

# **ADVANCED POWER SYSTEMS INTERNATIONAL INC.**

558 Lime Rock Road  
Lakeville, CT 06039  
tel 860-435-2525 fax 860-435-2424  
Website – [www.fitchfuelcatalyst.com](http://www.fitchfuelcatalyst.com)

Technical Bulletin #7

## **ASTM Test Series of Low Sulphur DF-2 Treated by the Fitch Fuel Catalyst**

### **OBJECTIVE**

The objective of the experiment is to measure the impact of Fitch Fuel Catalyst on Low Sulfur DF-2. The ASTM test series selected included all tests employed for DF-2 sold for transportation use in the US, plus the additional tests listed in the DoD Policy Guidelines for Use of Aftermarket Fuel and Lubricant Additives. While the Fitch Catalyst is a permanent fuel treatment device and not an additive it is helpful to military customers to have the additional tests performed.

### **EXPERIMENTAL METHODS**

A 5 gallon sample of LS DF-2 was procured. 8.5 liters of this fuel was exposed to the In Line Fitch Fuel Catalyst in a lab scale circulating system designed to treat the fuel in a manner representative of the exposure the fuel would experience in an engine application. ASTM tests were performed on samples of the blank untreated fuel and the treated fuel exposed to the fuel catalyst.

### **FUEL PREPARATION**

A re-circulating system was constructed including a variable flow pump and flow meter. (Figure 1). The system was placed under a chemical hood. The system included a ball valve to allow removal of fuel samples of the treated fuel at the desired exposure time. The purpose of the system is to circulate fuel at a controlled and known rate through the fuel catalyst and return it to a reservoir in a manner similar to that in a fuel handling system on a vehicle or gen set.

Date of Treatment Wed May 10, 2006

Fitch Fuel Catalyst - Model Number F 300

8.5 liters of fuel in Pyrex / glass reservoir

Pump flow rate between 0.70 and 0.725 liters per minute. (1 complete turnover of fuel every 12 minutes.)

Start of circulation: 12:00 noon.

At 3 hours fuel was withdrawn from the system and the tests were performed on treated fuel and the untreated blank.

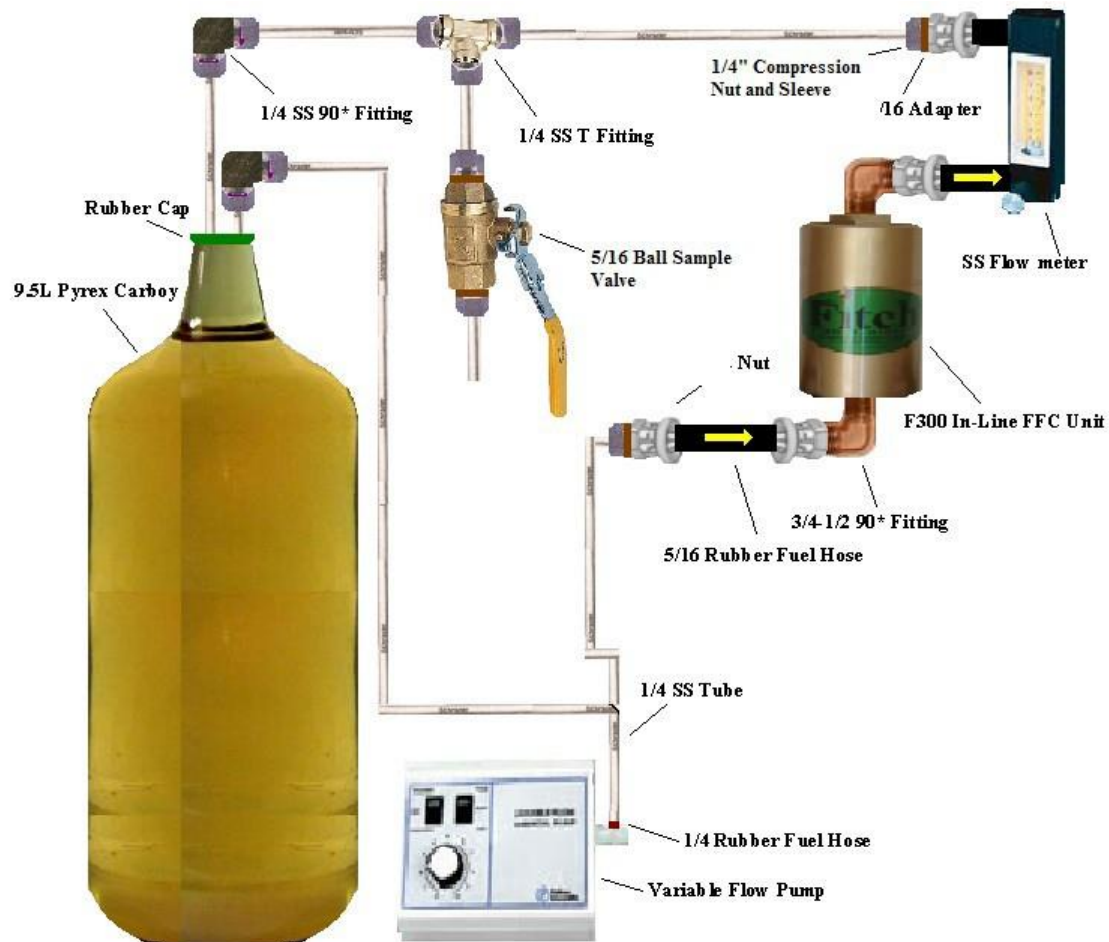


Figure 1  
Fuel - Fuel Catalyst Treatment Circulating System

## RESULTS



Date 05/26/06

Advanced Power Systems International, Inc  
558 Lime Rock Rd  
Lakeville, CT 06039

Re: Fitch Fuel Catalyst experiment - Low Sulfur Diesel Fuel DF-2

We have performed the series of ASTM tests required for transportation diesel fuel plus additional ASTM tests requested by APSI, on a sample of low sulfur diesel fuel LS DF-2. A portion of the fuel sample was exposed to a Fitch Fuel Catalyst at our laboratory in New Haven CT under our supervision. After exposure to the fuel catalyst, the ASTM tests were performed on the blank untreated fuel, and the treated fuel. Results are on the following page.

### Discussion of Results

Both the untreated and treated fuel are within specification and suitable for commercial use. The fuel treated by the fuel catalyst had superior characteristics compared to the untreated fuel in the following categories:

ASTM D5291 Ultimate Analysis Ratio of Hydrogen to Carbon  
ASTM D613 Cetane Number  
ASTM D6079 Lubricity  
ASTM D86 Distillation Points  
ASTM D6591 Polyaromatic Hydrocarbons

The fuel exposed to the Fitch Fuel Catalyst is preferable from the perspective of the consumer and would be our recommendation compared to the untreated fuel.

Syed N. Naqvi  
Laboratory Manager  
Intertek Caleb Brett  
New Haven CT  
06512 Ph: (203)  
467-3471  
Fax: (203) 467-8083