Preventive Maintenance Order

Work Order: 105 (DEMO Recertification Room G01 R28)

Asset: DEMO G01 Room R43 (Room 43)

Building | Room: Site01 DEMO R43

Signature 08. Apr 2025 13:39:31 (UTC)

Tech. O: t.muenzer

Main Work Ctr.:

Maint. Plan | Item: DEMO WPL1211 / 900600228001

Basic Start Date: 01 Feb 2025 **Basic Finish Date:** 30 Apr 2025

Printed: 08 Apr 2025 15:39:30 +02:00

Begin of Measurements: 25 Feb 2025 14:39:38+01:00

W. Europe Standard Time (UTC +02:00)

Guideline Specifications:

Asset Status

Asset available ☒ YES ▢ NO ▢ n.d.

Operation	Short-Text	Package
0010	n.a.	1J

Document(s)

DEMO Doc. 111	Classification Cleanrooms
DEMO Doc. 112	Measuring Point Plan 112

Operation(s)

Number	Long-Text	Observation[1]			
		O	C	R	N
0010	n.a.	X			

Conclusion:

Asset suitable for operation ☒ YES ▢ NO ▢ n.d.

Remarks: ▢ YES ☒ NO

Completed by:

For signatures, ratings and comments, see the following page(s) for each measurement

Approved by:

n.a., n.a., n.a.

Name, Login, Date

Comment: n.a.

1) **O** - Okay **C** - Correction needed **R** - Correction needed, already repaired **N** - Not relevant / Observation has to be marked with X

PARMESS

Cleanroom Measurement

Creation date: 08 Apr 2025 15:39:29

Order-Configuration Number: 105

SAP-Group:

Name: DEMO Building 01 Room R43 **Type:** 205 - at Rest

Description: DEMO Recertification Cleanroom **Maint. Item:** 900600228001

Measurement point group (Measurement type)	Building	Room	OCRN Group	Equipment No.	Measurement Point	OCRN Measurem. Point
DEMO Room G01 R28 Classification at Rest (Room at Rest)	DEMO Geb01	DEMO R28	O		DEMO 01	O
					DEMO 02	O
					DEMO 03	O
					DEMO 04	O
					DEMO 05	O
					DEMO 06	O
					DEMO 07	O
					DEMO 08	O
					DEMO 09	O
					DEMO 10	O
DEMO Room G01 R28 Monitoring in Operation (Room in Operation)	DEMO Geb01	DEMO R28	O		DEMO 01	O
					DEMO 02	O
					DEMO 03	O
					DEMO 04	O
					DEMO 05	O
					DEMO 06	O
					DEMO 07	O
					DEMO 08	O
					DEMO 09	O
					DEMO 10	O
DEMO Room G01 R28 Filter test (Filter Test)	DEMO Geb01	DEMO R28	O		DEMO F10	O
					DEMO F11	O

PARMESS

Cleanroom Measurement

Creation date: 08 Apr 2025 15:39:29

Order-Configuration Number: 105

Measurement point group (Measurement type)	Building	Room	OCRN Group	Equipment No.	Measurement Point	OCRN Measurem. Point
					DEMO F12	O
					DEMO F13	O
					DEMO F14	O
					DEMO F15	O
DEMO Room G01 R28 Air Exchange Rate (Air exchange)	60	02.28	O	n.a.	DEMO R28-F10	O
					DEMO R28-F11	O
					DEMO R28-F12	O
					DEMO R28-F13	O
					DEMO R28-F14	O
					DEMO R28-F15	O

Protocol Particle Measurement

PARMESS

MAM Cleanroom Measurement

In the following, all times are shown in local time with the corresponding UTC offset.

Print date: 08. Apr 2025 (Europe/Berlin (UTC +2:00))

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28
Equipment No.:	n.d.	Requirement:	ISO 8.0
Start measuring:	26. Feb 2025		
Measurement point group:	DEMO Room G01 R28 Monitoring in Operation		
Description:	Perform monitoring in the room according to the sampling point plan.		

