

# EC Declaration of Conformity



I/We

**Crystal Engineering Corporation**

of

708 Fiero Lane, Suite 9  
San Luis Obispo, CA, 93401  
USA

declare that

<b>nVision Series Reference Pressure Recorder</b>	<b>XP2i and XP2i-DD Series Digital Pressure Gauge</b>
<b>nVision Series Lab Reference</b>	<b>M1 Series Digital Pressure Gauge</b>
<b>30 Series Digital Pressure Calibrator</b>	<b>CPF Series Fittings and Hoses</b>

in accordance with the following directives

**97/23/EC**

**Pressure Equipment Directive (PED)**

have been designed and manufactured to the following

<b>Pressure Gauges, Calibrators, and Recorders</b>		<b>CE Mark</b>
Pressure gauges, calibrators, and recorders (pressure accessories per guideline 1/6)	The above listed pressure gauges, calibrators and reference recorders are designed and manufactured in accordance with applicable portions of Annex I, Essential Safety Requirements, and sound engineering practices. These pressure gauges or calibrators (classified as pressure accessories per guideline 1/6) have a volume (V) of less than 0.1 liter (Article 3, 1.1.(a) first indent, Group 1 fluids).	
Maximum Allowable Pressure (PS) $\leq$ 200 bar (2 900 psig)	All pressure gauges, calibrators and reference recorders for use on gases or liquids less than or equal to 200 bar (2 900 psig) are not subject to the essential requirements of the directive 97/23/EC (PED, Annex I) will be classed as Sound Engineering Practice (SEP), and shall not have the CE mark applied.	No
Maximum Allowable Pressure (PS) $>$ 200 bar (2 900 psig)	For pressure gauges, calibrators and reference recorders for use on gases or liquids above 200 bar (2 900 psig) on Class 1 & 2 gases or liquids, Crystal Engineering maintains a technical file in accordance with Annex III, Module A (internal production control) when CE mark is required.  Note: CPF Hoses (MPH series) not for use with Group 1 fluids and gases	Yes

I hereby declare that the equipment named above has been designed and manufactured to comply with all essential requirements of the Directives

David K. Porter, P.E.  
(NAME OF AUTHORIZED PERSON)

Director of Engineering  
(TITLE OF AUTHORIZED PERSON)

  
(SIGNATURE OF THE AUTHORIZED PERSON)

22 July 2011  
(DATE OF ISSUE)

**BUREAU VERITAS**  
Certification



## Certification

Awarded To

### **CRYSTAL ENGINEERING CORP.**

708 FIERO LANE SUITE 9  
SAN LUIS OBISPO, CALIFORNIA, 93401

Bureau Veritas Certification North America, Inc. certifies that the management system of the above organization has been audited and found to be in accordance with the requirements of the management system standards and scope of supply detailed below

STANDARDS

**ISO 9001 :2008**

SCOPE OF SUPPLY

**DESIGN, MANUFACTURE, CALIBRATION, REPAIR AND SERVICE OF TEST AND MEASUREMENT EQUIPMENT AND SOFTWARE**

Original Approval Date: 06 September 2006

Subject to the continued satisfactory operation of the Organization's Management System, this certificate will remain valid until: 09 August 2012

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization.

Certificate No: US 09000580

Issue Date : 10 August 2009

For Bureau Veritas Certification North America, Inc.  
3663 North Sam Houston Pkwy, Houston, Texas, USA  
[www.us.bureauveritas.com/bvc](http://www.us.bureauveritas.com/bvc)





SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005  
& ANSI/NCSL Z540-1-1994

CRYSTAL ENGINEERING CORPORATION  
708 Fiero Lane, Suite 9  
San Luis Obispo, CA 93401  
Janine White Phone: 805 595 5477

CALIBRATION

Valid To: September 30, 2013

Certificate Number: 2601.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1</sup>:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
DC Voltage – Measure (For Calibration of MultiCal Series Only)  (For Calibration of PV Series Only)	(0 to 200) mV (200 to 2000) mV  (0 to 1) V	0.0080 % rdg + 0.0090 mV 0.0050 % rdg + 0.028 mV  0.0046 % rdg + 0.0070 mV	Fluke 8840A DMM  HP 34970A data acquisition switch unit
DC Voltage – Generate	Up to 111 V	0.0014 % rdg + 0.0010 V	Krohn-Hite 523 calibrator (To characterize product -20 to 50°C)
DC Current – Generate	Up to 111 mA  Up to 111 mA	0.0021 % rdg + 0.0010 mA  0.0058 % rdg + 0.0013 mA	Krohn-Hite 523 calibrator (To characterize product -20 to 50°C)  EDC 521 calibrator (To characterize product -20 to 50°C)

