

**SAE** The Engineering Society  
For Advancing Mobility  
Land Sea Air and Space®  
**INTERNATIONAL**

400 Commonwealth Drive, Warrendale, PA 15096-0001

# SURFACE VEHICLE RECOMMENDED PRACTICE

**SAE** J1726

Issued 1995-12

Submitted for recognition as an American National Standard

## AIR-TO-AIR CHARGE AIR COOLER (CAC) INTERNAL CLEANLINESS

1. **Scope**—This SAE Recommended Practice outlines the acceptance criteria and procedure for determining CAC internal cleanliness as it applies to completed assemblies ready for engine air intake loop installation, be it a vehicular or stationary application.
2. **References**—There are no referenced publications specified herein.
3. **Acceptance Criteria**<sup>1</sup>—Completed CAC assemblies shall meet the following internal cleanliness criteria:
  - a. Maximum Weight of Debris = 25.0 mg (0.000882 oz)
  - b. Maximum Debris Particle Size = 3.175 mm (0.125 in)
  - c. Maximum Debris Particle Area = 2.58 mm<sup>2</sup> (0.004 in<sup>2</sup>)

Particles for dimensional analysis include sand, scale, cleaning shot, machining chips, weld spatter, slag, or particles not easily broken with a probe.

4. **Test Method**—The apparatus and procedure for determining CAC internal cleanliness is described as follows:

### 4.1 Apparatus

5.0 μ Qualitative Grade Filter Paper  
 0.5 μ Membrane Filter Paper  
 Filtering Assembly  
 Vacuum Filtering Flask  
 Beakers  
 Solvent, i.e., Hexane, n-Pentane, or Petroleum Ether<sup>2</sup>  
 Analytical Balance Sensitive to 0.1 mg  
 Drying Oven  
 Desiccator  
 Tweezers  
 Magnification Device with Scale

- 1 The final acceptance or rejection of CACs based on test results generated by and/or compared to this document should be mutually agreed upon by the manufacturer and customer.
- 2 These are highly volatile and flammable solvents and should be handled accordingly.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

## SAE J1726 Issued DEC95

**4.2 Procedure**

- a. All glassware and the test area used for determining CAC compliance with this document must be clean and free from debris.
- b. Filter the selected test solvent through a 0.5  $\mu$  membrane filter paper.
- c. Place a 5.0  $\mu$  qualitative grade filter paper in the drying oven at 100 °C (212 °F) for 15 min. Remove filter paper from drying oven and place in a desiccator to cool to 20 °C (68 °F). Remove filter paper from the desiccator and weigh it to the nearest 0.1 mg (0.0000035 oz) with an analytical balance. Record tare weight of filter paper.
- d. Lay the CAC horizontal on one of its faces. Pour a volume of filtered solvent equal to 40% of the total internal volume of the CAC into the CAC air inlet, and cap the air inlet and outlet portals.
- e. Tip the CAC back and forth in such a manner that the inlet and outlet tanks are alternately filled with solvent. Repeat the back and forth tipping for 10 cycles to insure that all the internal surfaces are flushed by the solvent. Tipping the CAC back and forth to fill each tank once is equal to 1 cycle.
- f. Drain the solvent from the air outlet portal of the CAC into a beaker. Filter the solvent through the previously prepared and weighed 5.0  $\mu$  filter paper, which has been set up in the vacuum filtering assembly.
- g. The spent filtrate can be used for future CAC testing after it has been filtered through a 0.5  $\mu$  filter paper.
- h. Remove the filter paper from the filtering assembly and place it in the drying oven at 100 °C (212 °F) for 15 min. Remove the filter paper from the drying oven and place it in a desiccator to cool to 20 °C (68 °F). Remove the filter paper from the desiccator and weigh it to the nearest 0.1 mg (0.0000035 oz) with an analytical balance.
- i. The dry weight of the filter paper with the debris residue minus the tare weight of the filter paper equals the debris weight. Compare the measured debris weight to the debris weight limit to determine if this requirement has been met.
- j. With the magnification device and its included optical scale, measure the maximum and minimum linear dimensions of the debris particles on the filter paper. Calculate the area of the debris particles. Compare the measured debris particle sizes to the debris size limit and compare the calculated debris particle areas to the debris particle area limit to determine if these requirements have been met.
- k. The report should include the following:
  - (1) Customer Part Number
  - (2) Manufacturer's Part Number
  - (3) Date of Manufacture
  - (4) Debris Weight and Particle Size Results

PREPARED BY THE SAE COOLING SYSTEMS STANDARDS COMMITTEE