

# SOUTHWEST RESEARCH INSTITUTE®

Fuels and Lubricants Research Division

## ASTM CE50S Pre-ignition Test

(ASTM D4858)

### Specifications

- NMMA TC-W3.

### Objective

- Evaluate the effect of a lubricant on pre-ignition caused by combustion chamber deposits.

### Field Service Simulated

- Typical two-stroke cycle air-cooled engines operated at full power.

### Test Fixture

- A Yamaha CE50S single-cylinder, air-cooled, two-stroke cycle, spark-ignition engine is coupled to a high-speed 10-hp dynamometer.
- External cooling air is supplied to the engine by a variable delivery fan.

### Test Parameters

- The test duration is 50 hours.
- The following steady-state conditions are maintained throughout the test:

Parameter	Value
Engine speed, rpm	4000
Load	WOT
Spark plug gasket temp, °C	200
Fuel/lubricant ratio	20:1

### Test Parts Evaluation

- General engine condition is evaluated.

### Used Lubricant Analysis

- None.

### Pass/Fail Criteria

- No more than one major pre-ignition, defined as a sudden increase in combustion chamber temperature of 10°C or greater, is allowed.



◆ We welcome your inquiries. For additional information, please contact:

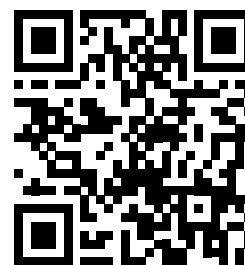
**Joseph Riou**  
Engineer  
210.522.6266  
[joseph.riou@swri.org](mailto:joseph.riou@swri.org)

Fuels and Lubricants Research Division

Southwest Research Institute  
6220 Culebra Road  
San Antonio, Texas 78238-5166



[swri.org](http://swri.org)  
[lubricanttesting.swri.org](http://lubricanttesting.swri.org)



Southwest Research Institute® is a premier independent, nonprofit research and development organization. With eleven technical divisions, we offer multidisciplinary services leveraging advanced science and applied technologies. Since 1947, we have provided solutions for some of the world's most challenging scientific and engineering problems.



Benefiting government, industry and the public through innovative science and technology

An Equal Employment Opportunity/Affirmative Action Employer • Race/Color/Religion/Sex/Sexual Orientation/Gender Identity/National Origin/Disabled/Veteran • Committed to Diversity in the Workplace

210.522.2122

[ask@swri.org](mailto:ask@swri.org)

Like. Share. Follow. Listen.



[swri.org](http://swri.org)

©2022 Southwest Research Institute.  
All rights reserved.