Measuring device used:

Particle measuring device name	Flow	Calibrated until
M0493	472.000 [cm³/s]	03. May 2025
M0494	472.000 [cm³/s]	03. May 2025

Measuring notebook name
VMWIN11MOQLERO

Test Print

Evaluation:

Number of people present:	3
Total sampling volume:	0.8638 [m³]
Measurement duration per sample:	61 s
Action limit for particle ≥ 0,5 µm:	3520000 [1/m³]
Action limit for particle ≥ 5 µm:	29300 [1/m³]
Warning limit for particle ≥ 0,5 µm:	n.d.
Warning limit for particle ≥ 5 µm:	n.d.

Comment: n.d.

	Measurements								
Measurement point No.	**Sample No.**	**Time**	**Device status**	**Particle ≥ 0,5 µm [1/m³]**	**Particle ≥ 5 µm [1/m³]**	**Complied with Warning limit**	**Complied with Action limit**	**OCRN**	**Comment measurer**
DEMO 01	1	08:01:45+01:00	OK	1945	0	yes	yes	O	n.d.
DEMO 01	2	08:02:54+01:00	OK	7190	70	yes	yes	O	n.d.
DEMO 01	3	08:04:01+01:00	OK	765	0	yes	yes	O	n.d.
DEMO 02	1	08:02:07+01:00	OK	278	0	yes	yes	O	n.d.
DEMO 02	2	08:03:16+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 02	3	08:04:23+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 03	1	08:05:47+01:00	OK	209	0	yes	yes	O	n.d.
DEMO 03	2	08:06:56+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 03	3	08:08:03+01:00	OK	35	35	yes	yes	O	n.d.
DEMO 04	1	08:05:58+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 04	2	08:07:07+01:00	OK	35	0	yes	yes	O	n.d.
DEMO 04	3	08:08:14+01:00	OK	0	0	yes	yes	O	n.d.

Signature 08. Apr. 2025 13:30:56 (UTC)

Protocol Particle Measurement

PARMESS

MAM Cleanroom Measurement

In the following, all times are shown in local time with the corresponding UTC offset.

Print date: 08. Apr 2025 (Europe/Berlin (UTC +2:00))

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28
Equipment No.:	n.d.	Requirement:	ISO 8.0
Start measuring:	26. Feb 2025		
Measurement point group:	DEMO Room G01 R28 Monitoring in Operation		

	Measurements								
Measurement point No.	**Sample No.**	**Time**	**Device status**	**Particle ≥ 0,5 µm [1/m³]**	**Particle ≥ 5 µm [1/m³]**	**Complied with Warning limit**	**Complied with Action limit**	**OCRN**	**Comment measurer**
DEMO 05	1	08:09:34+01:00	OK	209	35	yes	yes	O	n.d.
DEMO 05	2	08:10:43+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 05	3	08:11:50+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 06	1	08:09:48+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 06	2	08:10:57+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 06	3	08:12:04+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 07	1	08:13:25+01:00	OK	35	0	yes	yes	O	n.d.
DEMO 07	2	08:14:34+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 07	3	08:15:41+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 08	1	08:13:36+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 08	2	08:14:45+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 08	3	08:15:52+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 09	1	08:17:13+01:00	OK	174	0	yes	yes	O	n.d.
DEMO 09	2	08:18:21+01:00	OK	1390	174	yes	yes	O	n.d.
DEMO 09	3	08:19:28+01:00	OK	1945	70	yes	yes	O	n.d.
DEMO 10	1	08:17:26+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 10	2	08:18:35+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 10	3	08:19:42+01:00	OK	244	0	yes	yes	O	n.d.

Test Print

Requirements are fulfilled: **Yes**

Result: **O** (Where O=Okay; C=Correction needed ; R=Repaired ; N=Not Found / Measured)

Measured by: **Doe, John** **(jdoe)**

Participants: n.d. n.d.

