12.1.12 has been changed from " c_b " to " cb ";
- The symbol in formula (19) has been changed, replacing " q_i " with " qi ";
- The symbol in the note in 12.1.14 has been changed from " c_b " to " cb ";
- The description of the record location in section 12.2 has been changed from "recorded in Tables 4 and 5" to "recorded in Table 6";
- The symbols in formulas (25) and (26) have been changed, with "c2.5%" changed to "m2.5%" and "c80%" changed to "m80%".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the National Aircraft Standardization Technical Committee (SAC/TC435).

Introduction

GB/T 46719 aims to provide a unified and consistent procedure for performance testing of aerospace hydraulic filter elements, and is proposed to consist of six parts.

---Part 1: Test Sequence. The purpose is to specify the test sequence and provide guidelines for acceptance criteria.

---Part 2: Regulation. This section describes the filter element's thermal conditions and cold start test procedure.

---Part 3: Filtration Efficiency and Retention Capacity. This section describes the test procedures for the filtration efficiency and retention capacity of filter cartridges.

---Part 4: Crushing/Rupture Pressure Rating Verification. This section describes the crushing/rupture pressure testing procedure for filter elements.

---Part 5: Resistance to Flow Fatigue. The purpose is to describe the test procedures for the filter element's resistance to flow fatigue.

---Part 6: Cleanliness Class. This section describes the test procedures for the initial cleanliness of the filter element.

In aerospace hydraulic fluid power systems, power is transmitted and controlled through pressurized fluid. This fluid serves as both a lubricant and a...

It is the power transmission medium. The presence of solid contaminant particles in the liquid can interfere with the lubrication ability of the hydraulic oil and lead to wear and failure of components.

The degree of contamination in the fluid directly affects the system's performance, reliability, and safety, and needs to be controlled within the system's permissible level.

There are several methods to control system contamination levels by removing solid contaminants, one of which is to use a filter cartridge encapsulated in a housing.

Filter cartridges achieve filtration through porous media. A filter is a complete device used to achieve system filtration.

The performance characteristics of a filter depend on the filter element (its media and geometry) and the housing (its overall structure and sealing design). For specific...

The actual performance of a filter is also related to fluid characteristics (viscosity, temperature, conductivity, etc.), suspended particles (size, shape, hardness, etc.), and flow conditions.

Related to the item.

A standard multi-pass method for evaluating the filtration performance of hydraulic filter elements under stable flow conditions has been developed and used for many years, and it has been cited in the hydraulic system specifications of many aircraft.

Most hydraulic fluid systems experience flow pulsations, a state of unstable flow, due to actuator actions and other factors.

This will have a significant impact on filter performance. To select the most suitable filter, it is necessary to compare the relative performance of different filters. To ensure this...