

Customer

Cleanroom Technology Austria GmbH
IZ NÖ-Süd, Straße 10, Objekt 60
A-2355 Wiener Neudorf
Österreich

Instrument

Type: Airborne Particle Counter
Manufacturer: Lighthouse Worldwide Solutions
Model: Handheld 3016 IAQ
Serial no.: 190144001
Customer device ID.: 12000947

Date of receipt

12. January 2026

Calibration date

13. January 2026

Due date of calibration

January 2027

Calibration Location

A-2512 Oeynhausen

Calibration methode

Calibration has been accomplished as described in ISO 21501-4:2018, excluding 6.5 & 6.8. All work performed according to ccstec Sop 03.02.03 Partikelzähler Kalibrierung.

Results

All measured values comply with the specification limit(s).
The unit is readjusted.
The following results refer only to the particle counter listed above
The result of the measurements are shown on the following pages.

Traceability

Reference equipment used for calibration are regularly calibrated and traceable to national standards.

Uncertainty

Results without consideration of uncertainty. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k = 2$, which provides a confidence level of approximately 95%. The standard uncertainty is determined in accordance with EA-4/02. Decision rules are not applied according to 21501-4 Annex E.4

Calibrated by:


Tobias Eisner
13. January 2026

(Name, Date, Signature)

Approved by:


Daniel Poppinger
13. JAN. 2026

(Name, Date, Signature)

Calibration Service

CCSTEC GesmbH
2512 Oeynhausen

Triesterstraße 36
Austria

Tel: +43 2252/25 27 59-0
E-Mail: office@ccstec.at

This calibration certificate is only valid and may only be reproduced in full (3 Pages). Calibration certificate without both signatures is invalid.

Reproduction in part or in whole is only permitted with the consent of ccstec.

Page 1/3

Date of calibration 13. January 2026

Calibrated by Tobias Eisner

Environmental conditions 20,1 °C to 20,9 °C 39,9 %rF to 41,7 %rF

Results, As found**Performance details**

Test	Test result	Expanded uncertainty	Criteria	Pass / Fail
ISO21501-4 Sampling Flow rate error	4,18 % $\pm$ 0,12 l/min	0,34 %	2,8 l/min. $\pm$ 5%	Pass
JIS B 9921 Zero count	0 particles in 5 min. Upper confidence level	n.a.	< 1 in 5 min.	Pass
ISO21501-4 False count rate	211,89 particles/m ³	n.a.	n.a.	Pass
ISO21501-4 Sampling time error	0,02 % $\pm$ 0,010 sec.	0,40 sec.	< 1%	Pass
ISO21501-4 Size resolution	9,03 % used size 0,40 μ m	1,91 %	< 15%	Pass
ISO21501-4 Counting efficiency 50%	55,72 % used size 0,30 μ m	5,62 %	(50 $\pm$ 20)%	Pass
ISO21501-4 Counting efficiency 100%	102,80 % used size 0,50 μ m	4,71 %	(100 $\pm$ 10)%	Pass

Size calibration

Channel	Channel Size	Threshold voltage	Calculated Size	Expanded uncertainty	Calculated Sizing error ($\pm$ 10%)	Pass / Fail
1.	0,30 μ m	55 mV	0,298 μ m	0,0122 μ m	-0,69 %	Pass
2.	0,50 μ m	434 mV	0,505 μ m	0,0184 μ m	0,94 %	Pass
3.	1,00 μ m	1373 mV	1,021 μ m	0,0479 μ m	2,08 %	Pass
4.	2,50 μ m	2252 mV	2,411 μ m	0,1121 μ m	-3,56 %	Pass
5.	5,00 μ m	4816 mV	5,013 μ m	0,2013 μ m	0,25 %	Pass
6.	10,00 μ m	6482 mV	10,472 μ m	0,3330 μ m	4,72 %	Pass

Fault description

n.a.

