

## Measurement Solutions

### Introduction

The document that follows is a guide for NOSHOK's new calibration certificate. Calibration certificates are technical documents that convey copious amounts of information and detail. This guide is intended help readers contextualize some of the features and functions of our new calibration certificate. NOSHOK's reasons for developing a new calibration certificate occur naturally.

The primary goal was to set an engineered and architected foundation for our growing certified calibration program. In doing so, the new document harmonizes several disparate calibration certificates and processes currently used in our production facility. This greatly improves our efficiency and reduces opportunities for human error. Additionally, we wanted our new calibration certificate to function for more things than just mechanical pressure gauges. This new document will be the foundation for all certified calibration activities at NOSHOK in the future. Lastly, we wanted to build a document that would function better for end users. Calibration certificates are an essential part of some customer's business activities and we wanted ours to stand out as one of the best.

In broad strokes, NOSHOK's new calibration certificate manifests an engineered approach to everything about the certificate document. Rather than simply codifying all necessary information in one place, in a single document, the new calibration certificate carefully arranges all of the necessary information in a format that facilitates the documents use and function. As such, the new certificate is intentionally a multipage document. This allows for much better overall organization and easier consumption of all the metadata of a certified calibration. Calibration certificates are technical documents built for the capture and conveyance of calibration activities and metadata. Indeed, the new document can handle the reporting duties of most of our calibration activities. NOSHOK's new multipage format is optimized for clarity over brevity.

### Foundation Guidelines

As a start to evaluate NOSHOK's new calibration certificate, it is helpful to know that we consider a certified calibration to be a "data collection event". Furthermore, a single unit under test can have many separate data collection events over its lifespan.

In this context, the value of a multipage document format becomes more evident. Take for example a pressure gauge with a maximum indicating pointer. A complete certified calibration of this device would

best include two calibration data sets with the maximum indicating pointer engaged and disengaged. Both of these operating conditions abide different accuracy statements and therefore should be tested. If the data sets include increasing and decreasing test points (repeatability and hysteresis), multiple pages quickly become valuable. A similar scenario can be highlighted for units under test being recalibrated with as received and as left data sets.

Certified calibration events must be traceable. As such, unique identifiers become a very important necessity of calibration activities. Within the framework of a NOSHOK certified calibration, there are two unique identifiers that users will encounter and they are related. The first is the unique identifier of the device or unit under test. If the device is built new after the release date of the new calibration certificate, the unique identifier will be automatically generated for the device and is a derivative of NOSHOK's sales order number. Devices with pre-existing unique identifiers will continue to use their pre-existing identifiers.

The second unique identifier that users will encounter is the certificate number. This is the unique identifier that identifies a particular certified calibration document (and by proxy, a particular collection of data collection events for a particular unit under test). The format for the certificate number is as follows:

Unit Under Test Unique Identifier-YYYYMMDD-HHMMSS

By using the unit under test unique identifier plus a concatenated date string, easy management of calibration certificates over time can be achieved. With this format, searching for certificate documents by device ID and date/time for both end users and NOSHOK becomes easy. Additionally, this number format has enough depth to uniquely identify calibration events as fast as we can produce them.

Lastly, it is noteworthy that NOSHOK uniquely identifies a customer order for a certified calibration with a certificate number. We do not uniquely identify each individual data collection event within a customer order (for the same unit under test). Using the above example of a pressure gauge with a maximum indicating pointer, both data collection events will reside on the same calibration certificate and that document will be assigned a single certificate number.

The sections that follow are an overview description of the new calibration certificate and the format of the information contained within.

## Document Overview

All pages of the new calibration certificate include a header and footer. Here the user will find overall document information. Page one header includes NOSHOK's business information and the document title. All subsequent headers include certificate number and the certification date. With this information, users can be assured that all pages of the document in hand do indeed belong together as a collection under the one certificate number. The footers of all pages include the calibration certificate document number (NOSHOK's internal document number) and page numbers.

Page one of the calibration certificate is broken up into three sections. In the top third, users will find specific document information like certificate number and date as well as specific information regarding the unit under test. NOSHOK's quality statements appear in the middle third of the page.

NOSHOK certified calibrations are traceable to the National Institute of Standards and Technology. The bottom third of page one holds the authorizing signature and date of the signature.

Page two is divided into two sections. The top section of the document is reserved for the metadata of the standards used in the calibration data collection events. Here users will find all of the standards (pressure instruments, environmental monitors, etc.) used during any of the data collection events. Most significantly, this is where the calibration due dates of the standards used can be found. The second section of page two is reserved for annotations. Any notes significant to the calibration activities will be listed here. For routine calibrations, this section will often times be empty. However, things like special instructions customers may have for the calibration or device performance characteristics during data collection could also show up in this section.