Protocol Particle Measurement

PARMESS

MAM Cleanroom Measurement

In the following, all times are shown in local time with the corresponding UTC offset.

Print date: 08. Apr 2025 (Europe/Berlin (UTC +2:00))

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28
Equipment No.:	n.d.	Requirement:	ISO 7.0
Start measuring:	26. Feb 2025		
Measurement point group:	DEMO Room G01 R28 Classification at Rest		
Description:	Perform classification in the room according to the sampling point plan		

Measuring device used:

Particle measuring device name	Flow	Calibrated until
M0493	472.000 [cm³/s]	03. May 2025
M0494	472.000 [cm³/s]	03. May 2025

Measuring notebook name
VMWIN11MOQLERO

Test Print

Evaluation:

Number of people present:	n.d.
Total sampling volume:	0.8638 [m³]
Measurement duration per sample:	61 s
Action limit for particle ≥ 0,5 µm:	352000 [1/m³]
Action limit for particle ≥ 5 µm:	2930 [1/m³]
Warning limit for particle ≥ 0,5 µm:	n.d.
Warning limit for particle ≥ 5 µm:	n.d.

Comment: n.d.

	Measurements								
Measurement point No.	Sample No.	Time	Device status	Particle ≥ 0,5 µm [1/m³]	Particle ≥ 5 µm [1/m³]	Complied with Warning limit	Complied with Action limit	OCRN	Comment measurer
DEMO 01	1	08:21:14+01:00	OK	695	35	yes	yes	O	n.d.
DEMO 01	2	08:22:22+01:00	OK	1147	70	yes	yes	O	n.d.
DEMO 01	3	08:23:29+01:00	OK	278	35	yes	yes	O	n.d.
DEMO 02	1	08:21:25+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 02	2	08:22:33+01:00	OK	35	0	yes	yes	O	n.d.
DEMO 02	3	08:23:40+01:00	OK	35	0	yes	yes	O	n.d.
DEMO 03	1	08:25:05+01:00	OK	35	0	yes	yes	O	n.d.
DEMO 03	2	08:26:14+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 03	3	08:27:21+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 04	1	08:25:20+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 04	2	08:26:29+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 04	3	08:27:36+01:00	OK	0	0	yes	yes	O	n.d.

Signature 08. Apr 2025 13:31:02 (UTC)

Protocol Particle Measurement

PARMESS

MAM Cleanroom Measurement

In the following, all times are shown in local time with the corresponding UTC offset.

Print date: 08. Apr 2025 (Europe/Berlin (UTC +2:00))

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28
Equipment No.:	n.d.	Requirement:	ISO 7.0
Start measuring:	26. Feb 2025		
Measurement point group:	DEMO Room G01 R28 Classification at Rest		

	Measurements								
Measurement point No.	**Sample No.**	**Time**	**Device status**	**Particle ≥ 0,5 µm [1/m³]**	**Particle ≥ 5 µm [1/m³]**	**Complied with Warning limit**	**Complied with Action limit**	**OCRN**	**Comment measurer**
DEMO 05	1	08:28:56+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 05	2	08:30:05+01:00	OK	487	0	yes	yes	O	n.d.
DEMO 05	3	08:31:12+01:00	OK	869	0	yes	yes	O	n.d.
DEMO 06	1	08:29:09+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 06	2	08:30:17+01:00	OK	35	0	yes	yes	O	n.d.
DEMO 06	3	08:31:24+01:00	OK	174	0	yes	yes	O	n.d.
DEMO 07	1	08:32:51+01:00	OK	174	35	yes	yes	O	n.d.
DEMO 07	2	08:34:00+01:00	OK	244	0	yes	yes	O	n.d.
DEMO 07	3	08:35:07+01:00	OK	105	0	yes	yes	O	n.d.
DEMO 08	1	08:33:08+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 08	2	08:34:16+01:00	OK	35	0	yes	yes	O	n.d.
DEMO 08	3	08:35:24+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 09	1	08:36:45+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 09	2	08:37:54+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 09	3	08:39:01+01:00	OK	35	0	yes	yes	O	n.d.
DEMO 10	1	08:36:55+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 10	2	08:38:04+01:00	OK	0	0	yes	yes	O	n.d.
DEMO 10	3	08:39:11+01:00	OK	0	0	yes	yes	O	n.d.