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Resistance – Generate Fixed Value (Four Terminal)	0.001 Ω 100 Ω 200 Ω 400 Ω	5.8 mΩ 6.2 mΩ 7.4 mΩ 11 mΩ	Company resistor box

## II. Mechanical

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Pressure – Gas	(0 to 30) psia	0.0036 psi	DHI PPC2+ pressure controller (to characterize product -20 to 50°C)
	(0 to 60) psia	0.0072 psi	
	(0 to 100) psia	0.013 psi	
	(0 to 300) psia	0.036 psi	
	(0 to 600) psia	0.072 psi	
	(0 to 1000) psia	0.13 psi	
	(0 to 15) psia (0 to 30) psia (0 to 50) psia (0 to 300) psia (0 to 600) psia (0 to 1000) psia	0.0016 psi	DHI PPC2AF pressure controller (to characterize product -20 to 50°C)
		0.0031 psi	
		0.0050 psi	
		0.031 psi	
		0.060 psi	
		0.12 psi	
	(0 to 1500) psia	0.0080 % of rdg + 0.058 psi	DHI PPC3 pressure controller (to characterize product -20 to 50°C)
(0 to 3000) psia (0 to 6000) psia (0 to 10 000) psia	0.45 psi	DHI PPCK+ pressure controller (to characterize product -20 to 50°C)	
	0.90 psi		
	1.6 psi		
(0 to 3000) psia (0 to 10 000) psia (0 to 15 000) psia	0.013 % of rdg + 0.058 psi	DHI PPCH-G pressure controller (to characterize product -20 to 50°C)	
	0.013 % of rdg + 0.58 psi		
	0.013 % of rdg + 0.58 psi		
(0 to 45) psia (0 to 51) psia (0 to 115) psia (0 to 300) psia (0 to 500) psia (0 to 600) psia (0 to 1000) psia	0.0080 % of rdg + 0.00058 psi	DHI PPC4 pressure controller (to characterize product -20 to 50 °C)	
	0.0080 % of rdg + 0.00058 psi		
	0.0080 % of rdg + 0.0058 psi		
	0.0080 % of rdg + 0.0058 psi		
	0.0080 % of rdg + 0.0058 psi		
	0.0080 % of rdg + 0.0058 psi		
	0.0080 % of rdg + 0.0058 psi		
	0.0080 % of rdg + 0.058 psi		

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Pressure – Gas (cont)	(10 to 380) kPa	0.0013 % of rdg + 4.0 Pa	DHI PG7601 base with 10 kPa/kg Piston (to characterize product -20 to 50°C)
	(70 to 3800) kPa	0.0020 % of rdg + 40 Pa	DHI PG7601 base with 100 kPa/kg Piston (to characterize product -20 to 50°C)
	(0.2 to 20) MPa	0.0020 % of rdg + 0.40 kPa	DHI PG 7202 base with 200 kPa/kg Piston (to characterize product -20 to 50°C)
	(1 to 100) MPa	0.0035 % of rdg + 4.0 kPa	DHI PG7202 base with 1 MPa/kg Piston (to characterize product -20 to 50°C)
	(0 to 16) psi	0.010 % of rdg	Reference pressure monitor DHI RPM 4
	(50 to 3000) psi	0.010 % of rdg + 0.058 psi	Degranges 5203 dead weight tester
	(250 to 10 000) psi	0.010 % of rdg + 0.58 psi	

<sup>1</sup> This laboratory does not normally offer commercial calibration service.

<sup>2</sup> Calibration and Measurement Capability (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. Calibration and Measurement Capabilities represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of  $k = 2$ . The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.



World Class Accreditation

The American Association for Laboratory Accreditation

# Accredited Laboratory

A2LA has accredited

## CRYSTAL ENGINEERING CORPORATION

*San Luis Obispo, CA*

for technical competence in the field of

### Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 4<sup>th</sup> day of August 2011.



A handwritten signature in black ink, reading "Peter Abney".

