INSTRON®

The difference is measurable®

ALIGNMENT TEST

Instron Professional Services

Instron Field Service and Calibration Engineers work directly with ASTM and Nadcap to understand the requirements for materials testing system alignment. We have developed and established alignment services complying with the guidelines and calculations detailed within ASTM E1012 and Nadcap standards.

WHY DO I NEED AN ALIGNMENT TEST?

The alignment of your testing system can change due to:

- Changing your grips
- Fitting new or replacement fixtures
- Repositioning the fixed crosshead
- Wear or damage to your fixtures or testing system components

Consequently, the importance of accurate alignment is being recognized by accreditation bodies and major aerospace corporations.

WHAT IS ALIGNMENT?

Alignment testing ensures that your test frame and grips are properly aligned. Accurate alignment ensures uniform stress in the specimen's test section, which is important when testing brittle and high modulus materials.

The easiest way to put unwanted stress into a test piece is to bend it and the easiest way to bend it is to misalign it initially and/or load it non-uniformly by:

- Application of an angular offset - C type bending
- Application of a concentricity offset - S type bending

Many testing standards specify alignment requirements in terms of percentage bending (e.g. less than 5% of nominal strain or of strain amplitude).

CALIBRATION CERTIFICATES

Instron calibration certificates provide you with the documentation necessary to prove compliance with industry testing standards and auditing authorities. A certificate documenting the required set of multiple test strain readings (including the percentage bending parameter) will be issued upon completion of the test.

Our certificates are quality-compliant and carry a unique certificate number and date.

The certificate contains a complete description of the equipment being tested.

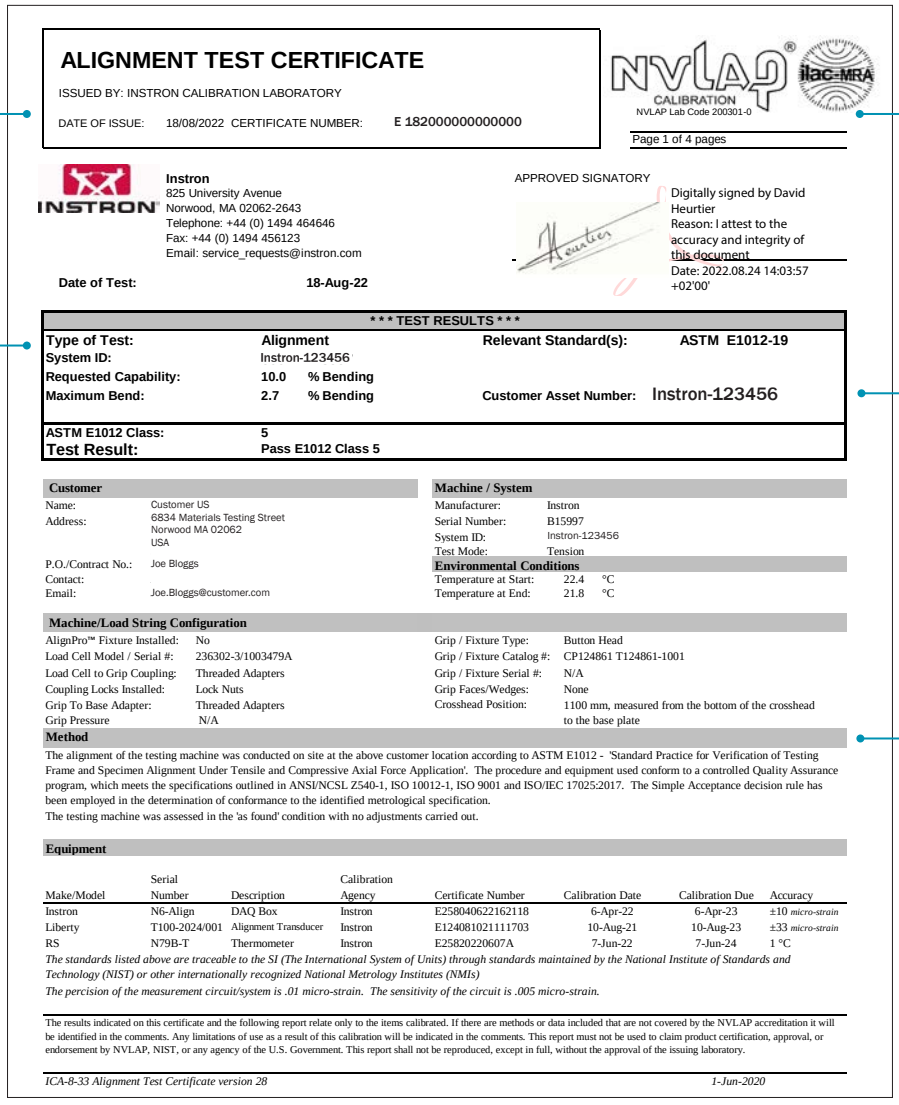
The summary table provides ease of understanding of calibration data.

