EI 1589

Materials compatibility testing for aviation fuel filter elements and fuel sensing devices

energy institute

MATERIALS COMPATIBILITY TESTING FOR AVIATION FUEL FILTER ELEMENTS AND FUEL SENSING DEVICES

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FOREWORD

This publication has been prepared by the Energy Institute's Aviation Committee. It provides minimum compatibility test requirements for inclusion as part of first article qualification testing for equipment intended for use in aviation fuelling, including, but not limited to, aviation fuel filter elements, quantitative electronic sensors for particulate matter and/or free water content measurement and qualitative electronic bulk water detectors.

The minimum compatibility test requirements are intended for First Article Testing only. Such testing is intended to provide a means for manufacturers to demonstrate, under controlled laboratory conditions, the compatibility of their equipment with aviation fuels. These compatibility tests should in no way be taken as the only aspects of performance that a user should investigate prior to the routine use of equipment in their operations.

Any manufacturer wishing to offer equipment stated to comply with this publication is responsible for complying with all the mandatory provisions included herein.

Suggested revisions are invited and should be submitted to the Technical Department, Energy Institute, 61 New Cavendish Street, London, W1G 7AR (e: technical@energyinst.org).

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1 INTRODUCTION AND SCOPE

1.1 INTRODUCTION

The aviation fuel supply industry operates stringent quality control processes during fuel handling operations to ensure that all aviation fuel supplied to aircraft is within prescribed parameters of cleanliness and performance, in accordance with the relevant fuel specification. Fuel filtration is used extensively to maintain fuel cleanliness, with several different types of filtration system commonly adopted in supply chains and at airports. Each system relies on replaceable elements that are permanently fuel-wetted for extended periods of time (depending on filter type, up to several years). EI filter specifications have, historically, included the qualification requirement for compatibility testing of filter elements to confirm that the fuel will not have an adverse impact on the integrity of the filter and to confirm the filter will not have an adverse impact on fuel quality. Similarly, such requirements have also been included in EI 1598 *Design, functional requirements and laboratory testing protocols for electronic sensors to monitor free water and/or particulate matter in aviation fuel*, for electronic sensors. Those former requirements are consolidated and updated in this publication, which will be referenced by EI 1581, EI 1583, EI 1590, EI 1598 and EI 1599 as those titles are revised in the future.

This publication may form the basis of compatibility assessment for other items of equipment or components that are being considered for use in aviation fuel handling systems, as defined between purchasers and manufacturers.

It is the responsibility of a manufacturer to demonstrate to the purchaser that any components/ surfaces of equipment that will be in contact with the fuel when in service are compatible with fuel and will not have an adverse impact on fuel quality. As a minimum, compatibility testing in accordance with this publication shall be carried out.

Operators should also note the equipment/installation pre-conditioning prior to use (flushing and soak testing) requirements for aviation fuel handling systems that are provided by EI 1540 *Design, construction, commissioning, maintenance and testing of aviation fuelling facilities*, Annex C and EI/JIG Standard 1530 *Quality assurance requirements for the manufacture, storage and distribution of aviation fuels to airports*, Annex D.

1.2 SCOPE

This publication applies to:

- filter/coalescer elements (that are used in filter/water separators meeting the requirements of EI 1581);
- separator elements (that are used in filter/water separators meeting the requirements of EI 1581);
- filter monitor elements (that are used in filter monitor systems meeting the requirements of EI 1583);
- microfilter elements (that are used in microfilter systems meeting the requirements of EI 1590);
- dirt defence filter elements (that are used in dirt defence systems meeting the requirements of EI 1599);

– any non-metallic fuel-wetted components within a filter vessel (e.g. mounting seals, threaded-base adaptors, dummy filter monitor elements)[1];
– bonding materials for embedding of probes into fittings;
– fuel-wetted components of electronic bulk water detectors (that meet the requirements of EI 1592) and
– fuel-wetted components of electronic sensors to monitor free water and/or particulate matter (that meet the requirements of EI 1598).

The items listed above may be used in commercial/civilian or military fuelling applications, with jet fuel or aviation gasoline, that may contain approved additives. Excluded from the scope of this publication are internal protective coating systems that may be used in aviation fuel handling systems (e.g. for storage tanks, rail tank cars, road tankers, hydrant pipe, filter vessels and piping). For further information see EI 1541 *Requirements for internal protective coating systems used in aviation fuel handling systems*.

Note: it is also the intention for this publication to be referenced in a forthcoming EI specification for filtration systems that have one mounting stool: EI 1587.

1 Mounting seals and any associated bonding materials are required to be tested with the filter element to which they are applied.