

# CALTEST INSTRUMENTS, INC.

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November 5, 2008

Mr Paul Jacobs, Chief  
Mobile Source Enforcement Branch  
California Air Resources Board  
P.O. Box 2815  
Sacramento, CA 95812

## DECLARATION OF COMPLIANCE WITH THE SAE J1667 SPECIFICATIONS

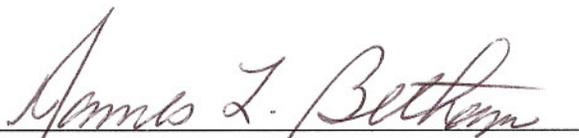
I, James L. Betham, represent CalTest Instruments, Inc. My title is Chief-Financial-Officer. I am authorized by CalTest Instruments, Inc., to provide this declaration. My company manufactures and markets in the State of California the following models of smokemeters:

- CalTest 1000            Full Flow
- CalTest 1000TR        Full Flow, measuring engine RPM & oil temperature

Each of these smokemeter models is in compliance with the specifications set forth in the Society of Automotive Engineers (SAE) J1667 recommended practice, issued in February 1996 and entitled "Snap-Acceleration Smoke Test Procedure for Heavy Duty Diesel Powered Vehicles". Compliance with these SAE J1667 specifications is disclosed to all current or potential purchasers or users of our smokemeters through my company's product literature and pages of smokemeter owner's manual, as attached hereto and incorporated herein by reference.

I declare under the penalty of perjury, under the laws of the State of California, that the foregoing is true and correct and if called upon to do so, I could and would competently testify thereto.

Executed this 17 day of NOVEMBER, 2008, at SANTA FE SPRING California.

Signed:   
James L. Betham, Chief-Financial-Officer

# CALIFORNIA ALL-PURPOSE CERTIFICATE OF ACKNOWLEDGMENT

State of California

County of Los Angeles

On 11-17-08 before me, NICK PONDOFF  
(Here insert name and title of the officer)

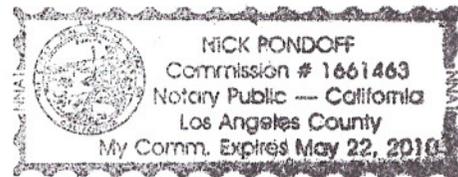
personally appeared JAME LEROY BETHAM

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Nick Pondoff, Notary Public  
Signature of Notary Public



(Notary Seal)

## ADDITIONAL OPTIONAL INFORMATION

### INSTRUCTIONS FOR COMPLETING THIS FORM

Any acknowledgment completed in California must contain verbiage exactly as appears above in the notary section or a separate acknowledgment form must be properly completed and attached to that document. The only exception is if a document is to be recorded outside of California. In such instances, any alternative acknowledgment verbiage as may be printed on such a document so long as the verbiage does not require the notary to do something that is illegal for a notary in California (i.e. certifying the authorized capacity of the signer). Please check the document carefully for proper notarial wording and attach this form if required.

- State and County information must be the State and County where the document signer(s) personally appeared before the notary public for acknowledgment.
- Date of notarization must be the date that the signer(s) personally appeared which must also be the same date the acknowledgment is completed.
- The notary public must print his or her name as it appears within his or her commission followed by a comma and then your title (notary public).
- Print the name(s) of document signer(s) who personally appear at the time of notarization.
- Indicate the correct singular or plural forms by crossing off incorrect forms (i.e. he/she/they, is /are ) or circling the correct forms. Failure to correctly indicate this information may lead to rejection of document recording.
- The notary seal impression must be clear and photographically reproducible. Impression must not cover text or lines. If seal impression smudges, re-seal if a sufficient area permits, otherwise complete a different acknowledgment form.
- Signature of the notary public must match the signature on file with the office of the county clerk.
  - ❖ Additional information is not required but could help to ensure this acknowledgment is not misused or attached to a different document.
  - ❖ Indicate title or type of attached document, number of pages and date.
  - ❖ Indicate the capacity claimed by the signer. If the claimed capacity is a corporate officer, indicate the title (i.e. CEO, CFO, Secretary).
- Securely attach this document to the signed document

### DESCRIPTION OF THE ATTACHED DOCUMENT

DECLARATION OF COMPLIANCE WITH  
THE SAE J-1667 SPECIFICATIONS  
(Title or description of attached document)

(Title or description of attached document continued)

Number of Pages 4 Document Date 11-17-08

(Additional information)

### CAPACITY CLAIMED BY THE SIGNER

- Individual (s)
- Corporate Officer  
CFO  
(Title)
- Partner(s)
- Attorney-in-Fact
- Trustee(s)
- Other \_\_\_\_\_

# 1 Introduction

The CalTest 1000 Smokemeter set is a diesel exhaust smoke opacity test system requiring only a few minutes to test an engine and print out opacity, density K, Test Averages and PASS or FAIL.

