

eraflash empowered to specify jet fuel

The latest jet fuel specifications ASTM D1655 and D7566 now allow the flash point to be determined using eralytics' eraflash flash point testers.



Introduction

Aviation has developed enormously since its beginnings around 1900 after the first attempts by the Wright Brothers. Today's society would be unthinkable without modern aviation. Countless aircraft are used for a wide variety of tasks in the field of commercial freight, passenger transport, and national defense. Regardless of their exact task and size, most aircraft are powered by gas turbine engines. These engines run on aviation turbine fuel also known as jet fuel, a fuel typically traded for civil applications under the names "Jet A" or "Jet A-1." Recently, synthetic fuels have also been used, either pure or in blends coming from various manufacturing processes based on biogenic or crude oil-based raw materials.

Standardization

With these critical products, special attention is paid to product quality and compliance with guidelines and standards. One of the most relevant product specifications for Jet A/A-1 is the ASTM D1655 – 25a standard. The technical difference between the more common Jet A-1

versus Jet A, which is mainly used in the USA, is the freezing point, which is slightly lower for "A-1" at -47 °C than for "A". Fully or partially synthetic aviation fuels, on the other hand, are specified according to ASTM D7566 – 25a.

In addition to the technically relevant parameters, safety plays a critical role in the aviation industry. This aspect also includes the flash point, which must not fall below 38 °C or 100 °F in either standard.

The limit value of 38 °C was established for aviation to ensure safe handling, fire safety, and proper combustion. In the guidelines on the transport of dangerous goods (ADR) and the classification and labeling according to GHS, this value has no direct equivalent and does not correspond to a typical limit value. Therefore, Jet A/A-1 is classified as UN 1863 and is defined as a flammable liquid (Class 3) with a flash point \leq 60 °C and is consequently labeled with GHS02.



Determination of the flash point

The reference test method for determining the flash point according to the specifications described above is the ASTM D56 Tag Closed Cup (TAG). This is similar to the Pensky-Martens (PM) flash point tester according to ASTM D93 in terms of the apparatus and the measurement procedure. The TAG method is commonly used for flash points below the PM measurement range, which is the case for Jet A/A-1 with 38 °C (100 °F).

With the latest version "25a" of ASTM D1655 and ASTM D7566, published in mid-January 2026, all **eraflash** flash point testers from **eralytics** may now also be used for the specification of jet fuel. The state-of-the-art flash point testers comply with ASTM 7094 Flash Point by Modified Continuously Closed Cup (MCCCFP) Tester.

Unbeatable measurement accuracy

In the course of standardization work and preparation for this groundbreaking normative improvement, the outstanding measurement accuracy of ASTM D7094 was once again proven with the inclusion of aviation turbine fuels.

The most comprehensive interlaboratory study (ILS) for flash point to date, carried out in 2022 (RR-D02-2086), involved 20 laboratories and 1000 measurements, covering a broad range of materials, including aviation turbine fuels, diesel, biodiesel blends, lubricants, and chemicals. The results shown in Figure 1 revealed that ASTM D7094 provides superior reproducibility across all tested materials and temperatures.