NVLAP symbol and the Accredited Laboratory Combined ILAC MRA Mark provides international recognition and acceptance.

Scope of verification is always listed on the certificate.

Instron maintains 6 years of factory backup of calibration certificates.

Method of conformance to relevant quality standards clearly stated for risk reduction during audits and other regulatory evaluations.



ALIGNMENT TEST CERTIFICATE

ISSUED BY: INSTRON CALIBRATION LABORATORY

DATE OF ISSUE: 18/08/2022 CERTIFICATE NUMBER: E 182000000000000

NVLAP CALIBRATION NVLAP Lab Code 200301-0

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APPROVED SIGNATORY

Digitally signed by David Heurtier
Reason: I attest to the accuracy and integrity of this document
Date: 2022.08.24 14:03:57 +02'00'

Date of Test: 18-Aug-22

*** * * TEST RESULTS * * ***

Type of Test:	**Alignment**	**Relevant Standard(s):**	**ASTM E1012-19**
System ID:	**Instron-123456**		
Requested Capability:	**10.0 % Bending**		
Maximum Bend:	**2.7 % Bending**	**Customer Asset Number:**	**Instron-123456**
ASTM E1012 Class:	**5**		
Test Result:	**Pass E1012 Class 5**		

Customer

Name:	Customer US
Address:	6834 Materials Testing Street Norwood MA 02062 USA
P.O./Contract No.:	Joe Bloggs
Contact:	
Email:	Joe.Bloggs@customer.com

Machine / System

Manufacturer:	Instron
Serial Number:	B15997
System ID:	Instron-123456
Test Mode:	Tension

Environmental Conditions

Temperature at Start:	22.4	°C
Temperature at End:	21.8	°C

Machine/Load String Configuration

AlignPro™ Fixture Installed:	No	Grip / Fixture Type:	Button Head
Load Cell Model / Serial #:	236302-3/1003479A	Grip / Fixture Catalog #:	CP124861 T124861-1001
Load Cell to Grip Coupling:	Threaded Adapters	Grip / Fixture Serial #:	N/A
Coupling Locks Installed:	Lock Nuts	Grip Faces/Wedges:	None
Grip To Base Adapter:	Threaded Adapters	Crosshead Position:	1100 mm, measured from the bottom of the crosshead to the base plate
Grip Pressure	N/A		

Method

The alignment of the testing machine was conducted on site at the above customer location according to ASTM E1012 - 'Standard Practice for Verification of Testing Frame and Specimen Alignment Under Tensile and Compressive Axial Force Application'. The procedure and equipment used conform to a controlled Quality Assurance program, which meets the specifications outlined in ANSI/NCSL Z540-1, ISO 10012-1, ISO 9001 and ISO/IEC 17025:2017. The Simple Acceptance decision rule has been employed in the determination of conformance to the identified metrological specification.
The testing machine was assessed in the 'as found' condition with no adjustments carried out.

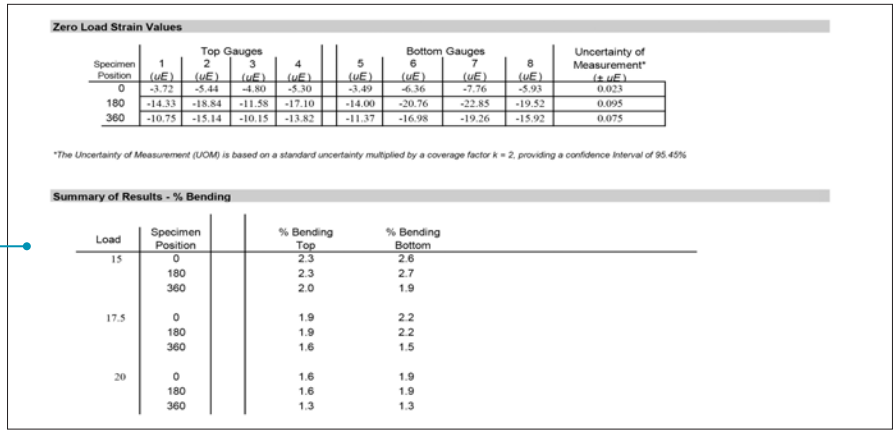
Equipment

Make/Model	Serial Number	Description	Calibration Agency	Certificate Number	Calibration Date	Calibration Due	Accuracy
Instron	N6-Align	DAQ Box	Instron	E258040622162118	6-Apr-22	6-Apr-23	±10 *micro-strain*
Liberty	T100-2024/001	Alignment Transducer	Instron	E124081021111703	10-Aug-21	10-Aug-23	±33 *micro-strain*
RS	N79B-T	Thermometer	Instron	E25820220607A	7-Jun-22	7-Jun-24	1 °C

The standards listed above are traceable to the SI (The International System of Units) through standards maintained by the National Institute of Standards and Technology (NIST) or other internationally recognized National Metrology Institutes (NMIs)
The percision of the measurement circuit/system is .01 micro-strain. The sensitivity of the circuit is .005 micro-strain.

