



**Donaldson**  
*Filtration Solutions*

## **FILTERING HYDRAULIC MIST AND SPRAY FROM AIRCRAFT CABIN AIR**

Donaldson HEPA cabin air recirculation filters for MD-80 and other Boeing aircraft have tested 99.997 percent effective in filtering hydraulic mist and spray from air streams.

Donaldson began testing its cabin air filters several years ago against specific hydraulic fluids. In September 2000, the company published a Hydraulic Fluid Aerosol Removal Test Report. Eight Donaldson filter models were tested and maintained an aerosol removal efficiency of 99.996 percent or better on the hydraulic aerosol.

The report defined a test procedure developed by Donaldson engineers and presented the quantitative results of tests on Donaldson HEPA Aircraft Cabin Recirculation filters for MD-80, MD-90, DC-10, MD-11, Boeing® 737, 747, 757, 767 and 777 aircraft. The purpose of the test was to quantify the ability of an aircraft cabin air filter assembly to filter hydraulic mist and spray from the air stream. A popular fire resistant hydraulic fluid conforming to Boeing specification BMS 3-11 was used. Test results ranged from 99.996 percent to 99.999 percent removal.

In addition to aerosol particulate filtration, Donaldson manufactures activated carbon filters for cabin air recirculation systems. The carbon filters adsorb gas phase chemical contaminants, including components of hydraulic fluid.

Donaldson works closely with airlines and airframe manufacturers to develop filters that improve air quality inside airplanes. Testing against hydraulic fluid contamination is part of the company's commitment to the commercial aviation industry.

### **Hydraulic Mist Filtration Test Summary**

#### **Aerosol Efficiency Definition**

Aerosol Efficiency refers to the ability of a test filter to remove a mist or spray from an air stream.

#### **Boeing Hydraulic Mist Specifications**

- 777 - 3 hours at a hydraulic mist concentration of  $5.7 \times 10^{-5}$  g/ft<sup>3</sup>, achieve a required 99.9% efficiency
- 767-400 - 3 hours at a hydraulic mist concentration of  $1.02 \times 10^{-2}$  g/ft<sup>3</sup>, achieve a required 99.97% efficiency

## Test Setup & Procedure

- Stainless steel duct system to house inlet, recirculation filter, absolute and safety filters
- Each filter tested at rated flow

## Test Results

Filter	Hydraulic Mist Removal Efficiency
P196555 (737/757)	99.998%
P199762 (767-200)	99.999%
P199763 (767-300)	99.998%
P199764 (767-400)	99.998%
P199747 (747)	99.998%
P199777 (777)	99.998%
P199000 (MD-80, MD-90, DC-10, MD-11, 747 Classic)	99.997%
P199320 (A319, A320, A321)	99.996%

## Conclusion

Donaldson Cabin Air Recirculation filters removed hydraulic mist at efficiencies greater than 99.97% and approaching 99.999%

For more information, contact Donaldson Company at  
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