Test Print

Requirements are fulfilled: **Yes**

Result: **O** (Where O=Okay; C=Correction needed ; R=Repaired ; N=Not Found / Measured)

Measured by:	**Doe, John**	**(jdoe)**
Participants:	n.d.	n.d.

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F10			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Measuring device used:

Particle measuring device	Name	Flow	Next calibration
Raw air	M0494	472.000 [cm³/s]	03. May 2025
Clean air	M0493	472.000 [cm³/s]	03. May 2025

Differential pressure measuring device	Next calibration
M0492	13. May 2025

Dilution stage	Dilution factor	Next calibration
M0555	100	11. Jun 2025

Probe	Measuring notebook
Rund 36mm	VMWIN11MOQLERO

Test Print

Filter test measurement results

Filter type	Visual Inspection OK	Differential pressure [Pa]			Scan / Leak test ok
		Actual	Max.	Result	
supply air filter	n.d.	95.0	500.0	ok	ok

Overall result	O

Measured by: **John, Doe (jdoe)**

Participants: n.d. n.d.

Signature 08. Apr 2025 13:31:03 (UTC)

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F10			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Dynamic measurement

Probe geometry:

Effective width [cm]:	2.55
Height [cm]:	n.d.
Diameter [cm]:	3.60

Parameter scantest

Scan velocity [cm/s]:	5.0
Track overlap [cm]:	5.0
N_a [1]:	0
N_p [1]:	4
P_L [%]:	1.00
Flow raw air [m³/s]:	0.00047200
Minimum raw air concentration [1/m³]:	166,822,368
Scan time calculated [min]:	5

Evaluation scantest

Number of possible leaks:	0

Test Print

Measurement results dynamic measurement

No.	Raw air				Clean air			Penetration rate [%]
	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm [1/m³]	Requirements fulfilled *	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm	
1	25. Feb 2025 14:42:35+01:00	60	261,740,824	Yes	25. Feb 2025 14:42:36+01:00	60	0	0.00000
2	25. Feb 2025 14:43:36+01:00	60	260,437,858	Yes	25. Feb 2025 14:43:35+01:00	60	0	0.00000
3	25. Feb 2025 14:44:35+01:00	60	261,550,146	Yes	25. Feb 2025 14:44:35+01:00	60	0	0.00000
4	25. Feb 2025 14:45:35+01:00	60	263,795,908	Yes	25. Feb 2025 14:45:35+01:00	60	0	0.00000
5	25. Feb 2025 14:46:36+01:00	60	264,053,677	Yes	25. Feb 2025 14:46:35+01:00	60	0	0.00000
Summary		300	n.d.	Yes	n.d.	300	n.d.	n.d.

* Particle concentration ≥ 0.3µm [1/m³] > Minimum raw air concentration [1/m³]

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F11			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Measuring device used:

Particle measuring device	Name	Flow	Next calibration
Raw air	M0494	472.000 [cm³/s]	03. May 2025
Clean air	M0493	472.000 [cm³/s]	03. May 2025

Differential pressure measuring device	Next calibration
M0492	13. May 2025

Dilution stage	Dilution factor	Next calibration
M0555	100	11. Jun 2025

Probe	Measuring notebook
Rund 36mm	VMWIN11MOQLERO

Test Print

Filter test measurement results

Filter type	Visual Inspection OK	Differential pressure [Pa]			Scan / Leak test ok
		Actual	Max.	Result	
supply air filter	n.d.	95.0	500.0	ok	ok

Overall result	O

Measured by: **John, Doe (jdoe)**

Participants: n.d. n.d.

