



AEROSPACE STANDARD

AS5751™

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Design and Operating Requirements of the Onboard Aircraft Refueling System and Associated Ground Refueling Equipment Interface

RATIONALE

The purpose of this SAE Aerospace Specification is to establish and disseminate the minimum recommended design and operating requirements of the aircraft refueling interfaces. This specification sets the minimum criteria for aircraft manufacturers and aircraft refueling equipment manufacturers to design compatible aircraft refueling operating systems that interface and operate with the same minimum requirements in all steady state and dynamic aircraft refueling and defueling conditions.

AS5751 has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

This SAE Aerospace Specification (AS) is applicable to all aircraft.

This AS defines the minimum design and operating requirements for the aircraft refueling interface. These requirements establish the minimum criteria for the aircraft design that provides practical standardized refueling system requirements, provides minimum standardized criteria for the operation and performance of any aircraft refueling equipment, and establishes an integrated minimum performance for aircraft refueling operations. This standardization provides the minimum design criteria to assure full compatibility between the aircraft refueling system connection point(s), aircraft operating characteristics, and the design and operation of ground based aircraft refueling equipment in all steady state and dynamic refueling and defueling conditions. The criteria that shall be used to test the operation and performance of the aircraft refueling system and equipment are also specified. Compliance to this AS shall be deemed to mean that the aircraft or aircraft refueling equipment are in compliance with this standard when the refueling system is tested as per the test requirements specified in ARP5918 (mobile systems).

This document covers all types of ground aircraft refueling operations using stationary refueling equipment (e.g., cabinet type units) and mobile refueling vehicles (e.g., hydrant service vehicles, tankers, towable carts, etc.), to fuel aircraft with jet fuel that meets ASTM D1655, ASTM D6615, or DEF-STD-91-91 (including those fuels with synthetic blending components conforming to ASTM D7566). This document also covers fueling with other commercially available and approved fuels such as Gost TS-1 and Chinese jet fuel No. 3. Fuel quality control as detailed in A4A (Airlines for America) Specification 103 and/or EI 1530 is expected to be applied. In addition, the following military standards are also pertinent and referenced: MIL-DTL-5624 or MIL-DTL-83133 listed herein.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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Documents
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2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org

AIR1184	Capacitive Fuel Gauging System Accuracies
AIR4783	Glossary of Terms - Aircraft Ground Refueling
AIR5691	Guidance for the Design and Installation of Fuel Quantity Indicating Systems
ARP5298	Aircraft Fueling Adapter Wear Limits
ARP5818	Aircraft Refueling Vehicle Design and Performance Requirements
ARP5918	Standard Test Criteria for Aircraft Refuelers
ARP8615	Fuel System Components: General Specification For
AS5877	Detailed Specification for Aircraft Pressure Refueling Nozzle

2.1.2 EI Publications

Available from American Petroleum Institute, 1220 L Street, NW, Washington, DC 20005-4070, Tel: 202-682-8000, <http://api-ec.api.org>

EI 1581	Specification and qualification procedures for aviation jet fuel filter/separator
EI 1583	Laboratory tests and minimum performance levels for aviation fuel filter monitors
EI/JIG STANDARD 1530	Quality assurance requirements for the manufacture, storage and distribution of aviation fuels to airports

2.1.3 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D1655	Standard Specification for Aviation Turbine Fuels
ASTM D6615	Standard Specification for Jet B Wide-Cut Aviation Turbine Fuels
ASTM D7566	Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons

2.1.4 Military Standards

JSSG-2009	Department of Defense Joint Services Specification Guide: Air Vehicle Subsystems
MIL-A-25896E	Adapter, Pressure Fuel Servicing, Nominal 2.5" dia.
MIL-DTL-5624	Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-DTL-83133	Turbine Fuels Aviation Kerosene Type, JP-8, NATO F-35, and JP-8 +100 (NATO F-37)
MIL-STD-810	Environmental Test Methods and Engineering Guidelines
MIL-STD-1568	Department of Defense Design Criteria Standard Materials and Processes for Corrosion Prevention and Control in Aerospace Weapons Systems
MS24484	Adapter, Pressure Fuel Servicing, Nominal 2.5 inch Diameter

2.1.5 A4A Publications

Available from Airlines for America (A4A), 1301 Pennsylvania Avenue, NW, Suite 1100, Washington, DC 20004, Tel: 202-626-4000, www.airlines.org.

