

Quantum® Oxidation Tester

ASTM D2272, D2112, D4742, D942, IP229



Principle

Oxidation Stability: Test material, placed in a stainless steel pressure chamber, is exposed to oxygen at a specific test temperature and pressure. As the antioxidants are consumed, the sample reacts with the oxygen and the pressure drops.

History

Hot oil baths of varying sizes have long been used in the industry for running the Rotating Pressure Vessel Oxidation Test (RPVOT, formerly known as RBOT), the Thin-Film Oxygen Uptake test (TFOUT), and grease oxidation tests. These bath types expose the operator to hot oil fumes and odors, are prone to leak, need regular maintenance, and are generally messy and potentially hazardous to operate.

As laboratory facilities strive to improve their workplace conditions and encourage healthy environments, alternative approaches to running these tests are necessary.

Innovation

Tannas sets a higher standard by eliminating the hazards and mess of hot oil baths. The *Quantum*® Oxidation Tester is **the only non-liquid 'dry cylinder' heating system available** for running critical oxidation tests. Our technology is simple, clean, and efficient.

Features

- Non-liquid 'Dry-Cylinder' sample heating — eliminates hot, hazardous, liquid bath mess and odor.
- Advanced research capabilities for other applications with the Sample Temperature Probe and Sample Extraction Device.
- Front-loading, easily accessible pressure chamber.
- Small, bench-top footprint.

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RPVOT: Rotating Pressure Vessel Oxidation Test

ASTM D4742

TFOUT: Thin Film Oxygen Uptake Test

ASTM D942

Grease Oxidation Stability Test

Common Applications

- Steam Turbine Oils
- New & In-Service Oils
- Insulating Oils
- Gasoline Engine Oils
- Grease Oxidation Testing



- Simple venting of odors through tubing to scrubber or vent — does not require placement in hood.
- Rapid turn around in test capabilities due to independent sample testing — estimated to double productivity with multi-unit setup.

The software package for the *Quantum*® (with laptop) monitors and records up to four instruments at the same time or independently.



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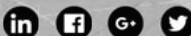
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RPVOT Test - ASTM D2272 & D2112

The Rotating Pressure Vessel Oxidation Test (RPVOT, formerly RBOT) uses an oxygen pressured vessel to evaluate the oxidation stability of new and in-service oils with water and a copper catalyst coil at 150°C for ASTM D2272 or 140°C for ASTM D2112.

An electrically heated, dry pressure chamber replaces the hot oil bath. The sample rotates axially at 100 RPM at an angle of 30° within the stationary pressure chamber by an internal magnetic drive motor.

The pressure chamber seals with a unique lid designed to fasten via three knurled thumb nuts. The *Quantum*® RPVOT enables testing proficiency due to independent sample analysis which increases productivity, especially with the multi-unit setup.



TFOUT Test - ASTM D4742

The Thin Film Oxidation Uptake Test (TFOUT) evaluates the oxidation stability of lubricating oils used in gasoline engine service. The test operates by reacting an oil/catalyst mixture at 160°C while pressurized with oxygen. The end-of-test is measured by the oxidation induction time resulting from the depletion of the antioxidant package. The TFOUT screens formulated oils prior to engine tests and is useful for quality control of oxidation stability of re-refined oils from batch to batch.

The primary adjustments to the *Quantum*® when performing the TFOUT test include a temperature setting of 160°C, a liquid TFOUT catalyst mixture in a small segmented dish, and a Chamber Volume Reducer.



Grease Oxidation - ASTM D942

The ASTM D942 test requires 20 grams of a grease in five glass dishes (4 grams each) to be stacked on a metal rack and oxidized in a pressure vessel heated to 99°C and filled with oxygen at 110 psi. The test continues for a selected period (100 to 500 hours) and the subsequent decrease in oxygen pressure, as a consequence of grease oxidation, is the test result.

The primary adjustments to the *Quantum*®, when performing ASTM D942, include a temperature of 99°C, grease filled glass dishes, a metal rack, and the use of a Chamber Volume Reducer.

The *Quantum*® Pivot Stand Assembly (right) includes the rotating rack system which pivots the testing chamber to a 90° vertical position per the ASTM D942 test method.



Parts & Accessories

ASTM D2272 & D2112 (RPVOT):

200853: RPVOT Sample Beaker
200651: Copper Catalyst Coils
200910: Magnetic Sample Cup w/ Spring Clip
200480: Magnetic Sample Cup Tester
200038: Sample Temperature Probe Assembly
200035: Sample Extraction Device Assembly
040028: QMR Reference Oil
040027: QHR Reference Oil

ASTM D4742 (TFOUT):

200104: TFOUT Conversion Package
200106: TFOUT Segmented Glass Dish
010047: TFOUT Catalyst A Package
010042: TFL-60 Reference Oil
010041: TFH-220 Reference Oil

ASTM D942 (Grease Oxidation):

200475: Grease Test Kit Assembly
200401: Grease Sample Dish

All applications:

200800: Software Package for *Quantum*[®]
200916: Oxygen Regulator
200914: Certified Reference Oxygen Gauge
040045: VarClean[®] Cleaner

Instrument Specifications

Dimensions	Bench-top: 20(w) x 38(d) x 33(h) cm (8 x 15 x 13 inches)
Weight	~9 kg (20 lbs.)
Voltage	120 VAC, 12 amp. Max 220-240 VAC, 7 amp. max.
Frequency	50/60 Hz
Heating Medium	'Dry Cylinder' heating system - no hot oil bath
Testing Capacity	Single position stainless steel pressure vessel Designed for multi-unit alignment, each independent
Test Parameter Capabilities	Temperature: 160° ± 0.1°C recommended max. Oxygen Charge: 100 ± 0.1 psi recommended max. Vessel Rotation: Variable speed control
Output	Continuous temperature & oxygen pressure readout - Digital USB to Laptop - Dsub9 to Analog strip-chart recording
Safety	Auto-Shutoff at end of test Current limiting fuses Over-pressure sensor & relief Over-temperature cutoff fuse CRN Approved & CE Marked
Shipping Weight & Dimensions	~26 kg (58 lbs.) approx. ~53 x 46 x 58 cm (21 x 18 x 23 inches) approx.

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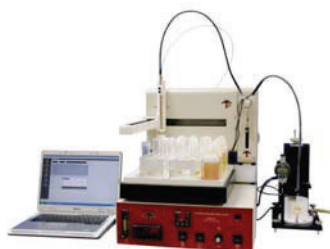
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Additional TANNAS CO. Precision Laboratory Instruments



Tannas Foam Air Bath (TFAB™)

- ASTM D892, D6082, IP146
- Non-liquid bath
- 24°C to 150°C range



Tannas Tapered Bearing Simulator (TBS™) Viscometer

- ASTM D4683, D6616, CEC L-036, IP370
- High-Temperature, High-Shear (HTHS) Viscosity



Tannas Noack S2 Volatility Test

- ASTM D5800, Evaporation Loss
- Phosphorus Volatility
- non-Wood's metal heating system



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