Signature 08. Apr 2025 13:31:04 (UTC)

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F11			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Dynamic measurement

Probe geometry:

Effective width [cm]:	2.55
Height [cm]:	n.d.
Diameter [cm]:	3.60

Parameter scantest

Scan velocity [cm/s]:	5.0
Track overlap [cm]:	5.0
N_a [1]:	0
N_p [1]:	4
P_L [%]:	1.00
Flow raw air [m³/s]:	0.00047200
Minimum raw air concentration [1/m³]:	166,822,368
Scan time calculated [min]:	5

Evaluation scantest

Number of possible leaks:	0

Test Print

Measurement results dynamic measurement

No.	Raw air				Clean air			Penetration rate [%]
	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm [1/m³]	Requirements fulfilled *	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm	
1	25. Feb 2025 14:48:15+01:00	60	263,584,044	Yes	25. Feb 2025 14:48:17+01:00	60	0	0.00000
2	25. Feb 2025 14:49:15+01:00	60	265,077,688	Yes	25. Feb 2025 14:49:16+01:00	60	0	0.00000
3	25. Feb 2025 14:50:15+01:00	60	267,478,818	Yes	25. Feb 2025 14:50:16+01:00	60	0	0.00000
4	25. Feb 2025 14:51:15+01:00	60	263,827,688	Yes	25. Feb 2025 14:51:16+01:00	60	0	0.00000
5	25. Feb 2025 14:52:15+01:00	60	264,177,264	Yes	25. Feb 2025 14:52:16+01:00	60	1	0.00001
Summary		300	n.d.	Yes	n.d.	300	n.d.	n.d.

* Particle concentration ≥ 0.3µm [1/m³] > Minimum raw air concentration [1/m³]

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F12			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Measuring device used:

Particle measuring device	Name	Flow	Next calibration
Raw air	M0494	472.000 [cm³/s]	03. May 2025
Clean air	M0493	472.000 [cm³/s]	03. May 2025

Differential pressure measuring device	Next calibration
M0492	13. May 2025

Dilution stage	Dilution factor	Next calibration
M0555	100	11. Jun 2025

Probe	Measuring notebook
Rund 36mm	VMWIN11MOQLERO

Test Print

Filter test measurement results

Filter type	Visual Inspection OK	Differential pressure [Pa]			Scan / Leak test ok
		Actual	Max.	Result	
supply air filter	n.d.	95.0	500.0	ok	ok

Overall result	O

Measured by: **John, Doe (jdoe)**

Participants: n.d. n.d.

Signature 08. Apr 2025 13:06:03 (UTC)

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F12			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Dynamic measurement

Probe geometry:

Effective width [cm]:	2.55
Height [cm]:	n.d.
Diameter [cm]:	3.60

Parameter scantest

Scan velocity [cm/s]:	5.0
Track overlap [cm]:	5.0
N_a [1]:	0
N_p [1]:	4
P_L [%]:	1.00
Flow raw air [m³/s]:	0.00047200
Minimum raw air concentration [1/m³]:	166,822,368
Scan time calculated [min]:	5

Evaluation scantest

Number of possible leaks:	0

Test Print

Measurement results dynamic measurement

No.	Raw air				Clean air			Penetration rate [%]
	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm [1/m³]	Requirements fulfilled *	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm	
1	25. Feb 2025 14:53:51+01:00	60	266,493,649	Yes	25. Feb 2025 14:53:53+01:00	60	0	0.00000
2	25. Feb 2025 14:54:51+01:00	60	265,017,660	Yes	25. Feb 2025 14:54:52+01:00	60	21	0.00028
3	25. Feb 2025 14:55:51+01:00	60	263,975,993	Yes	25. Feb 2025 14:55:52+01:00	60	18	0.00024
4	25. Feb 2025 14:56:51+01:00	60	263,057,914	Yes	25. Feb 2025 14:56:52+01:00	60	357	0.00479
5	25. Feb 2025 14:57:51+01:00	60	262,005,654	Yes	25. Feb 2025 14:57:52+01:00	60	484	0.00652
Summary		300	n.d.	Yes	n.d.	300	n.d.	n.d.

