INSTRON®

Impact Calibration

Instron• ensures your pendulum impact tester provides accurate results.

Why Verify Your Impact Testing Machine?

When you use an impact tester to determine the breaking energy of specimens, you need to have confidence that the data is sound. An Instron calibration of your machine gives you a statement of how well your system is performing. Many testing methods are based on ASTM, EN or ISO standards that stipulate that the impact testing machine meets particular performance requirements and has current calibration certification to show proof of compliance. Instron impact calibrations are carried out against the appropriate international standard using traceable equipment and a fully trained and accredited calibration staff. Such calibrations provide a high integrity independent calibration report that fully meets ISO 9000 and ISO 17025 needs.

Instron Has Unsurpassed Capability

When choosing an impact verification provider, it is essential to determine if that provider has all the equipment necessary to fully assess the capability of your system. Impact testing machines come in many different shapes and sizes from many different manufacturers. Variations include: capacities from 1 Joule up to 750 Joules (35 ft-lbf to 550 ft-lbf); compound/'C'-shaped/'U'-shaped hammers; manual/automatic hammer lift; analog/digital scales; manual/automatic specimen insertion centering and software controlled versions with either local or remote console controls. Some providers' calibration equipment and methods may only be able to handle certain versions or capacities. Instron undertakes to cover all variations of machines,offering a design and manufacture service for any additional jigs or fixtures that may be required.

EXTRA INSTRON SERVICES

Impact Verification Certificate

The scope and uncertainties of any accredited calibration lab can be found on the accrediting agency's website.

Instron• certificates are designed to help you meet your quality program requirements. All of them include a unique certificate number and date of issue.

CERTIFICATE OF CALIBRATION

ISSUED BY: **INSTRON CALIBRATION LABORATORY**

DATE OF ISSUE: **21-Nov-05** CERTIFICATE NO: **19510204**

UKAS CALIBRATION

0019

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APPROVED SIGNATORY
D.J.Willmott

We verify many other brands in addition to Instron.

FOR: Instron Ltd

LOCATION: Coronation Road
High Wycombe
Bucks
HP12 3SY

MANUFACTURER: Instron/Wolpert

DESCRIPTION: Impact Testing Machine

Complete description of the machine eliminates all doubts about what has been verified.

MACHINE MODEL: PW30 **SERIAL NO:** 7300-H149

Striker Serial No: I613\2 **Anvil Serial No:** M.P.1506
Hammer Energy: 150 Joules

DATE OF VERIFICATION: 04-Nov-04

YEAR of MANUFACTURE: 1979

The scope of the verification is defined here.

SPECIFICATION: The above machine has been indirectly verified to BS EN 10045-2:1993 (based on the limited requirements of Section 6 only) using certified measuring & gauging equipment and certified reference specimens.

SUMMARY RESULT: The Charpy impact tester, for tests on metallic materials, satisfies the limited physical and dimensional requirements specified at Section 6.3 of BS EN 10045-2: 1993 over the range of 150 Joules Charpy

The results of these checks together with the results of the reference specimen tests are detailed on page 2 of this certificate.

The testing machine shall be re-verified annually, or before use if it has been dismantled for moving, or subjected to major repair or adjustment.

The reported expanded uncertainty is based on a standard uncertainty multipled by a coverage factor k = 2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Impact Verification Certificate

The certificate number is printed on every page for quick reference.

CERTIFICATE OF CALIBRATION

CERTIFICATE NUMBER

19510204

UKAS ACCREDITED CALIBRATION LABORATORY No. **0019**

VERIFICATION PROCEDURE: Instron procedure N201, Issue 1, includes inspection and dimensional checks on the frame, pendulum, anvils and striker in accordance with Section 6.3 of BS EN 10045-2: 1993. In addition, measurements were made to determine friction losses of the system. The results of these checks are detailed in the Results section below. The verification also involved the testing of two sets of reference specimens to cover the working range of the hammer. This data is also detailed in the Results section below.

Method of verification and conformance to relevant standards clearly stated so your auditors, customers and you have the information required.

Calibrated measuring instruments and gauges as shown below were used to effect the verification of the Charpy impact testing machine;

A detailed list of all the proving equipment used is always clearly stated. Note the number of items required to complete a full verification.