President & CEO  
For the Accreditation Council  
Certificate Number 2601.01  
Valid to September 30, 2013

*For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.*



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005  
& ANSI/NCSL Z540-1-1994

CRYSTAL ENGINEERING CORPORATION  
 708 Fiero Lane, Suite 9  
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In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1</sup>:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
DC Voltage – Measure	(0 to 200) mV	0.008 % rdg + 0.009 mV	Fluke 8840A
	(200 to 2000) mV	0.005 % rdg + 0.03 mV	
	(0 to 1 000 000) V	0.004 % rdg + 0.007 mV	Agilent 34970A
DC Voltage – Generate (-20 to 50) °C	To 111 V	12 parts in 10 <sup>6</sup> + 0.0001 V	Krohn-Hite 523
DC Current – Generate (-20 to 50) °C	To 111 mA	18 parts in 10 <sup>6</sup> + 200 nA	Krohn-Hite 523
	To 111 mA	0.005 % rdg + 1 µA	EDC 521
Resistance – Generate Fixed Value (Four Terminal)	0.005 Ω 100 Ω 200 Ω 400 Ω	0.2 µΩ 0.0042 Ω 0.0083 Ω 0.017 Ω	

*Peter Abney*

- 2 The equipment and/or protective systems of Crystal Engineering governed by the aforesaid Production Quality Assurance Notification may not be placed on the market unless the appropriate CE conformity marking accompanied by the KEMA Notified Body Identification Number 0344 is properly affixed on such equipment and/or protective systems. In accordance with article 8(3) of Directive 94/9/EC no CE marking shall be affixed on components.
- 3 This agreement shall be governed by the provisions of the General Terms and Conditions for the Performance of Assessment and Certification Services (January 2001).
- 4 This agreement will be entered into for the period of three (3) years, and may be extended repeatedly for not more than three (3) years at a time, on application filed by Crystal Engineering not later than three (3) months before the expiration of the aforesaid period of time or its extension. After receipt of such application, KEMA shall carry out a re-assessment, at its then current rates and other terms and conditions. Surveillance audits are part of this agreement.
- 5 This agreement shall be effective as of the date of issuance of the Notification.

KEMA Quality B.V.

Crystal Engineering Corporation



Maarten J. van der Dussen

David K. Porter

Arnhem, The Netherlands

San Luis Obispo, U.S.A.

Date: 2 September 2004

Date: 10 September 2004

## (1) PRODUCTION QUALITY ASSURANCE NOTIFICATION

### (2) Equipment and protective systems intended for use in potentially explosive atmospheres – Directive 94/9/EC

(3) Notification Number: **KEMA 04ATEXQ3155** Issue Number **5**

(4) This notification is issued for the equipment or protective systems or components which are described in the EC-Type Examination Certificates listed in the on-line QAR CA/CSA/QAR07.0004 on [www.iecex.com](http://www.iecex.com).

(5) Manufacturer:

**Crystal Engineering Corporation**  
**708 Fiero Lane, Suite 9**  
**San Luis Obispo, CA 93401**  
**USA**

(6) Production site:

**Crystal Engineering Corporation**  
**708 Fiero Lane, Suite 9**  
**San Luis Obispo, CA 93401**  
**USA**

(7) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, notifies to the manufacturer that the production site satisfies the requirements of Annex IV and VII to the directive.

(8) This notification is based on audit report no. CA/CSA/2010/QAR/187869-2325930.

Surveillance of the production process is part of this notification. This notification can be withdrawn if the manufacturer no longer satisfies the requirements of Annex IV and VII.

(9) This notification is valid until 2 September 2013.

(10) According to Article 10 (1) of the Directive 94/9/EC the CE marking shall be accompanied by the identification number identifying the notified body involved in the production control stage. In accordance with Article 8 (3) no components shall be affixed with the CE marking.

(11) The marking of the equipment, component or protective system shall include the identification number of KEMA:

# 0344

Arnhem, 1 November 2010  
KEMA Quality B.V.

  
T. Pijker  
Certification Manager

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° Integral publication of this certificate and adjoining reports is allowed. This Certificate may only be reproduced in its entirety and without any change.

