

*Alternative Fuels to 100LL Aviation Gasoline
Stakeholders' Workshop
National Research Council Canada
Ottawa
18th – 19th March 2014*

Def Stan 91-90 and EI 1542

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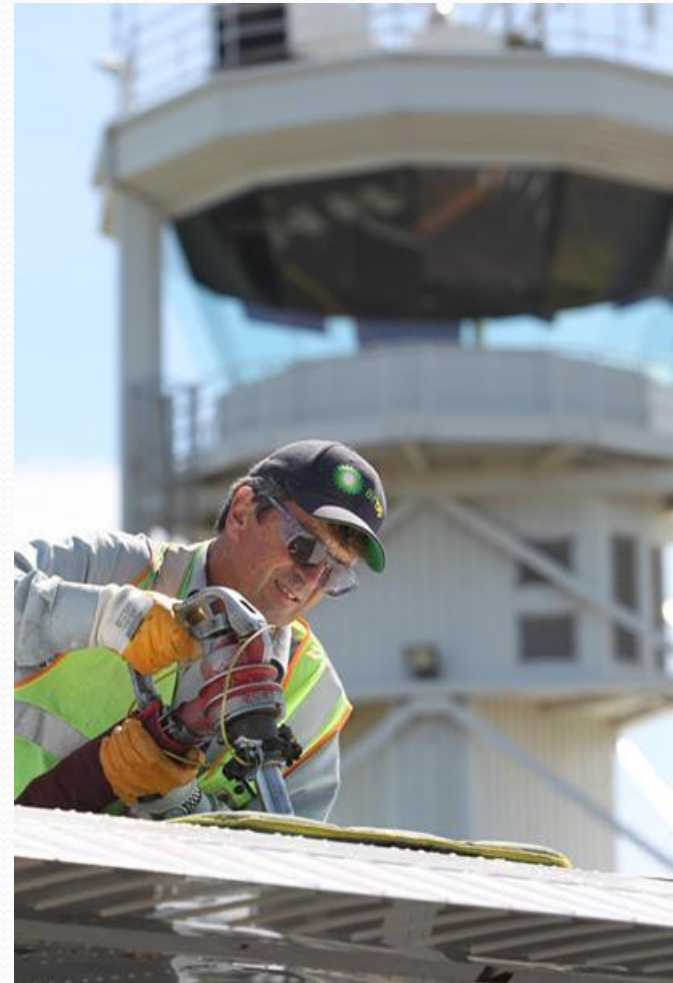
Agenda

- Defence Standard 91-90
- EI 1542
- Summary



Def Stan 91-90

- Defence Standard 91-90 Issue 3 remains current.
- Avgas Grade 100LL (0.56 gPb/litre max, 99.6 MON, 130.0 SC min) remains the primary grade in the world market.



Def Stan 91-90

- European Industry interest has been expressed for inclusion of an unleaded ≥ 91.0 MON Grade in Def Stan 91-90:
 - Complimentary to current Grades.
 - Colourless / MON ≥ 91.0 .
 - Known fleet compatibility/approval.
 - Product already in European market (ASTM D7547/Hjelmco 91/96UL™).
- Introduction important to bring Def Stan 91-90 up-to-date.

Def Stan 91-90

- Proposal for Def Stan 91-90 Issue 4:
 - Format as Issue 3
 - UL91 replaces Grade 80
 - gPb/l 0.013 maximum (ASTM D3237)
 - Other minor corrections / up-dates.
- Presented at AFC, London, 18th March 2014

Ministry of Defence
Defence Standard 91-90
Issue 4 Publication Date **day month year**

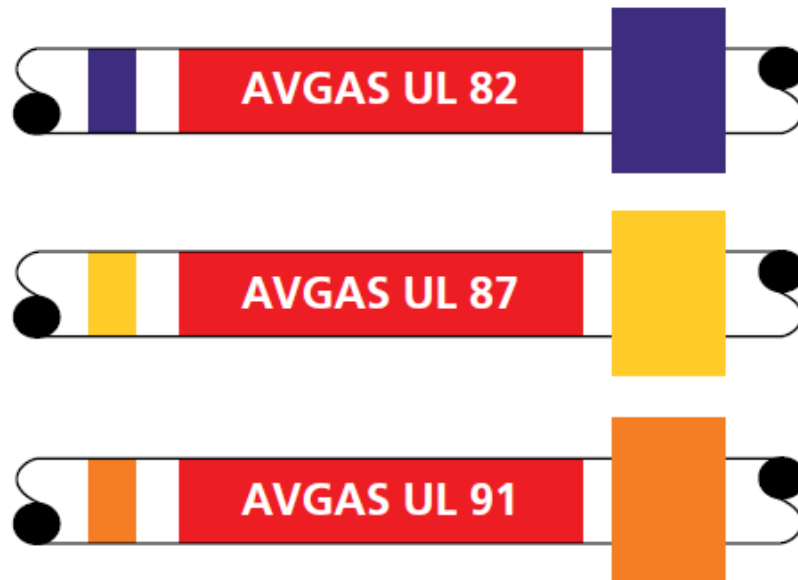
*This document is in draft form and for illustrative purposes only.
The document has been prepared specifically in support of the
Aviation Fuels Committee meeting 18th - 19th March 2014.*

Gasoline Aviation:
Grades **UL91, 100/130 AND 100/130LL**

Joint Service Designation:
AVGAS UL91, AVGAS 100 AND AVGAS 100LL

EI 1542

- Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fuelling Equipment.
- 9th Edition, published by Energy Institute, July 2012.
- Included unleaded Avgas Grades UL82, UL87 and UL91.



EI 1542

- Of the 3 Grades, UL91 represents best equivalency to Def Stan Grades.
- Importantly this permits read-across to aviation fuel handling procedures e.g.
 - EI 1550 Handbook on Equipment used for the Maintenance and Delivery of Clean Aviation Fuel.
 - EI 1583 Laboratory Tests and Minimum Performance Levels for Aviation Fuel Filter Monitors.
 - EN 1361 Rubber Hoses and Hose Assemblies for Aviation Fuel Handling – Specification.

Two meetings have been held to progress recommended practice EI 1597: Procedures for Overwing Fuelling to Ensure Delivery of the Correct Fuel Grade to an Aircraft.

- Currently this item is successfully managed by pilots/airfields.

Summary

- Unleaded Avgas has been available and successfully used in Europe for a number of years.
- Availability is increasing at the expense of 100LL and potentially, Mogas (EtOH content).
- The fuel is approved by major equipment manufacturers and EASA.
- The product is equivalent to 100LL except:
 - Mid-octane, MON \geq 91.0
 - \leq gPb/l 0.013
 - Colourless
- Understanding of aircraft octane requirement, known compatibility and HSE has eased introduction.
- Formal inclusion in Defence Standard 91-90 has been requested.

The European market now offers both 100LL and UL91, a positive move to the transition to unleaded Avgas.



Thank You