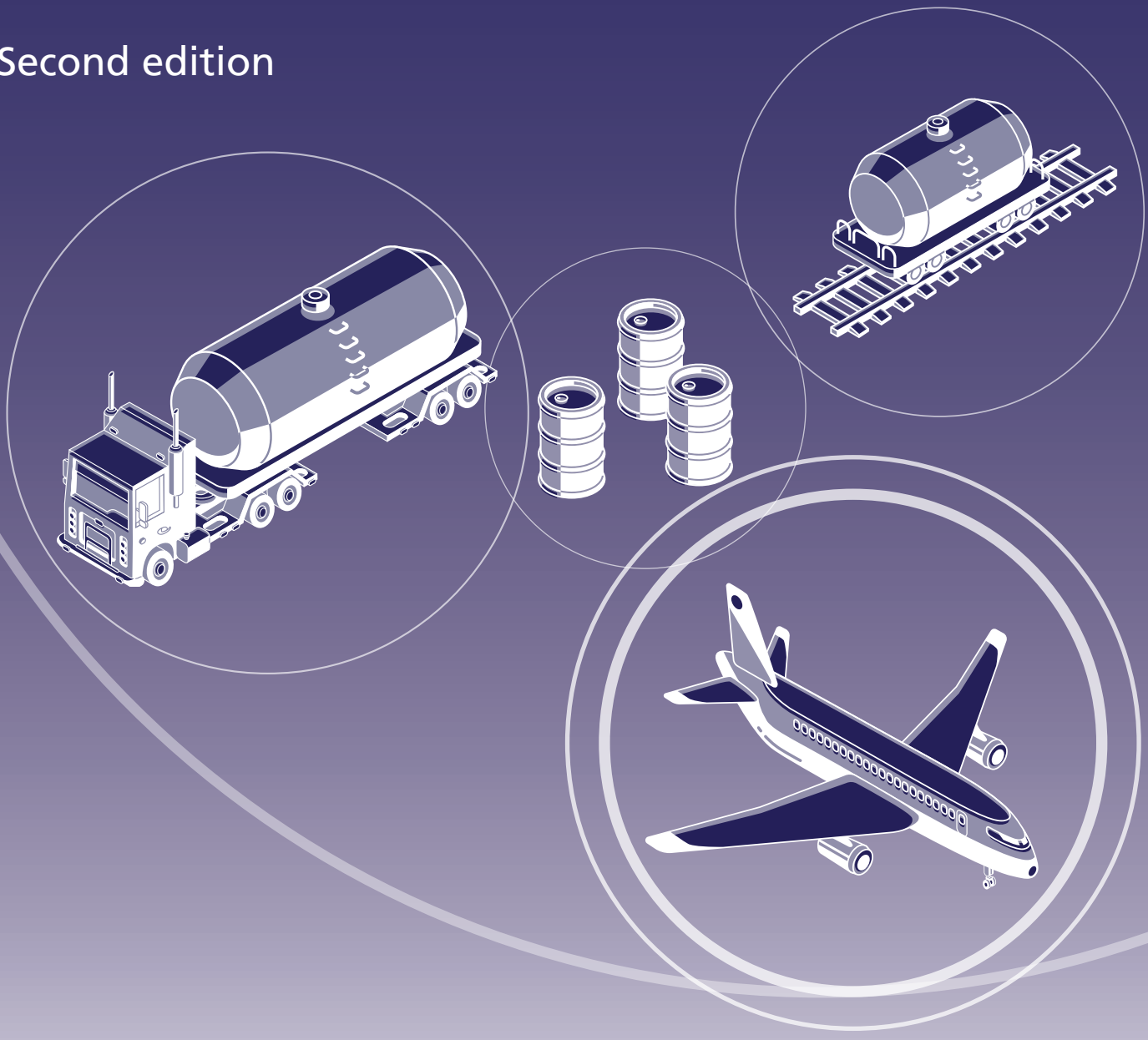
# EI/JIG Standard 1530

## Quality assurance requirements for the manufacture, storage and distribution of aviation fuel to airports

Second edition



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JIG

# QUALITY ASSURANCE REQUIREMENTS FOR THE MANUFACTURE, STORAGE AND DISTRIBUTION OF AVIATION FUELS TO AIRPORTS

## EI/JIG STANDARD 1530

2nd edition

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It also offers its own Chartered Energy Engineer, Chartered Petroleum Engineer, and Chartered Energy Manager titles.

