



"Tomorrow's Instruments... Today"™

TANNAS QUANTUM® OXIDATION TESTER

Oxidation Stability – RPVOT & TFOUT

- ASTM D 2272, IP 229, D 4742, – used with new & in-service oils, steam turbine oils, insulating oils and gasoline engine oils.
- Only non-Liquid RPVOT & TFOUT oxidation bath available
- New direct 'Dry-Cylinder' sample heating -- eliminates hot, hazardous, liquid bath mess and odor
- Rapid turn-around in test capabilities due to independent sample testing -- estimated to double productivity with multi-unit setup
- Very small, bench-top footprint
- Does not require placement in hood -- simple venting of odors through plastic tubing to scrubber or vent
- Automation Package (w/laptop), monitors & records up to four *Quantum* units at the same time or separately
- **Advanced research applications:**
 - Sample Temperature Probe
 - Sample Extraction Device



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

As laboratory facilities are under increasing scrutiny to improve working conditions and encourage healthy work environments, alternative approaches to running these tests are desirable.

In 2003, Tannas Co. set out to effectively eliminate the hazards and mess of hot oil baths and has recently completed the development of the Tannas *Quantum* Oxidation Tester, **the only non-liquid 'dry-cylinder' heating system available** for running these critical tests.



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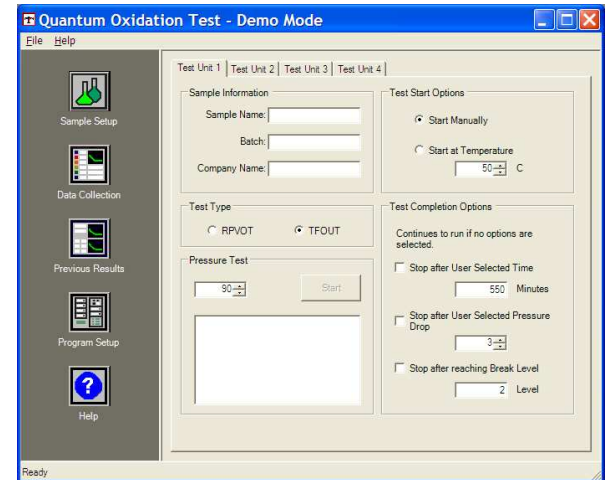
Agence Sud :
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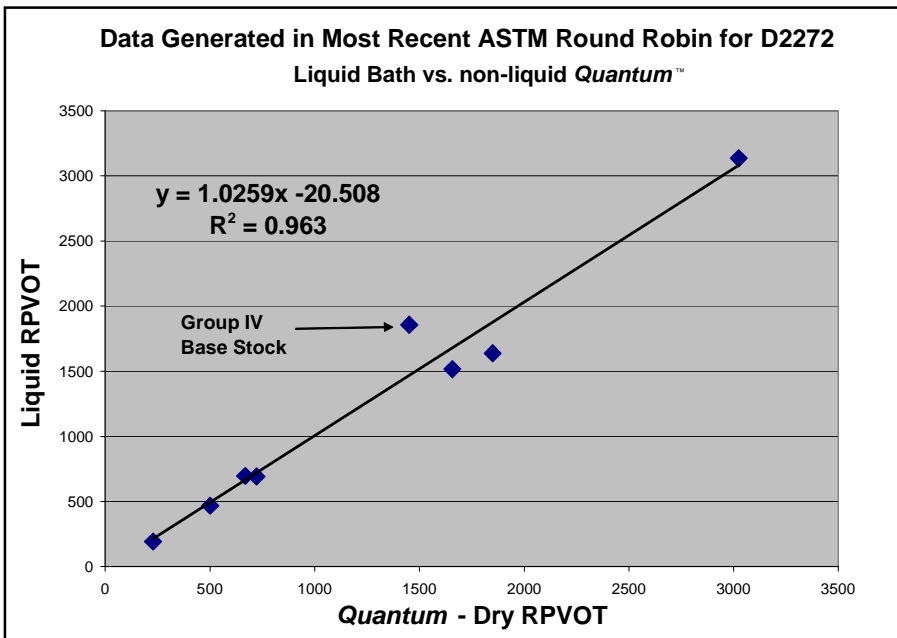
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Tannas *Quantum*[®] Oxidation Tester

Dimensions	Bench-top 8"(w) x 15"(d), x 13" (20 x 38 x 33 cm)
Weight	~20 lbs. (9 kg)
Voltage	120 VAC, 12 amp. max; 220 VAC, 7 amp. max Single Phase, 50/60 Hz
Heating Medium	'Dry-Cylinder' heating system - no hot oil bath
Testing Capacity	Single position stainless steel pressure vessel w/pressure transducer Designed for multi-unit alignment, each independent
Test Parameter Capabilities	Temperature: 200°C ±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 Cut-off Fuse CRN Approved & CE Marked



Data generated from the 2008 ASTM Round Robin shows very good correlation over a broad type and oxidative range of lubricating oils between the liquid bath and non-liquid *Quantum*[®] leading to the inclusion of the *Quantum*[®] RPVOT instrument into ASTM D2272.