The smokemeter's state-of-the-art microprocessor & sophisticated software make it a good diagnostic tool. Maintenance managers can use the CalTest 1000 just-before & just-after maintenance actions to determine cost effectiveness of maintenance decisions. The clean-air-award-winning supervisor of the Antelope Valley Bus Company, Lancaster, California, has used CalTest smokemeters that way for years. He said: "I don't have to spend a lot of time training mechanics...The computer prompts the operator what to do at each step...My chance of receiving a citation for excessive smoke has been reduced to almost NIL!"

The CalTest 1000 meets or exceeds 1996 SAE J1667 specs & performed excellently in the SAE J1667 Committee's correlation testing of U.S.- & foreign-made smokemeters in California, April 1-4, 1996. By a wide margin, the CalTest 1000 was the fastest & most user-friendly of all smokemeters tested.

## Features

- **SAE J1667 snap-acceleration test procedure.** The 1996 SAE J1667 Recommended Practice provides an SAE J1667 Snap-Acceleration Test Procedure, plus smokemeter specifications. The CalTest 1000 has the SAE J1667 test procedure in its software. The LCD tells the operator what to do, step-by-step.

- **Three other snap-acceleration test procedures—for increased accuracy.** One drawback of the SAE J1667 snap procedure is that all three test snaps are averaged. A defective snap (the acceleration pedal was not depressed fully & rapidly, or was released too soon), causes testing inaccuracy. The CalTest 1000 software has three other more accurate snap procedures, with such "bad" readings unused. For example, 5, not 3, test snaps are done (adding only 40 seconds to test time). The "closest 3" are then identified by the microprocessor (after comparing the 6 possible combinations of 3 snaps) and averaged.

- **Under Load Testing.** The CalTest 1000 has a pre-programmed 20-Second Under Load Test for testing with a dynamometer or (using an optional sensor mount) while the vehicle is on the road. Also, in its Current Mode, the CalTest 1000 displays real-time opacity/density (A "curve"—continuous line—of the opacity can be recorded by an optional strip chart recorder.). If desired, the 1/2 second Bessel filter (used in all snap testing) can be turned off for such testing, so that *instantaneous* opacity/density is output.

- **Other Maintenance Manager or Smokemeter Operator options/inputs:**

- Calibration Check** 6.2.1 SAE J1667: Max. diff. from professional filter:  $\pm 2\%$ . Last check date on printouts.
- Post-Test Zero Shift Check** 5.4.3 SAE J1667: A five-second check at the end of a snap test. Max. shift:  $\pm 2\%$ .
- Ambient Air Conditions input** App.B SAE J1667: Press. & dry bulb temp. & rel. humidity or wet bulb temp.
- Max. permissible snap Test Average** Input an opacity or density specified by law or maintenance manager.
- Max. permissible test snap Range** For SAE J1667 test:  $\pm 5\%$ . For other tests, select  $\pm 3\%$  or  $\pm 5\%$  or OFF.
- Setting Date and Time.**
- LCD backlighting options** Backlighting provides full LCD display visibility under all lighting conditions.
- Selecting LCD display units** Opacity/density, inches/mm, HP/KW, making the CalTest 1000 a *worldwide* tester.
- Custom designing the contents of printouts**
  - Edit the 3-line printout heading
  - Select units on printouts For *worldwide preferences*: opacity only...density only...opacity and density.
  - Include/omit Ambient Air Corrections Optional corrections of snap test results for unusual air conditions.
  - Include/omit Post-Test Zero Shift Check This optional check can be added at the end of a snap test.
- PC Link** Output to the organization's PC software storing test data.

- **Beer-Lambert Alignment Chart** Step-by-step finding of "Standard" opacity when the exhaust is nonstandard. [The CalTest 1000 does it automatically]. Shows relationship between opacity, density and optical path length [exhaust diameter].