Reference Equipment

Internal ID	Model	Serial Number	Certificate Number	Due date
C139	TSi 4043 H	40432519005	113926	05.08.2026
C128	Jumbo-Digit Stopwatch	240174429	E349371	18.07.2026
C140	MCA 8000D	52479	2512-05729	10.12.2026
C94	Testo 622	39518351	AF5509	09.12.2026
C96	Solair 3100 GenE	190504038	C09966	10.07.2026
C97	Remote 2014	191121036	C09984	15.07.2026

Reference Particle Standards

Size	Description	Due date	Lot#
0,30 μ m	3300A & 3300B, Nanosphere™ Size Standards	Jun-27	281235
0,40 μ m	3400A, Nanosphere™ Size Standards	Aug-27	283679
0,50 μ m	3500 & 3500A, Nanosphere™ Size Standards	May-27	279810
1,00 μ m	4009, 4009A & 4009B, DUKE STANDARDS™ Microsphere Size Standards	Jan-27	275827
2,50 μ m	11025-20, MicroStandards™ - 11000 series	Mar-26	CS0008.2123
5,00 μ m	4D-05, DUKE STANDARDS™ Dry Microsphere Size Standards	Jan-26	263147
10,00 μ m	4D-10, DUKE STANDARDS™ Dry Microsphere Size Standards	Dec-27	287466

Date of calibration 13. January 2026

Calibrated by Tobias Eisner

Environmental conditions 20,9 °C to 20,9 °C 41,6 %rF to 41,8 %rF

Results, As left

Performance details

Test	Test result	Expanded uncertainty	Criteria	Pass / Fail
ISO21501-4 Sampling Flow rate error	4,18 % $\pm$ 0,12 l/min	0,34 %	2,8 l/min. $\pm$ 5%	Pass
JIS B 9921 Zero count	0 particles in 5 min. Upper confidence level	n.a.	< 1 in 5 min.	Pass
ISO21501-4 False count rate	211,89 particles/m ³	n.a.	n.a.	Pass
ISO21501-4 Sampling time error	0,15 % $\pm$ 0,090 sec.	0,40 sec.	< 1%	Pass
ISO21501-4 Size resolution	9,03 % used size 0,40 μ m	1,91 %	< 15%	Pass
ISO21501-4 Counting efficiency 50%	49,43 % used size 0,30 μ m	5,62 %	(50 $\pm$ 20)%	Pass
ISO21501-4 Counting efficiency 100%	100,07 % used size 0,50 μ m	4,71 %	(100 $\pm$ 10)%	Pass

Size calibration

Channel	Channel Size	Threshold voltage	Calculated Size	Expanded uncertainty	Calculated Sizing error ($\pm$ 10%)	Pass / Fail
1.	0,30 μ m	58 mV	0,300 μ m	0,0122 μ m	-0,03 %	Pass
2.	0,50 μ m	430 mV	0,503 μ m	0,0184 μ m	0,56 %	Pass
3.	1,00 μ m	1350 mV	1,001 μ m	0,0479 μ m	0,07 %	Pass
4.	2,50 μ m	2320 mV	2,498 μ m	0,1121 μ m	-0,07 %	Pass
5.	5,00 μ m	4816 mV	5,013 μ m	0,2013 μ m	0,25 %	Pass
6.	10,00 μ m	6340 mV	10,016 μ m	0,3330 μ m	0,16 %	Pass

Fault description

n.a.

Reference Equipment

Internal ID	Model	Serial Number	Certificate Number	Due date
C139	TSI 4043 H	40432519005	113926	05.08.2026
C128	Jumbo-Digit Stopwatch	240174429	E349371	18.07.2026
C140	MCA 8000D	52479	2512-05729	10.12.2026
C94	Testo 622	39518351	AF5509	09.12.2026
C96	Solair 3100 GenE	190504038	C09966	10.07.2026
C97	Remote 2014	191121036	C09984	15.07.2026

Reference Particle Standards

Size	Description	Due date	Lot#
0,30 μ m	3300A & 3300B, Nanosphere™ Size Standards	Jun-27	281235
0,40 μ m	3400A, Nanosphere™ Size Standards	Aug-27	283679
0,50 μ m	3500 & 3500A, Nanosphere™ Size Standards	May-27	279810
1,00 μ m	4009, 4009A & 4009B, DUKE STANDARDS™ Microsphere Size Standards	Jan-27	275827
2,50 μ m	11025-20, MicroStandards™ - 11000 series	Mar-26	CS0008.2123
5,00 μ m	4D-05, DUKE STANDARDS™ Dry Microsphere Size Standards	Jan-26	263147
10,00 μ m	4D-10, DUKE STANDARDS™ Dry Microsphere Size Standards	Dec-27	287466