

# European Aviation Safety Agency

## European Technical Standard Order

**Subject:** FUEL FLOWMETERS

### 1 - Applicability

This ETSO gives the requirements which fuel flowmeters that are manufactured on or after the date of this ETSO must meet in order to be identified with the applicable ETSO marking.

### 2 - Procedures

#### 2.1 - General

Applicable procedures are detailed in CS-ETSO Subpart A.

#### 2.2 - Specific

None.

### 3 - Technical Conditions

#### 3.1 - Basic

##### 3.1.1 - Minimum Performance Standard

Standards set forth in the SAE Aeronautical Standard AS-407B „Fuel Flowmeters“, revised March 1, 1960, and reconfirmed May 1991, as amended and supplemented by this ETSO:

Exceptions:

- (i) Correction to Section 1. of AS 407B: As referenced in this ETSO, AS 407B specifies minimum requirements for fuel flowmeters for use on reciprocating engines or turbine-powered civil aircraft. In addition, the following specifically numbered subparagraphs in AS 407B do not concern minimum performance and, therefore, it is not essential to show compliance with this paragraphs: 3.1, 3.2 and 4.2.1.
- (ii) Thermal shock: This test shall apply to any hermetically sealed components. The components shall be subjected to four cycles of exposure to water at  $85^{\circ}\pm2^{\circ}$  and  $5^{\circ}\pm2^{\circ}\text{C}$  without evidence of moisture penetration or damage to coating or enclosure. Each cycle of the test shall consist of immersing the component in water at  $85^{\circ}\pm2^{\circ}\text{C}$  for a period of 30 minutes and then within 5 seconds of removal from the bath, the component shall be immersed for a period of 30 minutes in the other bath maintained at  $5^{\circ}\pm2^{\circ}\text{C}$ . This cycle shall be repeated continuously, one cycle following the other until four cycles have been completed. Following this test, the component shall be subjected to the Sealing test specified in (ii). No leakage shall occur as a result of the test.
- (iii) Sealing: This performance test shall apply to any hermetically sealed components. The component shall be immersed in a suitable liquid, such as water. The absolute pressure of the air above the liquid shall then be reduced to approximately 34 hPa (1 inch of mercury (Hg)) and maintained for 1 minute, or until air bubbles cease to be given off by the liquid, whichever is longer. The absolute pressure shall then be increased by 85 hPa (2 1/2 inches Hg). Any bubbles coming from within the indicator case shall be considered as leakage and shall be cause for rejection. Bubbles which are the result of entrapped air in the various exterior parts of the case shall not be considered as leakage. Other test methods which provide evidence equal to the immersion test of the integrity of the instrument's seals may be used. If the component incorporates non hermetically sealed appurtenances such as a case extension, these appurtenances may be removed prior to the Sealing test.

(iv) Correction to subparagraph 3.3.1: Under column A, the temperature values for unheated areas (Temperature Uncontrolled) shall be -55° to 70°C.

**3.1.2 - Environmental Standard**

The conditions and procedures prescribed in AS 407B are to be used.

**3.1.3 - Computer Software**

See CS-ETSO Subpart A paragraph 2.2

**3.2 - Specific**

None.

**4 - Marking**

**4.1 - General**

Marking is detailed in CS-ETSO Subpart A paragraph 1.2. In addition, the range (transmitters only) and electrical rating shall be shown.

**4.2 - Specific**

None.

**5 - Availability of Referenced Document**

See CS-ETSO Subpart A paragraph 3.