# 1 Introduction

The CalTest 1000TR Smokemeter set is a diesel exhaust smoke opacity test system for rapidly testing an engine and printing out opacity readings and overall test results.

The smokemeter's state-of-the-art microprocessor & sophisticated software make it a good diagnostic tool. Maintenance managers use the CalTest 1000TR just-before & just-after maintenance actions to determine cost effectiveness of maintenance decisions. The clean-air-award-winning supervisor of the Antelope Valley Bus Company, Lancaster, California, has used CalTest smokemeters that way for years. He said: "I don't have to spend a lot of time training mechanics...The computer prompts the operator what to do at each step...My chance of receiving a citation for excessive smoke has been reduced to almost NIL!"

The CalTest 1000TR meets or exceeds SAE J1667 (Feb96) specs. It performed superbly in SAE J1667 Committee's accuracy testing of 6 brands of U.S.- & foreign-made smokemeters in California, April 1-4, 1996. By a wide margin, the CalTest meter was the fastest & most user-friendly of all smokemeters tested.

## Features

- **SAE J1667 Snap-acceleration testing, Stall Testing, and Rolling-acceleration testing with RPMs and oil temperatures printed out for last three purge and all test readings.** No other brand of smokemeter does that.

- **Three other snap-acceleration test procedures—for increased accuracy.** One drawback of the SAE J1667 snap procedure is that all 3 test snaps are averaged. A defective snap (The accelerator was not depressed fully & rapidly, or was released too soon) causes testing inaccuracy. The CalTest 1000TR software has three other more accurate snap procedures, with such "bad" readings unused. For example, in C3of5 (closest 3 of 5), 5, not 3, test snaps are done (adding only 40 seconds to test time). The *microprocessor picks the "closest 3" (after comparing the 6 possible combinations of 3 snaps)* and averages them.

- **Last three "purge" snaps on print outs.** SAE J1667 specifies "at least three" purge snaps to clean out soot and ensure the engine is fully warmed. CalTest smokemeters (1) permit unlimited purge snaps, and (2) include the last three purge opacities on printouts. If a vehicle is cited for excessive smoke and the last three purge snaps were not close together, the printout would support a protest that testing was defective.

- **Under Load Testing.** The CalTest 1000TR has a pre-programmed 20-Second Under Load Test for testing with a dynamometer or (using an optional sensor mount) while the vehicle is on the road. Also, in its Current Mode, the CalTest 1000TR displays real-time opacity/density (A "curve"—continuous line—of the opacity can be recorded by an optional strip chart recorder.). If desired, the 1/2 second Bessel filter (used in all snap testing) can be turned off for such testing, so that *instantaneous* opacity/density is output.

- **Other Maintenance Manager or Smokemeter Operator options/inputs:**

- Calibration Check** 6.2.1 SAE J1667: Max. diff. from professional filter:  $\pm 2\%$ . Last check date on printouts.

- Post-Test Zero Shift Check** 5.4.4a SAE J1667: Sooting of optics during the test must not exceed 2% opacity.

- Ambient Air Conditions input** App.B SAE J1667: Press. & dry bulb temp. & rel. humidity or wet bulb temp.

- Max. permissible snap Test Average** Input an opacity or density specified by law or maintenance manager.

- Max. permissible test snap Range** For SAE J1667 test:  $\pm 5\%$ . For other tests, select  $\pm 3\%$  or  $\pm 5\%$  or OFF.

- Setting Date and Time.**

- Selecting LCD display units** (except tests with RPM/Temp option). Opacity/density, inches/mm, HP/KW.

- Custom designing the contents of printouts**

- Edit the 3-line printout heading** (Name of testing organization, meter operator, etc.)

- Select printouts units** (excepts tests w/ RPM/Temp option). Opacity, density or both.

- Include/omit Ambient Air Correction.** See page 13.

- Include/omit Post-Test Zero Shift Check** in the 3 "more snaps" tests. (Included in RPM/Temp tests)

- PC Link** Output to the organization's PC software storing test data.

- **Beer-Lambert Alignment Chart** Step-by-step finding of "Standard" opacity when the exhaust is nonstandard. [The CalTest 1000TR does it automatically]. Shows relationship between opacity, density and optical path length [exhaust diameter].