1 November 2017

Committee A01 on Steel, Stainless Steel and Related Alloys
Subcommittee A01.06 on Steel Forgings and Billets

Research Report: A01-1005

Interlaboratory Study to Establish Precision Statements for ASTM A833-17, Test Method For Indentation Hardness of Metallic Materials by Comparison Hardness Testers

Technical contact:
John Griffin,
RERC Rectech, Univ of Alabama
501 BLDG- Room 102
1720 2nd Avenue South
Birmingham, AL 35294
USA
JAGRIF@UAB.EDU

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

1. Introduction:

Interlaboratory Study 1241 was conducted to establish a precision statement for A833, Test Method For Indentation Hardness of Metallic Materials by Comparison Hardness Testers.

2. Test Method:

The Test Method used for this ILS is A833. To obtain a copy of A833, go to ASTM's website, 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.

3. Participating Laboratories:

The following laboratories participated in this interlaboratory study:

Bradken Atlas-Technician 1 & 2
3021 South Wilkeson Street
Tacoma, WA 98409
USA
Stan Truselo
struselo@bradken.com

Citgo-Technician 1 & 2
135th Street & New Avenue
LEMONT IL 60439
USA
Jerry Wilks
gwilks@citgo.com

Emerson Process Management
301 South 1st Ave.
Emerson Innovation Center, Fisher Technology
Marshalltown, IA 50158-0190
USA
Jim Gossett
jimgossett2@gmail.com

Fabricated Pipe, Inc.
1010 Frank Oakes Rd
FERNWOOD MS 39635
USA
Brian Hanson
bhanson@fabricatedpipe.com

Howell Foundry L.L.C
PO Box 2487, 4084 US Hwy. 61
St. Francisville, LA 70775
USA
Zed Howell
zed@howellfoundry.com

IRISNDT / QA Department
5311 86 St NW
Edmonton, AB T6E 5T8
CA
Aaron Halvorson
ahalvorson@irisndt.com

ME Global
3901 University Ave NE
Minneapolis, MN 55421
USA
Ed Vesely
Evesely@meglobal.com

Pinson Valley Heat Treating Co.
PO Box 1299, 6179 Sunrise Dr
Pinson, AL 35126
USA
Benny Grissom
bgrissom@pvht.com

4. **Description of Samples:**

There was 1 sample used for this study. It was supplied, prepared and distributed by John Griffin of UAB. The sample tested was a Hardness Test Block Plate.

5. **Interlaboratory Study Instructions**
Laboratory participants were emailed the test program instructions. For a copy of the instructions, please see Annex A.

6. Description of Equipment/Apparatus[1]:
For information on the equipment/apparatus used by each laboratory, please see Annex A.

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 B.

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 C.

9. Precision and Bias Statement:

9.1 The precision of this test method is based on an interlaboratory study of A833, Standard Test Method for Indentation Hardness of Metallic Materials by Comparison Hardness Testers, conducted in 2015. Eight laboratories tested a single reference hardness block. Test results were reported as both individual determinations (12 from each participant) and as the calculated average of three determinations (4 from each participant). Practice E691 was followed for the design and analysis of the data; the details are given in ASTM Research Report No. A01-1005. [i]

9.1.1 Repeatability (r) - The difference between repetitive results obtained by the same operator in a given laboratory applying the same test method with the same apparatus under constant operating conditions on identical test material within short intervals of time would in the long run, in the normal and correct operation of the test method, exceed the following values only in one case in 20.

9.1.1.1 Repeatability can be interpreted as maximum difference between two results, obtained under repeatability conditions, that is accepted as plausible due to random causes under normal and correct operation of the test method.

9.1.1.2 Repeatability limits are listed in Tables 1 and 2 below.

9.1.2 Reproducibility (R) - The difference between two single and independent results obtained by different operators applying the same test

[1] The equipment listed was used to develop a precision statement for A833-17. This listing is not an endorsement or certification by ASTM International.