

For the attention of Manufacturers and Suppliers of Jet fuel meeting ASTM D1655 or Def Standard 91-091

AROMATICS DETERMINATION BY FLUORESCENT INDICATOR ANALYSIS

Test method ASTM D1319 and IP156

Introduction

Typically, the ASTM international standard test method D1319 and Energy Institute test method IP156, “Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption” is specified as the required test method for aromatics measurement. However, a dye necessary to conduct that test is no longer available. In addition, recently delivered supplies of that dye with lot numbers 3000000975 and above were produced with an incorrect dye and will not provide accurate measurements of aromatic concentration.

When the aromatic level is needed to be determined, Jet A-1 fuel will only meet the aviation fuel operating limitations of airplanes certificated to operate on Jet A-1 fuel and the requirements of AFQRJOS Checklist 30 if:

- 1) the fuel has been tested for aromatics concentration in accordance with ASTM D1319/IP156 with a dye from lot number 3000000974 or lower
or
- 2) the fuel has been tested for aromatics concentration in accordance with the alternative test methods ASTM D6379/ IP436.

No other alternative test method, or method of deriving the aromatic content, is acceptable.

Aromatic hydrocarbons are limited in jet fuel because they emit more radiant energy during combustion than paraffinic hydrocarbons. At high concentrations, this can have an adverse effect on turbine engine combustor durability. They also produce more smoke and harmful particulate emissions than paraffinic hydrocarbons and are limited due to environmental concerns.

At this time, the FAA have issued a Special Airworthiness Information Bulletin (SAIB) on 14th November (SAIB HQ-18-30) that indicates that this airworthiness concern is not considered an unsafe condition that would warrant an airworthiness directive (AD) action. JIG is not aware of a similar information document issued by EASA at this time.

Background

ASTM International and the Energy Institute develop aviation fuel specifications and test methods (ASTM and IP) that aircraft engine and airframe manufacturers (OEMs) may designate as operating limitations for their approved products. The OEMs may also use these ASTM specifications and test methods to develop their own documents, such as company specifications, service bulletins and instructions, or other company documents, they designate as jet fuel operating limitations. These aviation fuel operating limitations may be listed in the product’s type certificate data sheet (TCDS), installation manual, service instructions, or as limitations associated with a supplemental type certificate (STC) for aircraft operation.

Aircraft and jet engine OEMs almost exclusively designate ASTM Standard Specification D1655, “Standard Specification for Aviation Turbine Fuels” and Defence Standard 91-091 as a jet fuel operating limitation.

ASTM D1655 and Defence Standard 91-091 specify a maximum allowable concentration of aromatics of 25 volume percent measured by the ASTM standard test method D1319 or equivalent IP156 test method. There is an alternative permitted method ASTM D6379/IP436 “Standard Test Method for Determination of Aromatic Hydrocarbon Types in Aviation Fuels and Petroleum Distillates—High Performance Liquid Chromatography Method with Refractive Index Detection” specified in ASTM D1655/Defence Standard 91-091 with a maximum allowable concentration of 26.5 volume percent.

Actions to Implement this Bulletin (See Table 2 for Action Type Codes)

Action Description	Action Type	Target Completion Date
1) Manufacturers and suppliers of jet fuel meeting ASTM D1655 or Defence Standard 91-091 should verify the aromatics concentration of jet fuel is being determined by an approved method. a. ASTM D1319 with a dye from lot number lower than 3000000975, or b. ASTM D6379/IP436.	RA	Immediate

Table 2 Action Type Codes

Action Types	JIG Bulletin Action Type Definition
JS	Change to JIG Standard – to be adopted by JV and/or Operator to continue to meet the JIG Standard(s) (JIG 1, 2, 4, EI/JIG 1530 and the JIG HSSE Management System).
RA	Required Action to implement one off verification or checks outlined in the table of actions.
RP	Recommended Practice which the location should consider adopting as its own practice (**).
I	Issued for information purposes only.
Note (**) - If the JV agreements require any of the JIG Standards and/or any of the JIG Common Processes as the governing operational standard then adoption of changes to applicable JIG Standards and/or Common Processes should not be considered optional by the JV Board.	

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