EI Standard 1541

Requirements for internal protective coating systems used in aviation fuel handling systems

2nd edition

energy institute

EI STANDARD 1541

REQUIREMENTS FOR INTERNAL PROTECTIVE COATING SYSTEMS USED IN AVIATION FUEL HANDLING SYSTEMS

Second edition

October 2016

Published by
ENERGY INSTITUTE, LONDON
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Registered charity number 1097899

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The EI gratefully acknowledges the financial contributions towards the scientific and technical programme from the following companies

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BP Oil UK Ltd
Centrica
Chevron
CLH
ConocoPhillips Ltd
DCC Energy
DONG Energy
EDF Energy
ENGIE
ENI
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Tullow Oil
Valero
Vattenfall
Vitol
World Fuel Services

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ISBN 978 0 85293 945 1

Published by the Energy Institute

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FOREWORD

This publication has been prepared by the EI Aviation Committee. It is intended to provide guidance on performance requirements for protective coating systems that may be used in aviation fuel handling systems (e.g. storage tanks, rail tank cars, road tankers, hydrant pipe, filter vessels and piping).

This second edition replaces the first edition published in 2007 and has been prepared to incorporate the following changes:

- Expansion of the scope to reflect the wider application of the standard in aviation fuel handling systems (e.g. storage tanks, rail tank cars, road tankers, hydrant pipe, filter vessels and piping).
- Deletion of the reference to MIL-PRF-4556 which is obsolete.
- Clarification that Test Fluid B should be a jet fuel meeting either ASTM D1655 or DEF STAN 91-91, without CI/LI, FSII or SDA.
- Extension of the test protocol for Test Fluid C (synthetic seawater) to also include visual inspection after seven days of drying.
- The inclusion of requirements for more photographic records of testing.
- Clarification that a full penetration weld rather than arc welding should be used as part of the lining burn back test.
- The inclusion of an annex that provides a test fluid to assess the impact of a 50/50 blend of FSII/water on coating systems that will handle jet fuel containing FSII.
- The inclusion of an annex that provides information that may be of assistance for the assessment of existing coatings of unknown provenance.

Where coatings have been qualified to the requirements of EI 1541 1st edition and have demonstrated no harms in service, it may not be necessary for them to be requalified to the second edition of this publication (but, for example, see Annex B – the new requirements for testing with an FSII/water test fluid, intended only for coatings to be used in systems conveying fuel containing FSII). New coating system qualifications shall be in accordance with the requirements of this edition of this standard.

Users of this publication shall be aware that due consideration shall be given to the effect of any unusual or abnormal circumstance, on which it is not possible to generalise within the scope of this publication. Specialist advice shall be sought in these cases.

In addition, in some areas local or national statutory regulations also apply (e.g. German Institute of Building Technology requirement for tank coatings which result in a grey colour). This publication is intended to be complementary to these established controls and practices.

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Suggested revisions are invited and should be submitted to the

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ACKNOWLEDGEMENTS

The preparation of this publication was undertaken by Mr. J. Rhode (representing Air BP), with input from technical representatives of the following companies and organisations:

Air BP Limited
Air TOTAL International
Airlines for America
Compañía Logística de Hidrocarburos (CLH)
Chevron
ExxonMobil
ExxonMobil Research & Engineering
International Air Transport Association
Kuwait Petroleum International Aviation Company Ltd.
Phillips66
Shell Aviation
Shell Global Solutions
Vitol Aviation
World Fuel Services

A draft version of this publication was distributed to industry stakeholders for technical review. The following (in addition to representatives from the above companies/organisations) generously gave of their time to provide feedback, which is greatly appreciated:

Gavin Bagshaw (3M)
Jack Buffin (US Navy)
Terrence Dickerson (US Navy)
Jim Gammon (Gammon Technical Products)
Richmond Hannah (Aviation Refuelling Compliance Solutions P/L)
Guillermo Huarte (AXION Energy)
Martin Janssen (Department of National Defence, Government of Canada)
Chris Laing (US Navy)
Uwe Lauber (FAUDI Aviation GmbH)
Ron McDowell (PECOFacet)
Tom Muzik (ParkerVelcon)
Jay Patel (QinetiQ)
Pamela Serino (Defense Logistics Agency Energy)
Melanie Thom (Baere Aerospace Consulting, Inc)

Project coordination and editing was undertaken by Martin Hunnybun (EI).

1 INTRODUCTION AND SCOPE

1.1 INTRODUCTION

Protective coating systems are applied to interior metal[1] surfaces of jet fuel and aviation gasoline handling systems (including storage tanks, rail tank cars, road tankers, hydrant pipe, filter vessels and piping). Coating systems serve multiple functions including the prevention of corrosion on the metal surfaces, to ensure the integrity of containment as well as protecting aviation fuel from contamination by rust during storage and distribution. They also facilitate the removal of particulate contamination as their smooth surface helps the movement of contaminants to drain points. This may reduce the need for more frequent tank entry and cleaning, and also reduce the potential for microbial proliferation. Note: Coating systems that may trap water in their structure (e.g. certain types of glass fibre material) shall not be used as they negate the benefits of the coating, as described here.

There are many issues to consider when planning to use a protective coating system such as:

– determination of the effect of the coating on the aviation fuel;
– determination of the effect of aviation fuel on the coating;
– selection of the appropriate coating system;
– surface preparation;
– correct application, and
– curing and testing of applied coating systems.

1.2 SCOPE

This publication is intended to apply to:

– performance requirements for protective coating systems;
– coating manufacturer's test procedures, and
– coatings used in aviation fuel handling systems (e.g. storage tanks, rail tank cars, road tankers, hydrant pipe, filter vessels and piping).

1.3 RETROACTIVITY

The provisions of this standard are intended for application to new aviation fuel handling systems or existing systems that are undergoing coating repair or replacement.

[1] It should be noted that the use of stainless steel or aluminium may preclude the need for the use of a protective coating.