

This Research Report is issued under the fixed designation RR: E34-1001. You agree not to reproduce or circulate or quote, in whole or part, this document outside of ASTM International Committee/Society activities, or submit it to any other organization or standards body (whether national, international or other) except with the approval of the Chairman of the Committee having jurisdiction and the written authorization of the President of the Society. If you do not agree to these conditions, please immediately destroy all copies of this document. *Copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. All rights reserved.*

1 May 2009

**Committee E34 on Occupational Health and Safety  
Subcommittee E34.50 on Health and Safety Standards for Metal  
Working Fluids**

**Research Report E34-1001**

**Interlaboratory Study to Establish Precision Statements for ASTM  
E2694-09, Standard Test Method for the Measurement of Adenosine  
Triphosphate in Water-Miscible Metalworking Fluids**

**Technical contact:**

Frederick Passman,  
B C A Inc  
3 CARLYLE CT  
PO Box 3659  
PRINCETON, NJ 08543  
US  
[fredp@biodeterioration-control.com](mailto:fredp@biodeterioration-control.com)

ASTM International  
100 Barr Harbor Drive  
West Conshohocken, PA 19428-2959

**1. Introduction:**

Interlaboratory Study 371 was conducted to establish a precision statement for E2694-09, Method for the Measurement of Adenosine Triphosphate in Water-Miscible Metalworking Fluids.

**2. Test Method:**

The Test Method used for this ILS is E2694-09. To obtain a copy of E2694-09, Method for the Measurement of Adenosine Triphosphate in Water-Miscible Metalworking Fluids, go to ASTM's website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service by phone at **610-832-9585** (8:30 a.m. - 4:30 p.m. Eastern U.S. Standard Time, Monday through Friday) or by email at [service@astm.org](mailto:service@astm.org).

**3. Participating Laboratories:**

The following laboratories participated in this interlaboratory study

1. Analyst 1 – Sarah Hallahan  
Caterpillar  
901 W. Washington Street, Bldg.  
MM2  
East Peoria, IL 61630-7650  
US

2. Analyst 2 – Brent Skinner  
Caterpillar  
901 W. Washington Street, Bldg.  
MM2  
East Peoria, IL 61630-7650  
US

**4. Description of Samples:**

There were 7 samples of varying targeted results used for this study. Each sample was collected, prepared and distributed by either Sarah Hallahan or Brent Skinner (Caterpillar Laboratory Technician). All samples were collected from individual machine sumps within the Caterpillar, East Peoria, IL facility. Below is a list of the systems from which weekly samples were collected:

1. EO-1 – Red Ring Shaver
2. EO-2 – Vertical Broach
3. S-1 – Gray Lathe
4. S-2 – Broach
5. SS-1 – Liebherr Hob
6. SS-2 – A-H Broach
7. SS-3 – Blanchard

**6. Interlaboratory Study Instructions**

Laboratory participants were emailed the test program instructions. For a copy of the instructions, please see Annex A.

**7. Description of Equipment/Apparatus<sup>1</sup>:**

For information on the equipment/apparatus used by each laboratory, please see Annex B.

**7. Data Report Forms:**

Each laboratory was provided with a data report form for the collection of data. A copy of the data is provided in Annex C.

Please note: The laboratories have been randomly coded and cannot be identified herein.

**8. Statistical Data Summary:**

A summary of the statistics calculated from the data returned by the participating laboratories is provided in Annex D.

**9. Precision and Bias Statement:**

9.1 The precision of this test method is based on an interlaboratory study of WK21264 - New Test Method for Determination of Adenosine Triphosphate (ATP) in Water-miscible Metalworking Fluids, conducted in 2008. Two laboratories participated in this study. Each of the labs was instructed to report triplicate test results for seven different materials, with measurements taken over five consecutive weeks. Every “test result” reported represents an individual determination. Except for the use of data from only two laboratories, Practice E691 was followed for the design and analysis of the data; the details are given in ASTM Research Report No. E34-1001.

9.1.1 *Repeatability limit (r)* - Two test results obtained within one laboratory shall be judged not equivalent if they differ by more than the “*r*” value for that material; “*r*” is the interval representing the critical difference between two test results for the same material, obtained by the same operator using the same equipment on the same day in the same laboratory.

9.1.1.1 Repeatability limits are listed in Table 1 below.

9.1.2 *Reproducibility limit (R)* - Two test results shall be judged not equivalent if they differ by more than the “*R*” value for that material; “*R*” is the interval representing the critical difference between two test results

---

<sup>1</sup> The equipment listed was used to develop a precision statement for E2694-09. This listing is not an endorsement or certification by ASTM International.  
Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.