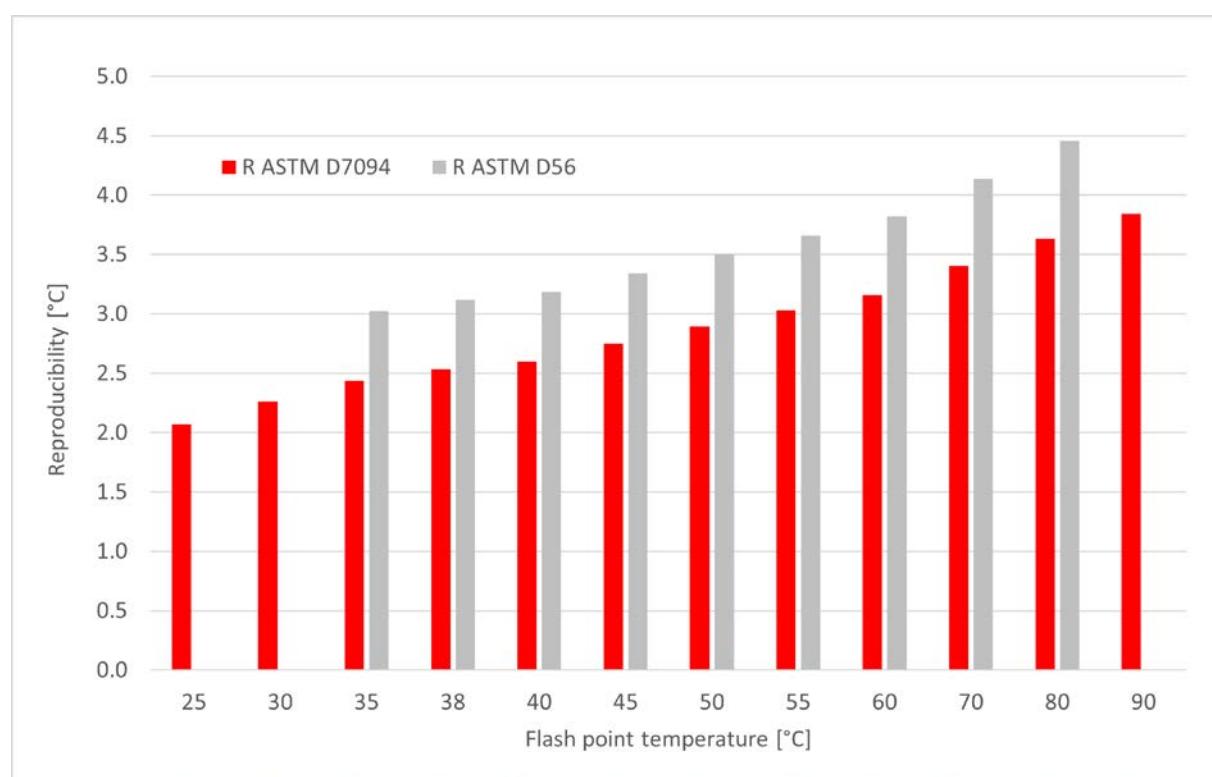


Figure 1: Reproducibility for ASTM D7094 as reported in research report RR-D02-2086. The corresponding values for ASTM D56 were obtained from ASTM D56-22.

The superior reproducibility of ASTM D7094 compared to other flash point methods for jet fuel is summarized in Figure 2.

Material	Flash Point [°C]	ASTM D7094 R [°C]	ASTM D93 R [°C]	ASTM D56 R [°C]
Jet fuels	40	2.6	2.8	3.1

Figure 2: Summary of reproducibility (R) for jet fuel according to typical standards

Conclusion

The recently updated ASTM specifications now allow the alternative use of measuring devices from the **eraflash** family to specify the flash point for jet fuel. These types of analyzers, which are superior in every respect, finally enable a modern determination of the flash point for all user groups.

The **eraflash** flash point testers, according to ASTM D7094, combine all the benefits of this outstanding method:

- Superior precision across the entire temperature range, even for contaminated samples
- Inherent safety, with no open ignition sources, eliminating fire hazards
- Twice as fast as ASTM D56, with the help of eralytics PBT® - Peltier Boost Technology
- Minimal sample volume (just 2 mL), reducing hazardous waste and follow-up time

Reference list

- ASTM D56 – 22 Test Method for Flash Point by Tag Closed Cup Tester
- ASTM D93 – 25 Test Methods for Flash Point by Pensky-Martens Closed Cup Tester
- ASTM D1655 – 25a Standard Specification for Aviation Turbine Fuels
- ASTM D7094 – 25 Standard Test Method for Flash Point by Modified Continuously Closed Cup (MCCCFP) Tester
- ASTM D7566 – 25a Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons
- RR-D02-2086 Research report: Interlaboratory study was conducted by 20 laboratories testing 25 samples to establish an updated precision statement for test method D7094

Note: All standards and the research report can be purchased at www.astm.org