* Particle concentration ≥ 0.3µm [1/m³] > Minimum raw air concentration [1/m³]

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F13			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Measuring device used:

Particle measuring device	Name	Flow	Next calibration
Raw air	M0494	472.000 [cm³/s]	03. May 2025
Clean air	M0493	472.000 [cm³/s]	03. May 2025

Differential pressure measuring device	Next calibration
M0492	13. May 2025

Dilution stage	Dilution factor	Next calibration
M0555	100	11. Jun 2025

Probe	Measuring notebook
Rund 36mm	VMWIN11MOQLERO

Test Print

Filter test measurement results

Filter type	Visual Inspection OK	Differential pressure [Pa]			Scan / Leak test ok
		Actual	Max.	Result	
supply air filter	n.d.	95.0	500.0	ok	ok

Overall result	O

Measured by: **John, Doe (jdoe)**

Participants: n.d. n.d.

Signature 08. Apr 2025 13:35:55 (UTC)

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F13			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Dynamic measurement

Probe geometry:

Effective width [cm]:	2.55
Height [cm]:	n.d.
Diameter [cm]:	3.60

Parameter scantest

Scan velocity [cm/s]:	5.0
Track overlap [cm]:	5.0
N_a [1]:	0
N_p [1]:	4
P_L [%]:	1.00
Flow raw air [m³/s]:	0.00047200
Minimum raw air concentration [1/m³]:	166,822,368
Scan time calculated [min]:	5

Evaluation scantest

Number of possible leaks:	0

Test Print

Measurement results dynamic measurement

No.	Raw air				Clean air			Penetration rate [%]
	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm [1/m³]	Requirements fulfilled *	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm	
1	25. Feb 2025 14:59:51+01:00	60	261,892,660	Yes	25. Feb 2025 14:59:52+01:00	60	32	0.00043
2	25. Feb 2025 15:00:51+01:00	60	260,854,524	Yes	25. Feb 2025 15:00:51+01:00	60	15	0.00020
3	25. Feb 2025 15:01:51+01:00	60	265,363,705	Yes	25. Feb 2025 15:01:51+01:00	60	10	0.00013
4	25. Feb 2025 15:02:51+01:00	60	264,992,942	Yes	25. Feb 2025 15:02:51+01:00	60	8	0.00011
5	25. Feb 2025 15:03:52+01:00	60	263,142,660	Yes	25. Feb 2025 15:03:51+01:00	60	0	0.00000
Summary		300	n.d.	Yes	n.d.	300	n.d.	n.d.

* Particle concentration ≥ 0.3µm [1/m³] > Minimum raw air concentration [1/m³]

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F14			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Measuring device used:

Particle measuring device	Name	Flow	Next calibration
Raw air	M0494	472.000 [cm³/s]	03. May 2025
Clean air	M0493	472.000 [cm³/s]	03. May 2025

Differential pressure measuring device	Next calibration
M0492	13. May 2025

Dilution stage	Dilution factor	Next calibration
M0555	100	11. Jun 2025

Probe	Measuring notebook
Rund 36mm	VMWIN11MOQLERO

Test Print

Filter test measurement results

Filter type	Visual Inspection OK	Differential pressure [Pa]			Scan / Leak test ok
		Actual	Max.	Result	
supply air filter	n.d.	95.0	500.0	ok	ok

Overall result	O

Measured by: **John, Doe (jdoe)**

Participants: n.d. n.d.

