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Tech Talk: 0079

Material Limitations for Equipment in Contact with Aviation Fuels

It is well known in the industry that certain materials cannot be used in contact with jet fuels (i.e. zinc, copper etc.). It is less well understood where guidelines can be found, and the reasons why material restrictions are in place.

This Tech Talk will explain the various guidelines and standards in existence for aviation fuel handling systems. A summary of the industry bodies responsible for these guidelines (IP, API, JIG/IATA) can be found in Appendix A. It is important to note that any individual company specifications will take precedence.

Guidelines and standards about materials for jet fuel systems can be found in:

- API/IP SPECIFICATION 1584 (April 2001)
- JIG/IATA ISSUE (8 January 2001)
- ATA SPECIFICATION 103 (2006)
- CALTEX/BP Company Guidelines (and others)

In summary, all materials must be chemically compatible with aviation fuels and corrosion proofed (i.e. no plain steel). Galvanised steel and plastic materials may not be used for main system piping. Aviation fuels commonly contain additives to prevent corrosion, along with anti icing and anti static agents. Contact with certain metals can contaminate the fuel, and reduce the effectiveness of some additives. In addition, some additives may react to form poisonous compounds. Therefore, the following metals and their alloys CANNOT be used in contact with fuel:

- Copper
- Zinc
- Cadmium

However, according to API/IP 1584 “an aggregate amount [copper, zinc and cadmium] of 3% maximum may be present as alloying elements”. Also, subject to individual company specifications, small diameter copper pressure sensing or gauge lines may be used, provided that they are not in the main flow path of the product.



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APPENDIX A – INDUSTRY BODIES

API – American Petroleum Institute

Represents oil and gas industries in the US. As well as other publications the API has produced a number of industry standards and guidelines.

ATA – Air Transport Association

Represents the major US airlines. Its guidelines apply within the US only.

IP – Institute of Petroleum, London

Now known as the Energy Institute. The British equivalent of the API, which produces numerous publications and standards.

IATA – International Air Transport Association

An industry body representing the majority of the world's airlines. Has a number of working groups, the most relevant to us being the technical fuel group which ensures fuel quality.

JIG – Joint Inspection Group

The Joint Inspection Group is a working group within IATA. It is responsible for safety related inspections, and has produced a number of technical guidelines. JIG guidelines apply outside of the USA.