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Kathon[®] FP 1.5 - Fuel System Preservative Approvals Status

Kathon FP 1.5 fuel system biocide is designed to combat microbial contamination and related operational problems in refined fuel. Kathon FP 1.5 is registered with the EPA (Reg. # 707-198) as a fuel biocide, and is used very successfully worldwide. Through continuous testing with a large number of manufactures and organizations a wide-variety of approvals has been obtained or is pending.

This bulletin provides a summary of test results and current approval status. It will be updated as new test results and approvals become available.

DIESEL FUEL

A. Compatibility:

Kathon FP 1.5 biocide was evaluated for compatibility with Howell test diesel fuel at 6.5 times the recommended use levels. Results showed that Kathon FP 1.5 biocide did not significantly alter the base fuel with respect to 19 crucial properties. Treated fuel met all ASTM specifications.

B. Military Approvals and users:

United States' Military Approval: Kathon FP 1.5 biocide complies with the military specification MIL-S-53021A for diesel fuel and is included on the Qualified Products List.

French Navy S.E.C.L.F.: Fully tested and approved since 1987

RAF

Italian Navy

Australian Army

Czech Army

French Army

Dutch Ministry of Defense

Canadian Navy

Hungarian Army

Motoren Turbinen Union (Engine suppliers to German Navy)

C. Industrial & Marine Gas Turbine:

Kathon FP 1.5 biocide has been fully approved for use at recommended levels by the following gas turbine manufacturers:

Motoren Turbinen Union

Rolls Royce

General Electric

United Technologies Turbo Power

Siemens Power Corporation

JET FUEL & AVIATION EQUIPMENT

The approval process for additives in commercial and military aviation fuel is extremely rigorous. Kathon FP 1.5 biocide has already been successfully evaluated by a number of suppliers and users of aviation hardware, and testing continues worldwide.

A. Compatibility

1. Jet Fuel Study – ASTM 1655 and DERD 2494:

Compatibility with Jet A fuel was examined by Eastern Airlines Engineering Laboratories. Analysis indicated that fuel containing Kathon FP 1.5 biocide at 4 times the recommended level complies with the requirements of ASTM D1655 and DERD 2494. Kathon FP 1.5 biocide also complies with ASTM D4054, Part B and D975. Testing by S.E.C.L.F. showed no effect on fuel properties.

2. Filter Coalescers – Velcon:

Kathon FP 1.5 did not affect coalesced water drop size at four times the recommended use level. Soak tests in treated fuel did not reveal any deterioration of components. Testing was carried out by Velcon.

B. Airframe Fuel Systems :

Boeing Commercial Airplane Group tested fuel treated with Kathon FP 1.5 biocide at 4 times the recommended use level and found it to be compatible with the following airframe fuel system components.

1. Integral fuel tank coatings and substrates

7075- T6

4130 Steel

Titanium 6Al-4V – ASTM4967/MIL-T-9046

6 coatings

2. Elastomers

Fluorocarbon MIL-R-83248

Fluorosilicone MIL-R-25988

Buna N MIL-R-6855

Polyurethane BTC 86

Polyurethane BTC 69

Testing done by S.E.C.L.F. showed no effect on the elastomer properties

3. Sealants

PRO SEAL 890 Class A-2

PR 1440 Class A-2/B-2

C. Compatibility with Engines:

Rolls Royce conducted a thorough test of Kathon FP 1.5 biocide, focusing on the following parameters:

1. Hot end corrosion of super alloys
2. Fuel thermal stability
3. Solubility
4. Corrosion of fuel system components (cold)

- Results showed that Kathon FP 1.5 biocide “does not present a hazard to engine performance and integrity”. Rolls Royce concluded that Kathon FP 1.5 is “satisfactory for use.”
- Testing done by S.E.C.L.F. showed no effect on engine performance.