Signature 08. Apr 2025 13:35:56 (UTC)

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F14			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Dynamic measurement

Probe geometry:

Effective width [cm]:	2.55
Height [cm]:	n.d.
Diameter [cm]:	3.60

Parameter scantest

Scan velocity [cm/s]:	5.0
Track overlap [cm]:	5.0
N_a [1]:	0
N_p [1]:	4
P_L [%]:	1.00
Flow raw air [m³/s]:	0.00047200
Minimum raw air concentration [1/m³]:	166,822,368
Scan time calculated [min]:	5

Evaluation scantest

Number of possible leaks:	0

Test Print

Measurement results dynamic measurement

No.	Raw air				Clean air			Penetration rate [%]
	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm [1/m³]	Requirements fulfilled *	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm	
1	25. Feb 2025 15:05:32+01:00	60	263,711,163	Yes	25. Feb 2025 15:05:33+01:00	60	0	0.00000
2	25. Feb 2025 15:06:32+01:00	60	262,538,846	Yes	25. Feb 2025 15:06:32+01:00	60	0	0.00000
3	25. Feb 2025 15:07:32+01:00	60	265,314,270	Yes	25. Feb 2025 15:07:32+01:00	60	0	0.00000
4	25. Feb 2025 15:08:32+01:00	60	265,310,739	Yes	25. Feb 2025 15:08:32+01:00	60	0	0.00000
5	25. Feb 2025 15:09:32+01:00	60	267,531,784	Yes	25. Feb 2025 15:09:32+01:00	60	0	0.00000
Summary		300	n.d.	Yes	n.d.	300	n.d.	n.d.

* Particle concentration ≥ 0.3µm [1/m³] > Minimum raw air concentration [1/m³]

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F15			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Measuring device used:

Particle measuring device	Name	Flow	Next calibration
Raw air	M0494	472.000 [cm³/s]	03. May 2025
Clean air	M0493	472.000 [cm³/s]	03. May 2025

Differential pressure measuring device	Next calibration
M0492	13. May 2025

Dilution stage	Dilution factor	Next calibration
M0555	100	11. Jun 2025

Probe	Measuring notebook
Rund 36mm	VMWIN11MOQLERO

Test Print

Filter test measurement results

Filter type	Visual Inspection OK	Differential pressure [Pa]			Scan / Leak test ok
		Actual	Max.	Result	
supply air filter	n.d.	95.0	500.0	ok	ok

Overall result	O

Measured by: **John, Doe (jdoe)**

Participants: n.d. n.d.

Signature 08. Apr 2025 13:35:56 (UTC)

Protocol sheet

Building:	DEMO Geb01	Room:	DEMO R28	Equipment No.:	
Measurement point:	DEMO F15			Filter class:	H14
Measure. point group:	DEMO Room G01 R28 Filter test				
Description:	Filter system – Integrity test with aerosol challenge				
Start measuring:	25. Feb 2025				

Dynamic measurement

Probe geometry:

Effective width [cm]:	2.55
Height [cm]:	n.d.
Diameter [cm]:	3.60

Parameter scantest

Scan velocity [cm/s]:	5.0
Track overlap [cm]:	5.0
N_a [1]:	0
N_p [1]:	4
P_L [%]:	1.00
Flow raw air [m³/s]:	0.00047200
Minimum raw air concentration [1/m³]:	166,822,368
Scan time calculated [min]:	5

Evaluation scantest

Number of possible leaks:	0

Test Print

Measurement results dynamic measurement

No.	Raw air				Clean air			Penetration rate [%]
	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm [1/m³]	Requirements fulfilled *	Start measuring	Measurement duration [s]	Particle ≥ 0.3µm	
1	25. Feb 2025 15:11:04+01:00	60	259,643,366	Yes	25. Feb 2025 15:11:05+01:00	60	1	0.00001
2	25. Feb 2025 15:12:04+01:00	60	261,500,711	Yes	25. Feb 2025 15:12:05+01:00	60	68	0.00092
3	25. Feb 2025 15:13:04+01:00	60	266,235,880	Yes	25. Feb 2025 15:13:05+01:00	60	0	0.00000
4	25. Feb 2025 15:14:04+01:00	60	264,904,665	Yes	25. Feb 2025 15:14:05+01:00	60	0	0.00000
5	25. Feb 2025 15:15:04+01:00	60	264,194,920	Yes	25. Feb 2025 15:15:05+01:00	60	0	0.00000
Summary		300	n.d.	Yes	n.d.	300	n.d.	n.d.

