



TO10 – Thermal Oxidation Stability Test Rig

Methods:

ASTM D3241

IP323, ISO6249, JIS K2276

ASTM D1655, D7566,
D6615, D4054

DEF STAN 91-091



- ▶ 5th Generation of Jet Fuel Thermal Oxidation Tester
- ▶ Full compliance with ASTM D3241 and similar methods
- ▶ Unmatched operation simplicity and reliability
- ▶ Repeatable tight control of all operation parameters
- ▶ Enhanced quality control features
- ▶ Uncompromised safety
- ▶ Intelligent communication for optimal traceability
- ▶ DR10 – ITR tube deposit rater connectivity

The TO10 revolutionizes this routine thermal oxidation stability test of jet fuels by offering **outstanding ease of use and reliability of results**. This innovative instrument assures perfect control over sample flowrate, volume, and pressure, combined with unmatched precision of heater tube temperature profile active control making it **highly reproducible** test after test.

Smart design features simplify operator tasks: no tools are required to assemble the test section and a dedicated gauge allows for easy and precise tube positioning. The hydraulic system is designed **maintenance free**, without a need of regular solvent flush, reducing down-time and cost of ownership. Together with the fast cooling, the TO10 **improves drastically the lab productivity**. Innovative dual syringes pump **maintains uniform fuel flow** even with increased density samples, like SAF components.

The **referee** automatic tube rater ITR (DR10) can be linked to TO10 for direct transmission of deposit thickness profile. The test report provides **full traceability** of the test run (including the tube rating) without a need of extra accessories or specific tubes.

Applications

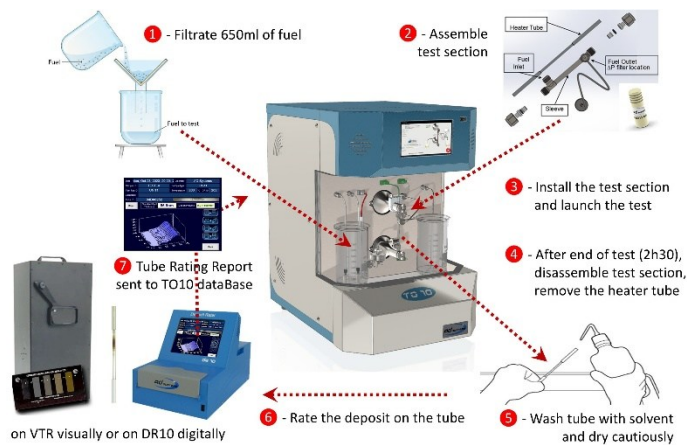
Thanks to its robustness, precision, and software flexibility, the TO10 is perfectly suited to any type of application, whether for certification and routine production control of aviation turbine fuels (civil and military), Synthetic Aviation Fuels and SAF components, or fuels research and development. Without modification the TO10 can be used as a Diesel Thermal Oxidation Testing (DTOT) for research to study the thermal stability of diesel or biodiesel.



POWERED by INNOVATION

Operation

Running a D3241 test with the TO10 is straightforward.



The entire test procedure is automated — the system self-check, fuel aeration with air humidity control, hydraulic system priming, regulation of temperature, pressure, flow, monitoring of ΔP , countdown remaining test time. All operating values are displayed and recorded throughout the duration of the test. Active cooling offers **quick cool down after test** time elapsed.

Reporting

The **comprehensive report** includes test conditions, the maximum ΔP value and its integral curve, tube deposit rating, as well as deposit 3D mapping when linked to DR10, ensuring full test traceability in a single operation. Test reports are stored in local database, can be printed, transmitted to LIMS or copied to USB.



Safety

The TO10 has **enhanced safety features**. The closed test compartment with VOC extraction system protects operators from exposure to fuel vapors. Double door and light indicator prevent the risk of burns. Automatic checks for beakers in place, thermocouple positioned, doors closed, absence of leak in test assembly, etc. — provide **smart assistance for trouble-free testing**.

Quality

The TO10 thermocouple is designed as self-contained measuring device with embedded non-volatile memory. It is delivered **factory calibrated, ready to use** at reception without a need of re-calibration. The TO10 allows lead free calibration by an external thermostatic bath. All calibrations are time tagged with validity reminders. Calibration history is included in the test report.

Benefits

The TO10 is **the most precise thermal oxidation instrument** available, **fully automated**, and **easy to use**. Direct communication with DR10-ITR deposit rater allows **full traceability for fuel certification**. The TO10 is perfectly suited to any type of routine application and for research purposes.

Technical specifications

Description

Test Methods	ASTM D3241, IP323, ISO 6249, JIS K2276 Up to 21 customized test methods Research methods for DTOT applications
Test Temperature	100°C – 380°C
Test Time	4 – 600 minutes
Operating Pressure	3.45 MPa (500 psi) $\pm 1\%$
Differential Pressure	0 – 750 mmHg (bypassed automatically at +250 mmHg)
Fuel Aeration	Air flow 1.5 L/min with automatic control Standard 6 min time or programmable
Air Flow Humidity	Efficient desiccant cartridge, easy access Automatic dryness control by humidity sensor, alert for the desiccant replacement
Fuel Flow	Std 3.0 ml/min $\pm 1\%$ or programmable Rugged dual syringe pump assures exceptionally stable fuel flow, no pulses or peaks Automatic priming and purge of fuel circuit
Thermocouple	Type K, class 1, 0 to 500°C range, Embedded calibration data, up to 5 points
Bus Bar Cooling	Heatpipe fluid technology + Peltier modules Each bus bar independently cooled and controlled to maintain consistent tube temperature profile test after test
Heater Tube Assembling	Dedicated gauge helps operator quickly and precisely installing the heater tube in the test section
Fuel Vapor Handling	Closed test compartment with sliding doors and fuel vapors extractor in standard
Results Storage	Built-in results database with storage at least 30 000 results; export to USB and LAN
DR10 – ITR Connectivity	Linked to DR10, metrological tube rating data automatically transferred, including 3D deposit mapping
LIMS connectivity	Ethernet TCP/IP ; Combined TO10 run & DR10 tube rating report can be transferred
Communication	USB (2), Ethernet (1)
Printing	USB graphic printer (optional)
Dimensions	440 x 600 x 670 mm (17" x 23" x 26")
Weight	Net: 60 kg (133 lbs)
Power supply	100/240 V – 50/60 Hz – 8 A
Operating Conditions	Temperature: from +20 to +30°C RH: 20% to 75% non-condensing

We reserve the right to alter specifications without notification

Your local distributor:

For additional information:

AD Systems

5 Allée de Cindais - 14320 Saint André sur Orne - France

+33 (0)2 31 75 02 68

sales@adsystems-sa.com

www.adsystems-sa.com