## IECEX Quality Assessment Report: CA/CSA/QAR07.0004/02 details

<b>QAR :</b>	
QAR Reference Number *: (automatic numbering)	CA/CSA/QAR07.0004/02
Related QARs:	<a href="#">CA/CSA/QAR07.0004/00</a> <a href="#">CA/CSA/QAR07.0004/01</a>
Status*:	Issued
QAR Free Reference Number*:	CA/CSA/2009/QAR/187869-2325930
Date of Original Issue*: (yyyy-mm-dd)	2007-10-10
Details of change*:	Reassessment audit
Audit Date*: (yyyy-mm-dd)	2010-08-10
Site(s) audited*:	Crystal Engineering Corporation 708 Fiero Lane, Suite 9 San Luis Obispo, California 93401 U.S.A.
Issuing ExCB*:	CSA - CSA International
Manufacturer*:	Crystal Engineering Corporation 708 Fiero Lane, Suite 9 San Luis Obispo, California 93401 U.S.A.
Country of Manufacture*:	United States of America
Product information*:	Digital Test Gauges and Pressure Recorders
Valid until*: (yyyy-mm-dd)	2013-09-02
Protection concept*:	Intrinsic Safety Ex i
Related IECEX Certificates: (automatic linking)	-
Related Certificates: (manual insertion)	IECEX CSA 05.0001X KEMA 04 ATEX 1053X FTZU 06ATEX0010X SIRA 09ATEX2008X
Related IECEX Certificates for all previous versions:	<a href="#">IECEX SIR 09.0053X issue: 0 [Current]</a> <a href="#">IECEX SIR 09.0053X issue: 1 [Current]</a> <a href="#">IECEX FTZU 10.0018X issue: 0 [Current]</a>
Comment:	The listed ATEX Certificates are related to KEMA Notification No. 04ATEXQ3155.  Validity: 2013-09-02
Attachment:	



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **A-12120**

This is to certify that the  
**Test and Calibration Equipment**

with type designation(s)  
**Crystal Products Pressure and Temperature Calibrator Kits**

Manufactured by  
**Crystal Engineering Corporation**  
**SAN LUIS OBISPO CA, United States**

is found to comply with  
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

Application  
**The instruments are only approved for use as portable test instruments.**  
**Traceable calibration certificates are available from the manufacturer.**



Høvik, 2011-03-14  
for Det Norske Veritas AS



This Certificate is valid until  
**2015-06-30**

  
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**Odd Magne Nesvåg**  
Head of Section

DNV local office:  
Houston

  
-----  
**Ståle Sneen**  
Surveyor 

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.  
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.  
If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Certificate No.: A-12120  
 File No.: 890.90  
 Job Id.: 262.1-004538-2

## Product description

Crystal Engineering Corp. pressure and temperature calibrator kits as listed below:

Model	Description	Range	Datasheet
CPF Fittings	MPH-/MPM-/MPF-series	-	3833E
30-series	Pressure gauges	16 to 5000 PSI	4468B, 4534C, 4598C, 4599C
XP2i-series	Pressure gauges	15 to 10000 PSI	3104D
nVision	Calibrator		3831F
	Pressure – PM Module	30 to 15000 PSI	
	Current/Voltage – MA20 Module	0 to 25mA / 0 to 28VDC	
	Temperature – RTD 100 Module	0 to 400 Ohms	
	Barometric – BARO Module	10.153 to 15.954 PSI	
M1-series	Pressure gauges	15 to 15000 PSI	3501F
MultiCal	Pressure module	up to 500 PSI	3344 0
2907 Combo Pump	Pressure source	300 PSI	2909B
2908 Combo Pump	Pressure source	500 PSI	2909B
GaugeCalXP	Pressure source	10000 PSI	3173D
Tempcal 140F	Temperature calibrator	140°C	Haven Crystal Instruments LTD.
Tempcal 425F	Temperature calibrator	425°C	
Tempcal 650F	Temperature calibrator	650°C	

Each kit consists of a Crystal pressure product, a Crystal pressure source and a Haven Crystal temperature calibrator and hoses and adapters. 30 Series Pressure sources are available in equivalent BAR or kPa; XP2i and nVision Pressure modules are available in equivalent BAR, kPa or MPa; M1 is available in equivalent BAR, Kg/cm<sup>2</sup>, kPa or MPa; MultiCal is available in H<sub>2</sub>O/PSI, Hg/PSI, HgA/mmHgA or mmHgA/PSIA.

## Place of manufacture

Crystal Engineering Corporation  
 708 Fiero Lane Suite 9  
 San Luis Obispo, CA USA 93401

Haven Crystal Instruments LTD Tempcal products manufactured by  
 Haven Automation Ltd.  
 Swansea, UK

## Application/Limitation

The Type Approval covers hardware listed under product description.  
 The instruments are only approved for use as portable test instruments.  
 The Type Approval of gauges and calibrators are only valid for units with a valid calibration certificate.