* Particle concentration ≥ 0.3µm [1/m³] > Minimum raw air concentration [1/m³]

Air Exchange Verification

LUMESS

MAM Cleanroom Measurement

In the following, all times are shown in local time with the corresponding UTC offset.

Print date: 08 Apr 2025 15:06:09 (Europe/Berlin (UTC +2:00))

Test Print

Protocol sheet

Overview of Air Exchange Verification

Master data								Measurement result	Result
Level	Room	Room name	Cleanroom classification	Count OF 1)	Room volume [m³]	ACH technical design 2) [1/h]	Minimum air exchange rate [1/h]	measured air exchange [1/h]	OCRN 3)
Building: DEMO Geb01									
Department: LPF									
200	DEMO R28	Washing area	ISO 7.0	6	161.6	20.0	20.0	20.2	O

*) red: Result not i.O.
1) Total Number of measured outlets
2) Technical design of the room
3) Measured air exchange ≥ Minimum ACH

Signature 08 Apr 2025 13:06:10 (UTC)

Test Print

Protocol sheet

Air Exchange Rate Verification

Building	DEMO Geb01	**Level**	200	**Room**	DEMO R28	**Cleanroom classification**	ISO 7.0

Acceptance criteria	**Minimum ACH**	20.0 [1/h]	**Target air volume**	3232.00 [m³/h]	**Count OF**	6	
Room data	**Area**	46.16 [m²]	**Height**	3.50 [m]	**Volume**	161.6 [m³]	

Measuring device name	Measuring device type	Calibrated until	Absolute measuring device deviation	Relative measuring device deviation [%]
BM_Ext_003	Balometer	04 Nov 2025	0.000	0.000

Test Print

Protocol sheet

Measurement point	Group	Type	Measurement method	Air volume measured [m³/h]	Percentage Supply air [%]	Supply air volume [m³/h]	Start measuring:	Measurer *Participants*	Tolerance criterion Deviation mean value of the group	Deviation Group mean [%]	Comment measurer
Measure. point group:		DEMO Room G01 R28 Air Exchange Rate									
DEMO R28-F10	A	Zuluft	Air FLow Hood	537.0	100	537.0	06 Apr 2025 13:03:17 +02:00	jpublic	≥ 0%	-1.5	
DEMO R28-F11	A	Zuluft	Air FLow Hood	582.1	100	582.1	06 Apr 2025 13:02:58 +02:00	jpublic	≥ 0%	6.8	
DEMO R28-F12	A	Zuluft	Air FLow Hood	523.0	100	523.0	06 Apr 2025 13:03:07 +02:00	jpublic	≥ 0%	-4.1	
DEMO R28-F13	A	Zuluft	Air FLow Hood	604.3	100	604.3	06 Apr 2025 13:02:47 +02:00	jpublic	≥ 0%	10.9	
DEMO R28-F14	A	Zuluft	Air FLow Hood	483.0	100	483.0	06 Apr 2025 13:02:36 +02:00	jpublic	≥ 0%	-11.4	
DEMO R28-F15	A	Zuluft	Air FLow Hood	541.0	100	541.0	06 Apr 2025 13:02:30 +02:00	jpublic	≥ 0%	-0.8	
Summary				**3.270.4**		**3.270.4**					

Group	Mean air volume per outlet [m³/h]
Measure. point group:	DEMO Room G01 R28 Air Exchange Rate
A	545.1

Test Print

Protocol sheet

Level	Room	ACH technical design [1/h] **)	ACH technical measured [1/h] **)	Minimum air exchange rate [1/h]	Measured air exchange [1/h]	Deviation [%]	Result OCRN *)
Department				LPF			
200	DEMO R28	20.0	20.2	20.0	20.2	1.00	O
*) red: Result not i.O.							

Measured by: **Public, Jane** **(jpublic)**

Participants: n.d. n.d.