The software package provides automated pressure and temperature monitoring and end point detection for up to four independent *Quantum*[®] units. End of test criteria can be selected by Time Duration, Pressure Drop or Break level. DAQ acquisition with USB interface to included laptop...
Many more features, call for details.



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Tannas *Quantum*® Oxidation Tester

RPVOT - Rotating Pressure Vessel Oxidation Test (*a.k.a.* **RBOT**)

Principle:

- A copper catalyst coil is immersed in the test oil and exposed to oxygen at moderate pressure and at a test temperature until the oxygen destroys the oxidation resistance of the test oil. At this point the pressure drops rapidly and shows the oxidation induction time or break point.

Special Features & Benefits:

- Non-liquid 'Dry Cylinder' sample heating approach eliminates hot, hazardous, liquid bath mess and odor.
- Does not require placement of instrument in a hood to control objectionable oxidized oil odors.
- Simple venting technique permits discharge of objectionable odors through plastic tubing to scrubber, or distant hood.
- Auto-Shutoff feature at end of test.
- Has comparatively very small, bench-top, footprint.
- Front-loading, easily accessible pressure chamber.
- Convenient, front mounted oxygen charge and release valves.
- Each unit is a "stand-alone" but can be grouped if desired via software package.
- Automation Package for the *Quantum* tester monitors & records up to four independent units.
- Rapid turn-around in test capabilities due to independent nature of each unit – estimated to at least double productivity with multi-rig setup.

NEW – *Sample Temperature Probe Assembly kit available for measuring the temperature of the sample during the test.*

NEW – *Extraction Device available for extracting small amount of sample periodically during the test for further analysis. (Also useful for injecting material into chamber during the test.)*

Significance:

- Used in evaluating the oxidation stability of new and in-service turbine oils having the same composition.
- Useful for assessing the remaining oxidation test life of in-service oils.

Heating Medium:

- Non-liquid 'Dry Cylinder' heating system – no hot oil bath.

Dimensions:

- Bench-top footprint: 8"w x 15"d x 12"h (20 x 38 x 30.5 cm), ~20 lbs. (9 kg)





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An ISO 9001 Certified Company

Voltage:

- 120 VAC, 12 amp. max (Also available in 220 VAC, 7 amp. max), Single Phase, 50/60 Hz.

Testing Capacity:

- Single position stainless steel oxidation vessel (meets 18-8, Sa304 requirements) with pressure transducer.
- Designed for multiple unit (side-by-side) alignment on the bench-top, each functioning independently.

Test Parameter Capabilities:

- Temperature – Choice of operating temperatures ($200 \pm 0.1^\circ\text{C}$ recommended maximum). Measured with 100 Ohm RTD accurate to 0.1°C .
- Oxygen Charge – Ranges from 0-200 psi (1379 kPa). Choice of pressures (100 ± 0.1 psi recommended maximum @ ambient). Overall system accuracy at 1.5% full scale including thermal error.
- Vessel Rotation – Variable speed control

Read-out:

- Temperature controller and pressure meter mounted on cabinet front for easy viewing of parameters throughout test – no separate console box.
- Continuous temperature and oxygen pressure output through Digital USB to Computer or Dsub9 connector to Analog chart recorder.
- Selectable graduations on recording device.

RPVOT Test Parameters (D2272):

- Operating Temperature: 150°C
- Oxygen Charge: 90 psi (620 kPa)
- Oxidation Vessel Rotation: 100 RPM
- Oxidation Vessel Angle: 30°
- Test Sample: $50 \pm 0.5\text{g}$
- Catalyst Components: Copper Wire Coil, Reagent Water

Safety:

- Oxidation vessel tested under pressures of 500 psig (3450 KPa) -- 300% of maximum test pressure
- CE Mark
- CRN No.: OH13309.5
- Current limiting fuses
- Over-pressure sensor & relief
- Over-temperature cut-out fuse

Test Methods/Specifications:

- ASTM D2272-09
- IP 229
- Currently being evaluated for inclusion in D2112

2012/2

Sample Temperature Probe Assembly



Sample Extraction Device