Ex-certification is not covered by this certificate and the following paragraph, which is for information only, is based on information received from the manufacturer, but not verified by DNV.

Information on Ex-Certification received from manufacturer – Not verified by DNV		
Equipment	Certified	Certificate No.
30-series	ATEX:  II 2 G Ex ia IIC T4 Gb, Ta = 0°C to 50°C IECEX scheme: Ex ia IIC T4 Gb	FTZU 06 ATEX 0010X IECEX FTZU 10.0018X
XP2i, XP2i-DD	ATEX:  II 1 G Ex ia IIC T4, Ta = -20°C to 40°C IECEX scheme: Ex ia IIC T4	KEMA 04ATEX1053 X IECEX CSA 05.0001X
nVision	ATEX:  II 1 G Ex ia IIB T4 Ga, Ta = -20°C to 45 or 50°C, or ATEX:  II 1 G Ex ia IIB T3 Ga, Ta = -20°C to 50°C IECEX scheme: Ex ia IIB T4 Ga, Ta = -20°C to 45 or 50°C, or IECEX scheme: Ex ia IIB T3 Ga, Ta = -20°C to 50°C	Sira 09ATEX2008X IECEX SIR 09.0053X



Certificate No.: A-12120  
File No.: 890.90  
Job Id.: 262.1-004538-2

## Type Approval documentation

Product data sheets:

2909 rev.B, 3104 rev.D, 3173 rev.D, 3344 Rev.0 (12/02), 3501 rev.F, 3831 rev.F, 3833 Rev.E, 4468 rev.B, 4534 rev.C, 4598 rev.C, 4599 rev.C, Tempcal 140F 425F 650F Brochure

The type approval testing is documented by test reports and certificates of calibration:

Example certificates of calibration:

Crystal Engineering Corp. No. 74995 (IS33-36/3000PSI) dated 2007-11-19  
Crystal Engineering Corp. No. 74508 (10KPSIXP2I) dated 2007-11-05  
Crystal Engineering Corp. No. 74542 (M1-10KPSI) dated 2007-11-06  
Crystal Engineering Corp. No. 72604 (H2O/PSI) dated 2007-09-26  
Crystal Engineering Corp. No. 124506 (10KPSI Module) dated 2011-01-20  
Crystal Engineering Corp. No. 122507 (BARO Module) dated 2010-12-07  
Crystal Engineering Corp. No. 124397 (MA20 Module) dated 2011-01-18  
Crystal Engineering Corp. No. 33289 (RTD100 Module) dated 2011-01-31  
Haven Automation Ltd. No. 01948/T (Tempcal 140F) dated 2007-05-01  
Barloworld Scientific Ltd. Certificate (Tempcal 425F) dated 2007-11-19  
Haven Automation Ltd. No. 01691/T (Tempcal 650F) dated 2005-10-18

Test reports:

Crystal Engineering Corp. 2907 Data Collection Report dated 2007-11-21  
Crystal Engineering Corp. 2908 Data Collection Report dated 2007-11-21  
Crystal Engineering Corp. GaugeCalXP Data Collection Report dated 2007-11-12  
Crystal Engineering Corp. Multical 500psi 150% Pressure Test Report dated 2007-11-21  
Crystal Engineering Corp. ETR-236 30 Series Sensor Burst Test  
Crystal Engineering Corp. ETR-225 Model 87N for 15KPSI DVT  
CSA LR 110579-1 Pressure test report  
CSA 6122672 Pressure test report  
XP2i IP67 Test Certificate no. CTC 8930A dated 2009-02-09  
nVision IP67 Test Certificate no. Sira 52A19587Alab dated 2009-04-14

DNV Houston type approval survey report dated 2011-02-16

## Tests carried out

Each gauge and temperature calibrator has been calibrated at factory and is delivered with a valid calibration certificate. 2907, 2908 and GaugeCalXP pressure sources have been pressure- and leakage tested of up to 100% of design pressure. 150% pressure test (or higher) has been performed for all gauge designs.

## Marking of product

Each model is marked with manufacturer name, model name and serial number.

## Certificate retention survey

The scope of the retention/renewal survey is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the survey are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Retention survey is to be performed at least every second year and at renewal of this certificate.

END OF CERTIFICATE