A4A Specification 103 Standards for Jet Fuel Quality Control at Airports

2.1.6 ARINC Publications

Available from ARINC, 2551 Riva Road, Annapolis, MD 21401-7435, Tel: 410-266-4000, www.arinc.com.

ARINC 611-1 Guidance for the Design and Installation of Fuel Quantity Systems

2.1.7 FAA Publications

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov.

PART 25 Airworthiness Standards: Transport Category Airplanes, Subpart E Powerplant, Fuel System And Fuel System Components.

2.1.8 EASA Publications

Available from European Aviation Safety Agency, Ottoplatz, 1, D-50679 Cologne, Germany, Tel: +49 221 8999 000, www.easa.europa.eu.

Certification Specifications for Large Aeroplanes CS-25

2.1.9 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ISO 45 Aircraft – Pressure Refueling Connections

ISO 102 Aircraft Gravity Filling Orifices

2.1.10 IATA Publications

Available from International Air Transport Association, Publications Assistant, 800 Place Victoria, P.O. Box 113, Montreal, Quebec H4Z 1M1, Canada, Tel: 1-514-874-0202, www.iata.org.

Standard Into-Plane Fueling Procedures

2.1.11 CCR Nozzle/Adapter Specification MIL-PRF-52747 Nozzle Assembly, Closed Circuit Refueling (CCR), Standard and Arctic Service

2.2 Definitions

Definitions for terms or phrases as used in this document:

2.2.1 AIRCRAFT REFUELING EQUIPMENT

All ground based aircraft refueling equipment (i.e., hydrant vehicles and carts, cabinets, and tanker vehicles).

2.2.2 AIRCRAFT REFUELER OEM

The original equipment manufacturer of the ground based aircraft refueling equipment.

2.2.3 AIRCRAFT REFUEL SYSTEM

The portion of the aircraft's fuel system that handles the fuel from the aircraft refueling/defueling connection adapters (aircraft mounted refuel adapter entry point) up to the dispensing of the fuel into the aircraft's fuel tanks. This system includes airframe interface connection adapters, manifolds, plumbing, shutoff valves, control valves, and any other fuel handling components or systems that affect the flow or the loading of the aircraft's fuel tanks.

2.2.4 FUEL FILLER PORT

A normally capped fuel tank opening specifically intended to be used as a primary or secondary means of refueling an aircraft.

2.2.5 HLS (High Level Sensor)

Sensors installed internal to the aircraft fuel tank which provide a signal to close the aircraft refuel valves.

2.2.6 LIMIT (PROOF) PRESSURE

The pressure up to which the fuel system will function satisfactorily, including pressure transients (surges), throughout the life of the aircraft without any external leakage, failure and/or malfunction, or permanent deformation.

2.2.7 MAXIMUM OPERATING PRESSURE

A maximum steady state pressure (no-flow and flowing conditions) that the fuel system shall be able to sustain throughout the life of the aircraft without any external leakage, fatigue, failures and/or malfunction.

2.2.8 MINIMUM OPERATING PRESSURE

The lowest pressure during refueling (no-flow and flowing conditions) that the fuel system may experience that ensures satisfactory operation. (Note that at lower pressures systems may not function appropriately.)

2.2.9 OPEN PORT AIRCRAFT REFUELING

A means of refueling an aircraft via an open port, in which shut-off of flow into the aircraft is controlled by the individual operating the refueling nozzle. (This is also referred to as gravity or overwing refueling.)