D. Airframe Approval Status:

1. Airframe Manufacturers

Boeing	Approved for use in all Boeing planes and all engine types 737,737-300/400/500, 737-600/700/800/900, 747-400, 757, 767, and 777
Dornier Luftfahrt GmbH	Fully approved.
British Aerospace	Approved for military aircraft.
McDonnell-Douglas	Approved for all McDonnell Douglas Heritage Airplanes. DC-8, DC-9, MD-80, MD-90, DC-10, MD-10, MD-11, and 717 Series
Airbus	Fully approved.
Fokker	Approved for F28 & F100.
Dassault	Approval Pending
Bell Helicopter	Approval Pending

2. Engine Manufacturers:

Rolls Royce	Approved for all civil aircraft engines. Approvals certified by the CAA. Approved for all turbine engines.
General Electric	Approved for all commercial aircraft engines. See GE Fuel Specification (D50TF2)
Pratt & Whitney	Approved for all JT3C, JT3D, JT4A, JT8D, JT9D, JT12/A/JFTD12A, PW2000, PW4000, F117-PW-100.
Pratt & Whitney Canada	Approved for all Turbo Fans JT15D engine models. PT6-3, 3B, 3D per 5144 Rev 14 dated May 2005. For additional engine models, see your Service Bulletin or Maintenance Manual for approval information.
SNECMA	Approved for all civil and military engines.
CFM International	No objection to use at 100 ppm.
Raytheon Aircraft Company (Honeywell)	Hawker aircraft equipped with Honeywell 731 series engines
Honeywell (RJ Engine Manufacturer)	Approved use concentration of 100ppm by weight for use on 146/RJ by BAE Systems Approved for turbine engines; turbofan, turboprop and turbo shaft.
Gulfstream	See Maintenance Manual, Chapter 12; Approved Fuel Additives
Turbomecca	Pending

3. Auxiliary Power Units (APU):

Allied-Signal	Fully approved.
P&W Canada	Approved for all Turbo Fans JT15D engine models
Garrett APF	Fully Approved
APIC	Fully approved for APS 2000 APU.

4. Airlines Approved use:

United Airlines
Continental
US Air
American Airlines
Southwest Airlines
Frontier Airlines
North American Airlines
UPS Air Cargo
Northwest Airlines
ATA Airlines

5. Military Aviation Approvals:

French Air Force
British Royal Air Force
Czech Republic Air Force

6. Other Pending Approvals:

British Airways
Armee de L' Air (France)

7. Filters

Velcon	Approved
Raycor	Pending
Faudi	Pending
Facet	Pending

E. Other Aviation Approvals:

IATA:

Kathon FP 1.5 is listed in the IATA Publication, "Guidance Material on Microbiological Contamination in Aircraft Tanks".

SUITABLE MATERIALS FOR CONTACT WITH KATHON FP 1.5 (as supplied):

Metals	Plastics	Elastomers	FRP / Coatings
Compatible: ⊕ 316L SS ⊕ Titanium ⊕ Hastalloy C276	Compatible: ⊕ HDPE ⊕ FI-HDPE ⊕ Ryton ⊕ Polypropylene ⊕ Teflon	Compatible: ⊕ Viton	Compatible: ⊕ Vinyl Ester (Plasite 4300) ⊕ Baked Epoxy (Plasite 9570) ⊕ Polyester Fumarate Resin (Atlac 382)
NOT Compatible: ⊕ Carbon Steel ⊕ 316 SS ⊕ 316 Ti-SS* ⊕ 304L SS ⊕ 304 SS	NOT Compatible: ⊕ PVC	NOT Compatible: ⊕ EDPM-Nordel ⊕ Butyl Rubber ⊕ Buna N ⊕ Buna S ⊕ Neoprene	NOT Compatible:

Compatibility determined at ambient temperatures up to 40°C.

* Titanium stabilized 316 can have variable metallurgy and some versions are not compatible with Kathon formulations.

Kathon FP 1.5 Compatibility with Fuel System Components

A. Additives

- Biocide Biobor JF
- Ethyl Antioxidant 33
- DuPont Antioxidant No. 23
- DuPont Antioxidant No. 31
- DuPont Metal Deactivator
- Antistatic Additive ASA-3
- Antistatic Additive STADIS 450
- Fuel System Icing Inhibitor (Ethylene Glycol Monomethyl Ether)
- Fuel System Icing Inhibitor (Diethylene Glycol Monomethyl Ether)
- Corrosion Inhibitor DuPont DCI-4A

B. Super Alloys

- After high temperature corrosion procedure
 - C1023
 - N 108
 - IN713LC
 - MarM 002 uncoated
 - MarM 002 Aluminized
 - SRR99
- | | |
|--|-----|
| Pure Silver | |
| Pure Copper | |
| Lead-Bronze with an indium diffusion coating | S31 |
| Aluminum Alloy –fresh exposed | |
| Aluminum Alloy – with anodized finish | |

C. Filters

- Velcon

D. Paint & Coatings

- PR 143
- PUIFT 823-707
- PR 1560
- Primers 5805-1103

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