Approved for Airline Operations

Re-Certify All Aircraft

Re-Certify All Engines

New Oper Limitation

Airworthiness Certification

ASTM Qualification (D4054)

D7566 New Annex
Drop-In Fuel

New Spec Non-Drop-In Fuel

Integated ASTM/FAA Process

Approved for Commercial Operations

Unchanged Operating Limitation
How ASTM D7566 Enables Drop-In Fuel

Production

Semi-Synthetic Fuel

Tighter Control of Fuel Properties

D7566

Re-Identified

Conventional Jet Fuel

Separate Tracking NOT Required

D1655

Operations

Conventional Jet Fuel

Re-Certification NOT Required

D1655
ASTM Specification Process (ASTM D4054)

**TIER 1**
- Specification Properties
- ASTM Specification

**ASTM Balloting Process**
- Accept
- Reject
- Re-Eval As Required

**TIER 2**
- Fit-For-Purpose Properties
- ASTM Review & Ballot

**TIER 3**
- Component/Rig/APU Testing
- OEM Review & Approval

**TIER 4**
- Engine/APU Testing
- ASTM Research Report

Keywords:
- ASTM Specification
- Fit-For-Purpose Properties
- Component/Rig/APU Testing
- Engine/APU Testing
- ASTM Research Report
Standard Practice for Qualification and Approval of New Aviation Turbine Fuels and Fuel Additives

Schematic of the overall qualification process for new fuels
Quote of the process

WHEN LIFE'S HARD KNOCKS GET YOU DOWN...

...JUST GET UP... DUST YOURSELF OFF...

-AND

KEEP MOVING FORWARD!
ASTM Task Force in ASTM D02-J6 Initiated in June 2010
Group of producers assembled (Fall 2010)
First task force meeting with engine OEMs at (Dec 2010 ASTM)
Task Force meetings held at both 2011 ASTM and CAAFI meetings
Task Force was broken into two main areas:
  – ATJ-SPK (paraffins) - Current Research Report
  – ATK-SKA (w/aromatics) – Drafting Research Report
Over 100,000 gallons of ATJ-SPK 50/50 blend has been produced and flown.
Gevo operates a demo scale facility in Silsbee, TX which has been operating 24/7 for the past 3 years producing ATJ-SPK.
Extensive testing has also been completed on ground diesel engines through work funded by US Army at SwRI.

ATJ-SPK Testing Completed
- AFRL Fit-for-Purpose testing – 2009-2013
- Rolls Royce AE3007 testing 2012
- GE TF34 engine testing 2012
- US AFRL A-10 flight 2012
- Goodrich fuel gauging analysis 2012
- Pratt & Wittney Canada PW 615F testing
- Honeywell G230 and 131-9 testing 2011.
ASTM D7566 Annex 5

Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons

1. Scope

1.1 This specification covers the manufacture of aviation turbine fuel that consists of conventional and synthetic blend components.

1.2 This specification applies only at the point of batch origination, as follows:

1.2.1 Aviation turbine fuel manufactured, certified, and released at the requirement of Table 1 of this specification (D7566) shall be considered as meeting the specifications of D6155 and shall be regarded as Specification D6155 turbine fuel. Duplicate testing is not necessary. The same data may be used for both D7566 and D6155 compliance. The fuel is released to this specification (D7566) and the unique requirements of this specification are no longer applicable; any certification shall be done in accordance with Table 1 of Specification D6155.

1.2.2 Fluid Staging of synthetic paraffinic kerosene (SPK) hydrocarbons, as described in Annex A1 (SPE) and Annex A2 (HEPA SPE), Annex A3 (PFB), synthetic paraffinic kerosene plus aromatics (SPKAR), or Annex A5 (ATJ) as described in Annex A4 with D6155 fuel (which may be the whole or in part or have originated as D7566 fuel) shall be considered batch origination in which case all of the requirements of Table 1 of this specification (D7566) apply and shall be evaluated. Short form certification test programs commonly used to ensure transportation quality are not sufficient. The fuel shall be regarded as D6155 turbine fuel after certification and released as described in 1.2.1.

1.2.3 Once a fuel is designated as D6155 turbine fuel, it can be handled in the same fashion as the equivalent blend of D6155 aviation turbine fuel.

1.3 This specification defines specific types of aviation turbine fuel that contain synthesized hydrocarbons for civil use. Data on the operation and certification of aircraft and describes fuels found satisfactory for the operation of aircraft engines. The specification is intended to be used as a standard in describing the quality of aviation turbine fuels and synthetic blending components at the place of manufacture but can be used to describe the quality of aviation turbine fuels for contractual transfer of all points in the distribution system.

1.4 This specification does not define the quality assurance testing and procedures necessary to ensure that fuel in the distribution system continues to comply with this specification after batch certification. Such procedures are defined elsewhere, for example in ICAO 9577, EASA Standard 1355, JO1, JO2, JO3, APS 1530, APS 1535, and APS 105.

1.5 This specification does not include all fuels satisfactory for aviation turbine engines. Certain equipment or conditions of use may permit a wider or require a narrower range of characteristics than is shown by this specification.

1.6 While aviation turbine fuels defined by Table 1 of this specification can be used in applications other than aviation turbine engines, requirements for other applications have not been considered in the development of this specification.

1.7 Synthetic blending components, synthetic fuels, and blends of synthetic fuels with conventional petroleum-derived fuels in this specification have been evaluated and approved in accordance with the principles established in Practice D4956.

1.8 The product name in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.9 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:

D2695 Test Method for Flash Point by Tag Closed Cup Tens

This standard is identical to the American Society for Testing and Materials  (ASTM) standard, and is accepted by the American Petroleum Institute (API) as API Standard 1522. The standard is subject to revision without notice, and the user is advised to obtain the latest edition before use.

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Thank you

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