A registered charity, the EI serves society with independence, professionalism and a wealth of expertise in all energy matters.

This publication has been produced as a result of work carried out within the Technical Team of the EI, funded by the EI's Technical Partners. The EI's Technical Work Programme provides industry with cost-effective, value-adding knowledge on key current and future issues affecting those operating in the energy sector, both in the UK and internationally.

For further information, please visit **http://www.energyinst.org**

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# FOREWORD

This publication has been prepared by the EI's Supply Chain Fuel Quality Sub-Committee, in conjunction with JIG.

EI/JIG 1530 is intended to provide a standard to assist in the maintenance of aviation fuel quality, from its point of manufacture to delivery to airports. It provides mandatory provisions and good practice recommendations for the design/functional requirements of facilities, and operational procedures. It is not intended to be a substitute for a site-specific operating and fuel quality control manual.

This publication is intended for adoption worldwide, by any company or organisation involved in the refining or handling of aviation fuel upstream of airports. This includes those companies/organisations responsible for the design, construction, operation, inspection or maintenance of refineries, pipelines, marine vessels, coastal/inland waterway barges, road tankers, rail tank cars or storage installations, aviation fuel testing laboratories and inspection companies.

Whilst written in the context of the legislative and regulatory framework generally applicable in the European Communities, the provisions set out in this publication can similarly be applied in other countries providing national and local statutory requirements are complied with. Where these requirements differ, the more stringent should be adopted.

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This publication is intended to assist those involved in the refining, distribution and supply of aviation fuel. Every effort has been made by the EI and JIG to assure the accuracy and reliability of the data contained in this publication; however, EI and JIG make no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaim any liability or responsibility for loss or damage resulting from its use or for the violation of any local or regional laws or regulations with which this publication may conflict.

Suggested revisions are invited and may be submitted to the Technical Department, Energy Institute, 61 New Cavendish Street, London, W1G 7AR (technical@energyinst.org) or to the Joint Inspection Group (via www.jigonline.com).

EI/JIG 1530 second edition contains a number of significant changes from the first edition, reflecting the large number of comments received from stakeholders for consideration and incorporation into this publication. For information, many of the major changes are listed below. However, this is not a full list of all the changes made. A line has been included in the margin of this publication alongside any text, tables or figures that have been amended from the first edition.

| Clause | Description of change |
|---|---|
| General | Standard made less jet fuel-specific with the inclusion of aviation gasoline (avgas) when appropriate. References to aviation fuel apply to both jet fuel and avgas. |
| General | References to requirements of specific aviation fuel specifications removed unless appropriate. |
| General | All references to Filter Monitors and EI 1583 removed. |
| General | All references to Periodic Testing removed throughout document, – requirement to retest fuel covered by 2.2.6, duration of validity of certificate. |
| General | Use of term isolate/isolated removed from document to avoid confusion with other uses of term (e.g. isolate electricity) definition removed from glossary. |
| 2.3 | Major redraft of section to provide further clarity and accommodation of fungible pipeline systems. Updated examples given in schematics including addition of fungible pipeline scenario. |
| 4.5.8 | Additional sections added to cover tests for particle counting, chloride contamination, microbiological growth (MBG), chemical water detector (CWD) and fuel system icing inhibitor (FSII). |
| 4.5.8.10 | Title changed to 'Requirements for field test laboratories and field-testing equipment' with additions to cover requirements of field-testing laboratories. |
| Chapter 5 | Title changed to 'Certifying laboratories' to distinguish from field testing laboratories. |
| Chapter 6 | Extensive additions to include reference to avgas grades and the manufacturing of avgas. |
| 7.3 | New sections added regarding leak detector additive, avgas dyes and tetraethyl lead (TEL) for avgas. |
| 8.3.3 | Single and multi-product pipeline receipt sampling requirements aligned. |
| 8.4.2 | Several options for reducing tank settling time added based upon tank design, additional sampling and testing, and whether supplying direct or indirect to airport service tanks. |
| 9.3.4 | Requirement for new tanks brought into aviation fuel service to have either fixed roof or dome cover changed to apply only to direct to airport service tanks. |
| 9.3.7 | Requirement for separate inlet and outlet lines for tanks is mandated for tanks delivering direct to airport service tanks or into grade-dedicated systems. Direct to airport service tank locations with single inlet/outlet lines shall be upgraded. Non-direct to airport locations with single inlet/outlet lines require procedures to manage line content. |
| 9.3.8 | Separation and positive segregation section redrafted to clarify when positive segregation is required. In addition, definitions of separation, segregation and positive segregation clarified. Schematic illustrations of when positive segregation is required added (six cases in all) as new Annex Q. |
| 9.3.8 | Clarification added on when thermal relief valves (TRVs) on tank inlet or outlet lines may/may not bypass to the storage tank. |