Pages three and beyond are reserved for all the data associated with a data collection event. There will be one data collection event per page unless a very large data set requires multiple pages. On these pages, users will find the following four sections of information:

- A data table of the data taken during the calibration event with clear indication of standard uncertainty and allowable tolerance (by unit under test accuracy statement)
- A graph of the data collection results for clear visualization of the instrument's performance
- Laboratory conditions during the data collection event
- Event metadata including the technician, instrument grade / status, data collection type, and adjudicating accuracy statement

## Additional Highlights

It is typical within the industry of certified calibrations that customers will request their information to be listed within the calibration certificate. Customer information is also stated as a requirement in the International Standard ISO/IEC 17025. NOSHOK however takes the position that a certified calibration belongs to the unit under test and not the instigating enterprise.

Furthermore, NOSHOK's typical business includes several commercial agents in the purchase of a device and ultimate delivery to an end user. In this case, the purchasing agent may be several enterprises removed from the ultimate end user. Additionally, some certified calibrations at NOSHOK take place without an initiating order. In these cases, certifications have no other owner except the unit under test itself. Therefore, customer information may not be routinely present on calibration certificates. When it is reported, it will appear in the annotations section of the document on page two.

The output of a certified calibration event is a calibration certificate and event labels for the unit under test. NOSHOK's new calibration certificate format includes two labels which will be printed for each certified calibration. The first is the device unique identifier. This label includes NOSHOK's logo and the unique identifier of the device. The second label includes the date of last calibration with ample space for the end user to fill in the date of next calibration.

All calibration certificates will be kept on file at NOSHOK and can be reprinted or electronically supplied upon request to customer support.

Calibration lab and document title



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Berea, Ohio 44017  
+1 440 243.0888

Web: [www.noshok.com](http://www.noshok.com)  
Email: [noshok@noshok.com](mailto:noshok@noshok.com)

Calibration Certificate

Certificate Date **2020-07-16**

Certificate Number **Z00009111-20200716-134116**

Certificate number and date

Instrument Nomenclature **2.5" Brass Case, Copper Alloy Internals, 1000 psi, 1/4" NPT Male Bottom Conn, Glycerin Filled, Certified Calibration**

Instrument Unique Identifier **Z00009111**

Unit under test unique identifier

Manufacturer **NOSHOK**

Instrument Model Number **25-900-1000-psi-CC-NOSHOK**

Instrument Description **2.5" Brass Case, Copper Alloy Internals, 1000 psi, 1/4" NPT Male Bottom Conn, Glycerin Filled, Certified Calibration**

Instrument Accuracy **±1.0% Full Scale**

Quality statements

The certification of the instrument identified above is traceable to the International System of Units (SI) through the National Institute of Standards and Technology, or through globally recognized natural physical constants.

The above mentioned certification was completed in accordance with NOSHOK Quality System document 000000. Test reports without signatures are not valid.

This report applies to only the item identified above and it must not be reproduced, except in full, without the specific written consent of NOSHOK.

NOSHOK's calibration program is based on ISO/IEC 17025.

ISO 9001:2015 Certified



Authorized Signature **B. Rowley**

Authorizing signature and date

Date **2020.07.16**

Signature **B. Rowley**

Page header – certificate number and date

Certificate Number: **200009111-20200716-134116**

Certification Date: **2020-07-16**

## Standards Used

Standard used and calibration due date

Nomenclature	Model Number	Unique Identifier	Calibration Due Date
Ice/Glass Pressure Standard	29670008-01000	1737900008	<b>2021-04-12</b>
Gauge Assembly Environmental Monitor		GA Room Monitor	<b>2021-01-01</b>

## Annotations

### Customer Information

NOSHOK  
1010 W. Bagley Road  
Berea OH, 44017  
United States

Customer information and notes

Page footer – NOSHOK document number and page number

Document 1.0

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Certificate Number: **Z00009111-20200716-134116**

Certification Date: **2020-07-16**

### Data Table

Unit Under Test psi	Standard psi	Standard Deviation psi	Residual psi	Tolerance psi
0.0	0.016	0.006	0.8	16.0
200.0	200.411	0.216	-0.4	16.0
400.0	400.051	0.176	-1.1	16.0
600.0	598.256	0.336	1.7	16.0
800.0	810.987	0.481	-30.8	16.0
1000.0	1010.581	0.251	10.8	16.0
1200.0	1201.129	0.246	-8.1	16.0
1400.0	1400.079	0.236	-8.1	16.0
1600.0	1600.125	0.226	0.1	16.0
1800.0	1800.662	0.216	3.2	16.0
0.0	0.561	0.006	0.8	16.0

Data table

### Event data

### Collection Event Data

Date Collection Date: 2020-07-16  
 Data Type: As Flow  
 Instrument Status: In Tolerance  
 Calibration Technician: E. Whitten

### Laboratory conditions

Laboratory Conditions  
 Temperature: 25.0 °C  
 Relative Humidity: 56.8 %  
 Barometric Pressure: 983.7 kPa

Unit Under Test Deviation Allowance



Data table graph