

BALL-ON-CYLINDER LUBRICITY EVALUATOR (BOCLE)



Ball-on-Cylinder Lubricity Evaluator (BOCLE) TT-5001

Ball-on-Cylinder Lubricity Evaluator (BOCLE) TT-5001 complies with the ASTM D5001 Standard Test Method for Measurement of Lubricity of Aviation Turbine Fuels by the Ball-on-Cylinder Lubricity Evaluator (BOCLE).

The test involves placing the fluid under examination in a test reservoir, where atmospheric air is maintained at 10% relative humidity. A non-rotating steel ball, held in a vertically mounted chuck, is pressed against the outside diameter of an axially mounted cylindrical steel ring with a specified load. Meanwhile, the test ring is rotated at a constant speed, partially immersed in the fluid reservoir to keep it wet and ensure continuous transport of the test fluid to the ball/ring interface. The resulting wear scar on the test ball serves as a measure of the fluid's lubricating properties.

APPLICATIONS

The primary application of this evaluator is to measure the lubricity of aviation turbine fuels in compliance with the ASTM D5001 standard.

The test works by creating a wear scar on a steel ball under controlled conditions. The size of this wear scar is then measured to determine the lubricating properties of the fuel.

FEATURES

- Incorporates a PLC control system for fully automated operation.
- Utilizes semiconductor technology for both heating and cooling processes, ensuring quick cycle times and precise temperature control.

- Gas relative humidity adjustment is facilitated by a high-precision gas mass flow controller, offering rapid adjustment and minimal drift, thereby enhancing testing efficiency.
- Features touch screen operation for clear display and easy adjustment of all relevant parameters.
- Comes equipped with a microscope and camera system, using coaxial light illumination technology for binocular observation with a clear and bright field of view. The long focal length objective lens facilitates easy handling of steel balls, while an electronic micrometer accurately and swiftly measures the size of wear spots.
- Adopts standard assembly components to enhance test accuracy.

TECHNICAL SPECIFICATIONS

1. Fluid volume: 50 ± 1.0 ml
2. Fluid temperature: $25 \pm 1^\circ\text{C}$
3. Fluid pretreatment: Flowing at a rate of 0.5 L/min through the fluid and 3.3 L/min over the fluid for 15 minutes
4. Cylinder rotational speed: 0~240 rpm (with an error within 1 rpm when speed is at 240 rpm)
5. Maximum test force: 10 N
6. Applied load: 1000 g (500 g weight) (± 1 g)
7. Test force display error: $\pm 0.5\%$
8. Test force display repetitive error: $\pm 0.5\%$
9. Conditioned air: Relative humidity of $10\% \pm 0.2\%$ at $25 \pm 1^\circ\text{C}$
10. Test duration: 30 ± 0.1 minutes
11. Relative humidity: $10 \pm 0.2\%$



TORONTECH

Torontech Inc.

251 Consumers Road, Suite 1200
Toronto, Ontario, M2J 4R3, Canada 

Phone: +1 416 368 2721 | Fax: +1 416 981 7652
Email: info@torontech.com

Torontech, LLC

601 Brickell Key Drive, Suite 700
Miami, FL 33131, USA 

Toll-Free: 1-866-383-7919
Email: sales@torontech.com

Torontech ME FZE

Meydan Grandstand, 6th Floor,
Meydan Road, Nad Al Sheba,
Dubai-261440, UAE 

Phone: +971 488 19252
Email: me@torontech.com



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