| Clause | Description of change |
|---|---|
| 9.5.1.6 | Requirements for verification of positive segregation effectiveness amended to at least every three months. |
| 10.1.6 | Redrafted to avoid duplication as ship-to-ship transfer and loading into floating storage are the same operation and to enable traceability to be retained during transfer between ships. |
| 10.2.3.3, 8.3.4.2 | Sampling requirements from multi-product pipeline aligned with single grade pipeline. 8.3.4.2 also changed to be consistent. Clarified that automatic continuous in-line monitoring acceptable. |
| 10.3.4 | Driver controlled loading section added. |
| 10.3.5 | Driver controlled delivery section added. |
| Annex A | Redrafted to differentiate between authorised signatories process for laboratory documents and operational documents with examples given of each. |
| Annex M | Concept of derogation introduced. |
| Annex N | New Annex N added covering fungible pipeline breakout/staging tankage (drain-dry). Numerous references to new Annex N added throughout text as applicable. |
| Annex O | New Annex O added covering aviation fuel cleanliness assessment by particle counting techniques. |
| Annex P | New Annex P added giving summary of routine test frequencies. |
| Annex Q | Example schematic illustrations added of aviation fuel supply chains and the requirements for segregation and positive segregation. |

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| | |
|---|---|
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# 1 INTRODUCTION, SCOPE, APPLICATION AND IMPORTANT DEFINITIONS

## 1.1 INTRODUCTION

For many decades those involved in aviation fuel manufacture and handling have worked to ensure that all aviation fuel delivered to airports is on-specification, clean and dry, and fit-for-purpose.

In various regions worldwide, this activity was undertaken by a relatively small number of integrated oil companies or national oil companies, working to company proprietary manuals. This situation has significantly changed in recent years, with a diverse range of companies and organisations having responsibility for aviation fuel manufacture and distribution to airports.

The need to highlight the availability of industry standards for the management of aviation fuel quality throughout the supply chain has been recognised by the International Civil Aviation Organization (ICAO), which has issued Doc 9977 *Manual on civil aviation jet fuel supply*. This has been issued to the civil aviation authorities of the 191 Member States of ICAO.

Industry stakeholders have recognised the need to document the key mandatory provisions that are considered essential for the maintenance of aviation fuel quality from its point of manufacture through (sometimes complex) distribution systems to airports. In addition, good practice recommendations and informative material have been provided, based on existing company operating procedures, and collective industry specialist knowledge developed over many years of safe and efficient operations.

The content of this publication is distilled from a large body of information to provide a supportable single standard for the manufacture, supply and distribution of aviation fuels. All companies/organisations involved in maintaining aviation fuel quality are encouraged to seek continuous improvement in their operations.

The overriding philosophy implicit in this document is that, at each step in the fuel's journey from refinery to airport, all the parties involved, from its initial production to subsequent storage and handling, have a shared responsibility for maintaining the quality, cleanliness and traceability of the fuel at that point in the supply chain, and should not expect the parties further downstream to remedy any deficiencies.

It should be noted that maintaining aviation fuel quality relies upon the involvement of competent and experienced practitioners. This publication has been prepared for use by such individuals.