The results indicated on this certificate and the following report relate only to the items calibrated. If there are methods or data included that are not covered by the NVLAP accreditation it will be identified in the comments. Any limitations of use as a result of this calibration will be indicated in the comments. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government. This report shall not be reproduced, except in full, without the approval of the issuing laboratory.

ICA-8-33 Alignment Test Certificate version 28 *1-Jun-2020*



Zero Load Strain Values

Specimen Position	Top Gauges 1 (με)	2 (με)	3 (με)	4 (με)	Bottom Gauges 5 (με)	6 (με)	7 (με)	8 (με)	Uncertainty of Measurement* (± με)
0	-3.72	-5.44	-4.80	-5.30	-3.49	-6.36	-7.76	-5.93	0.023
180	-14.33	-18.84	-11.58	-17.10	-14.00	-20.76	-22.85	-19.52	0.095
360	-10.75	-15.14	-10.15	-13.82	-11.37	-16.98	-19.26	-15.92	0.075

**The Uncertainty of Measurement (UOM) is based on a standard uncertainty multiplied by a coverage factor k = 2, providing a confidence Interval of 95.45%*

Summary of Results - % Bending

Load	Specimen Position	% Bending Top	% Bending Bottom
15	0	2.3	2.6
	180	2.3	2.7
	360	2.0	1.9
17.5	0	1.9	2.2
	180	1.9	2.2
	360	1.6	1.5
20	0	1.6	1.9
	180	1.6	1.9
	360	1.3	1.3

ALIGNMENT STANDARDS

We offer a wide range of alignment test services conforming to the requirements of:

Nadcap AC7122

- Criteria for non-metallic materials.

Nadcap AC7101

- General requirements for Material Testing Laboratories and audit criteria for mechanical testing.

ASTM E1012

- Requirements and calculations for assessing test frame and specimen alignment.

These alignment standards are for materials testing systems and address a comprehensive range of applications including metals, plastics, composites, coatings and bonding.

Whether your test laboratory is engaged in raw material manufacturing, component manufacturing, or independent testing services, Instron can provide you with the support, services, and application expertise needed to help you address the alignment requirements for your business.

ALIGNMENT TEST SERVICE

Our alignment test service will be carried out at your facility, following an evaluation of requirements by an Instron Alignment Expert. The evaluation includes a review of the alignment criteria for your testing system's application and the alignment specimen that is representative of your test material.

If required, Instron can provide or manufacture the required representative strain gauged alignment specimen.

BENEFITS OF INSTRON CALIBRATION AND TEST SERVICES

Instron is accredited by NVLAP under Lab Code 200301-0. This ensures that Instron has proven technical competence and has the necessary quality systems in place to ensure consistent calibration and assessment processes which maximize customer confidence.

- All global calibration laboratory procedures follow the latest versions of ISO or ASTM calibration standards.
- Instron has highly accurate calibration equipment to provide alignment tests to meet ASTM and Nadcap standards.
- All Field Service Engineers use our Calpro CR software, which has been developed and validated to ensure compliance with calibration standards and eliminate common data transfer errors.
- Our calibration kits are carefully monitored and re-certified by our global calibration laboratory to ensure the integrity of your data.
- All Instron accredited certificates of calibration contain the NVLAP Symbol and Accredited Laboratory Combined ILAC MRA Mark, an internationally recognized "stamp of approval" that demonstrates compliance against agreed standards and requirements.

WHAT IF MY TESTING SYSTEM'S ALIGNMENT IS NOT COMPLIANT WITH NADCAP?

Should your testing system's alignment not follow Nadcap, we can work with you to develop a corrective action plan to achieve the required level of accuracy.

Adjustment and/or Instron's AlignPRO™ Alignment Fixture combined with our alignment assessment procedures can often bring a non-compliant system into alignment compliance.

ACCESS YOUR CALIBRATION CERTIFICATES WITH INSTRON CONNECT

Instron Connect includes a number of technologies that create a secure connection between the testing systems at your facility and Instron. These technologies include a support portal and an AI driven mobile app where you can access your Instron system's calibration certificates and service history any time.

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