Description	Reference	Certificate No
Loadcell	N35-1K5	0157/031039
Force Dial Gauge	N46-10	0019/110575
Internal Micrometer	N46-1000L	0289/198677
Metric Feeler Gauges	N46-1L	0289/200467
Radius Gauges	N46-5R	0228/042397
Bevel Protractor	N46-ANGL1	0716/2078
Straight Edge	N46-EDGE1	198678
Gauge Setting Specimen	N46-GAUG1	0289/200470
Clinotronic	N46-INC	0373/61414
Setting Gauge 40 mm	N46-SET1	0289/200469
Half Specimen Gauge	N46-SET2	201230
Timer-Counter	P010795	0078/20803
Geometry Gauge	P32861	0289/200468
Nobel Readout	97-6460	0478/E04050315
Digital Dial Indicator	N5-100L	20040315A
Digital Caliper	4197009	20041101A
Thermometer	N9-T2	20040816A

CHECKS & INSPECTIONS:

ANVIL CHECKS	STATUS
1. Supports in same plane?	PASS
2. Supports horrizontal?	PASS
3. Anvil condition?	PASS
4. Anvils in same plane?	PASS
5. Anvil to Support angle	PASS
6. Anvil separation	PASS
7. Anvil radius	PASS
8. Anvil taper angle	PASS
9. Specimen centring device	YES
10. Specimen centring OK	PASS

STRIKER CHECK	STATUS
Striker Condition	PASS

FRICTION LOSSES	STATUS
Friction Loss Checks	PASS

Twelve specific checks and inspections are required for a full verification.

REFERENCE SPECIMEN BREAKING RESULTS:

Low Energy Specimens		High Energy Specimens	
Reference ID	Reading	Reference ID	Reading
A01	15.0	1-	33.0
A02	18.0	2-	32.0
A03	13.6	3-	31.8
A04	13.0	4-	34.0
A05	12.2	5-	31.6
Mean (J):	14.4	Mean (J):	32.5
Assigned value (J):	15.0	Assigned value (J):	30.0
Uncertainty - 95% (J	4.6	Uncertainty- 95% (J)	4.0
Error (J):	-0.6	Error (J):	2.5
Repeatability (J):	5.8	Repeatability (J):	2.4
Temperature (°C):	23.0		
Low Energy Status	**PASS**	High Energy Status	**PASS**

Data summary gives you a quick overview of the results.

CALIBRATOR: D Greaves/C Easden

Version: 20041103

The reported expanded uncerainty is based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements

Instron• Will Calibrate Your Tester to Meet Your Needs

There are four internationally recognized standard methods for verifying pendulum impact testing machines.

For Metals

Verifying Charpy pendulum impact testing machines used for testing metals:

- EN 10045-2: 'Charpy impact test on metallic materials – Method for the verification of impact testing machines'
- ASTM E 23: 'Standard test methods for notched bar impact testing of metallic materials'

For Non-metallic Materials

Verifying Izod and Charpy pendulum impact testing machines for non-metallic materials such as plastics or rubber:

- ISO 13802: 'Plastics - verification of pendulum impact testing machines - Charpy, Izod and tensile impact testing'
- ASTM D 256: 'Standard test methods for determining the Izod pendulum impact resistance of plastics'

The choice of standard has to suit the client's needs. As a general guideline, in North America, most users require verifications to the ASTM methods and, in Europe, generally require EN or ISO verifications. Instron can provide calibrations to the method that suits your needs.

Direct verifications of impact testers provide a check on the soundness of the basic mechanical and geometrical properties of the machine, including measurement of windage and friction losses. This verification is most important when the machine is first installed or when a major part is replaced, but should also be performed as part of the periodic re-calibration and certification.

Indirect verifications are performed using reference specimens that have been carefully characterized by qualified labs as reference specimens. Many test machine problems cannot be detected by a direct verification, so the indirect verification is an important additional check of the machine's performance. The energy levels recorded are assessed for accuracy and repeatability, along with estimated uncertainty of measurement levels. This gives a high level of assurance that the machine is recording the breaking energy levels of specimens accurately. Indirect verification is only available for metals. Indirect verification per ASTM E 23 is performed using reference specimens from NIST. The broken specimens are then sent to NIST for evaluation and a formal report.

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