## 1.2 SCOPE

This publication provides mandatory provisions and good practice recommendations for maintaining aviation fuel (jet fuel and aviation gasoline (avgas)) quality in refineries and in storage, distribution and transport systems including those delivering to airports, covering:

– facilities design and construction;
– product manufacture;

- batching;
- testing;
- release;
- storage and handling;
- receipt and discharge;
- quality assurance requirements, and
- operational procedures.

This publication does not address:

- The storage and handling of aviation fuels at airports. Requirements for airport installations can be found in:
  - ATA 103 *Standards for jet fuel quality control at airports.*
  - EI 1540 *Design, construction, commissioning, maintenance and testing of aviation fuelling facilities*.
  - JIG 1 *Aviation Fuel Quality Control & Operating Standards for into-plane fuelling services.*
  - JIG 2 *Aviation Fuel Quality Control & Operating Standards for airport depots and Hydrants*.
- Health, safety, environmental protection and supply continuity (which it is assumed companies/organisations have in place).

  Note: Requirements for overfill prevention (formerly covered by JIG 3), can be found in EI *Model code of safe practice Part 2: Design, construction and operation of distribution installations*.

## 1.3 APPLICATION

This publication is intended for adoption worldwide, by any company or organisation involved in the manufacturing, testing, blending or handling of aviation fuel upstream of airports. This includes those companies/organisations responsible for the design, construction, operation, inspection or maintenance of refineries, pipelines, marine vessels, coastal/inland waterway barges, road tankers, rail tank cars or storage installations, aviation fuel testing laboratories and inspection companies. This standard is intended to form part of a quality assurance framework that gives assurance of ongoing compliance with the provisions of this standard.

The requirements and recommendations detailed in this publication are in alignment with those in API *Recommended Practice* 1595 *Design, construction, operation, maintenance and inspection of aviation pre-airfield storage terminals* and API *Recommended Practice 1543 Documentation, monitoring and laboratory testing of aviation fuel during shipment from refinery to airport*.

For the purposes of demonstrating compliance with this publication the words 'shall', 'should' and 'may' are used to qualify certain requirements or actions. The specific meaning of these words is as follows:

- 'shall' is used when the provision is mandatory;
- 'should' is used when the provision is recommended as good practice, and
- 'may' is used where the provision is optional.

This publication cites numerous other publications (for a full list see Annex L). In each case it is the most recently published edition (the latest edition) of each referenced publication that applies.

Existing facilities may not initially comply fully with mandatory provisions of this publication. The goal should always be full compliance. Where full compliance has not been achieved, it shall be demonstrated that the combination of existing facilities and the quality assurance procedures applied to them (based on a full risk assessment) are capable of always meeting the objective of delivering only clean, dry, on-specification fuel. For further details on claiming conformance with EI/JIG 1530 and addressing non-compliance see Annex M.

It is also recognised that at times operational constraints may require short-term, one-off, deviations from normal operating procedures (in accordance with this standard). A waiver process shall be implemented by the organisation to manage this. Waivers shall be documented and include a description of additional actions taken to mitigate the risk for the duration of the waiver.

Any waiver process or system shall have defined levels of waiver authority.

From time to time there might be changes to the requirements in this standard between revisions. Any required changes will be communicated through formal addenda to EI/JIG 1530.

## 1.4 IMPORTANT DEFINITION

### 1.4.1 On specification

Aviation fuel specifications contain a table (or tables) of fuel property requirements, with their minimum and/or maximum allowable values. However, in addition to the table of properties, aviation fuel specifications contain numerous requirements related to permitted materials (both fuel components and additives), quality assurance, management of change, testing and documentation (traceability), and cleanliness, which are designed to ensure that fuel delivered into aircraft is fit-for-purpose.

**A declaration of 'on specification' or 'meeting the specification' means that the batch has been tested, in accordance with the prescribed methods and the results conform to all the various maximum/minimum limits for fuel property tests and also satisfy all other aspects of the latest version of the specification such as material composition, approved additives, quality assurance, management of change, cleanliness, traceability, etc.**

### 1.4.2 Glossary of terms and abbreviations

A glossary of terms and abbreviations used in this publication is included as Annex K.