

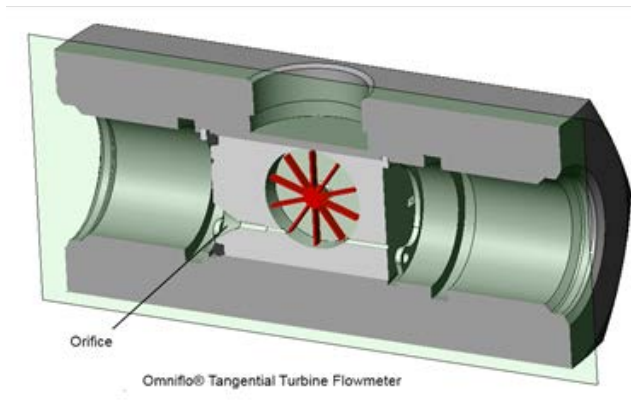


APPLICATION NOTE: Omniflo® Turbine Flow Meter Measures Low Flow Fluid in Military Flight Application

A major military contractor approached FTI Flow Technology, Inc., with a low flow application for use on a classified military aircraft.

The fluid being measured is Halocarbon 1.8, a low molecular weight polymer of chlorotrifluoroethylene (PCTFE). With a flow range of 0.003 to 0.16 GPM, the application represents a very low flow measurement application in a challenging environment of wide temperature swings having an effect on the fluid characteristics. The flow rate output provides feedback to the processing system to control valve positioning for extremely accurate low flow control for a critical system on the aircraft.

Flow Technology's Omniflo® turbine flow meter technology provides a proven platform for this type of application. Unlike an axial turbine flowmeter which must convert flow energy to an axial rotation, the tangential design utilizes a rotor perpendicular to the flow energy. Additionally, the transfer of flow energy is enhanced in this design through the use of an orifice to direct the flow to the perpendicular rotor blades. This causes the rotor to spin in proportion to the volumetric flow through the flowmeter. Sometimes referred to as a Pelton wheel or paddle wheel design, this design is generally considered to be the best solution for efficient conversion of flow energy.



Cutaway of Omniflo® Turbine Flow Meter

Advanced signal conditioning, which provides high-speed compensation for changes in fuel viscosity due to temperature changes and high-speed processing to enhance the linear response of the turbine meter, was also used. Available outputs include frequency, analog and digital on some platforms. The flow meter and electronics were modified in order to meet strict environmental and electrical flight qualification requirements.

HIGHLIGHTS

Industry: Aerospace
Service: Flow Rate
Fluid: Halocarbon 1.8

Application

Provide real time flow rate for feedback to control valve positioning

Problem

- Low flow, variable fluid characteristics
- Real time, accurate low flow rates are required in order to determine accurate fluid delivery
- Environmental conditions encountered during the flight envelope are severe

Solution

- FTI Omniflo® low flow turbine flow meter supplied with advanced high speed, temperature compensating electronics, housed in a flight optimized remote enclosure.