

Preventive Maintenance Order



Work Order: 900786 (Recertification acc. SOP M944)

Asset: EQU001 (Equnr. KT)

Site|Bldg.Room: GER R02

Partner AR: m.muenzer

Maint. Work Ctr.:

Maint. Plan / Item: WARPL0001 / 4440099925

Page 1 of 1

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

Printed: 11 Apr 2025 15:12:54 +02:00

Begin of Measurements: 10 Apr 2025 14:56:18+02:00

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

Guideline Specifications:

Asset Status

Asset available ☒ YES ☐ NO ☐ n.d.

Operation	Short-Text	Package
0010	n.a.	PA

Document(s)

n.d. n.d.

Operation(s)

Number	Short-Text and Long-Text	Result ¹⁾			
		O	C	R	N
0010	n.a.			X	

Conclusion:

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

Action limit exceeded / Leak detected / not carried out

Comment available

Comment from professional examiner on WO

Remarks: ☒ YES ☐ NO

Completed by:

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

Approved by:

Mike Boss, mboss, 11 Apr 2025 12:32:17 UTC+02:00

Name, Login, Date

Comment: Close workorder as scheduled

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

PARMESS

MAM Cleanroom Measurement

Print date: 11 Apr 2025 15:12:54

Order-Configuration Number: 900786

SAP-Group:

Name:

MKLTST Demo MPG Filter Scan-/Leaktest

Type:

900 - Others

Description:

Demo Filtersystem MPG for showcasing scan- and leakstests

Maint. Item:

4440099925

Measurement point group (Measurement type)	Building	Room	OCRN Group	Equipment No.	Measurement Point	OCRN Measurem. Point
Demo MPG Filter Scan-/Leaktest (Filter Test)	MKLTS T	MKLTST_ R02	R	Testequipment	MP-Filter01	C

DEHS-Test according to DIN EN 14644-3

PARMESS

MAM Cleanroom Measurement



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

Print date: 10. Apr 2025 (Europe/Berlin (UTC +2:00))

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Protocol sheet - Repeated measurement no. 1

Building: MKLTST Room: MKLTST_R02 Equipment No.: Testequipment
Measurement point: MP-Filter01 Filter class: H14
Measure. point group: Demo MPG Filter Scan-/Leaktest
Description: Demo measurement point group for showcasing scan- and leaktests
Begin measurement: 10. Apr 2025

Measuring device used:

Particle measuring device	Name	Flow	Next calibration
Raw air	SIM-SEQ1	472.000 [cm ³ /s]	30. Dec 2050
Clean air	SIM-SEQ2	472.000 [cm ³ /s]	30. Dec 2050

Differential pressure measuring device	Next calibration
DPMD01	02. Apr 2029

Dilution stage	Dilution factor	Next calibration
DS271	100	01. Apr 2026

Probe	Measuring notebook
Probe09	VMWIN11MOQLERO

Filter test measurement results

Filter type	Visual Inspection OK	Differential pressure [Pa]			Scan / Leak test ok
		Actual	Max.	Result	
supply air filter	ok	50.0	500.0	ok	ok

Overall result	R	includes the result(s) of the repeated measurement(s)
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Measured by: John, Doe (jdoe)

Participants: n.d. n.d.

DEHS-Test according to DIN EN 14644-3

PARMESS

MAM Cleanroom Measurement



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

Print date: 10. Apr 2025 (Europe/Berlin (UTC +2:00))

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Protocol sheet - Repeated measurement no. 1

Building:	MKLTST	Room:	MKLTST_R02	Equipment No.:	Testequipment
Measurement point:	MP-Filter01	Filter class:	H14		
Measure. point group:	Demo MPG Filter Scan-/Leaktest				
Description:	Demo measurement point group for showcasing scan- and leaktests				
Begin measurement:	10. Apr 2025				

Signature for: Filter No.: MP-Filter01

Login: tadmin Name: Tom Administrator

Date: 10. Apr 2025 16:05:01 Comment: Following the resolution of the filter malfunction, the system has been reverified and is now fully suitable for production use.

Test Print

DEHS-Test according to DIN EN 14644-3

PARMESS

MAM Cleanroom Measurement



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Print date: 10. Apr 2025 (Europe/Berlin (UTC +2:00))

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Protocol sheet - Repeated measurement no. 1

Building: MKLTST Room: MKLTST_R02 Equipment No.: Testequipment
Measurement point: MP-Filter01 Filter class: H14
Measure. point group: Demo MPG Filter Scan-/Leaktest
Description: Demo measurement point group for showcasing scan- and leaktests
Begin measurement: 10. Apr 2025

Dynamic measurement

Probe geometry:

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

Parameter scantest

Scan velocity [cm/s]: 8.0
Track overlap [cm]: 1.0
 N_a [1]: 0
 N_p [1]: 4
 P_L [%]: 0.01
Flow raw air [m³/s]: 0.00047200
Minimum raw air concentration [1/m³]: 266,915,788
Scan time calculated [min]: 4

Evaluation scantest

Number of possible leaks: 0

Measurement results dynamic measurement

No.	Raw air				Clean air			Penetration rate [%]
	Begin measurement	Measurement duration [s]	Particle $\geq 0.3\mu\text{m}$ [1/m ³]	Requirements fulfilled *	Begin measurement	Measurement duration [s]	Particle $\geq 0.3\mu\text{m}$	
1	10. Apr 2025 15:25:40+02:00	60	310,192,400	Yes	10. Apr 2025 15:25:39+02:00	60	1,208	0.00039
2	10. Apr 2025 15:26:12+02:00	60	322,073,500	Yes	10. Apr 2025 15:25:58+02:00	60	913	0.00028
3	10. Apr 2025 15:26:52+02:00	60	318,720,100	Yes	10. Apr 2025 15:26:31+02:00	60	642	0.00020
4	10. Apr 2025 15:27:03+02:00	60	316,255,300	Yes	10. Apr 2025 15:26:41+02:00	60	804	0.00025
Summary		240	n.d.	Yes	n.d.	240	n.d.	n.d.

* Particle concentration $\geq 0.3\mu\text{m}$ [1/m³] > Minimum raw air concentration [1/m³]

DEHS-Test according to DIN EN 14644-3

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MAM Cleanroom Measurement



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Protocol sheet

Building: MKLTST Room: MKLTST_R02 Equipment No.: Testequipment
Measurement point: MP-Filter01 Filter class: H14
Measure. point group: Demo MPG Filter Scan-/Leaktest
Description: Demo measurement point group for showcasing scan- and leaktests
Begin measurement: 10. Apr 2025

Measuring device used:

Particle measuring device	Name	Flow	Next calibration
Raw air	SIM-SEQ1	472.000 [cm ³ /s]	30. Dec 2050
Clean air	SIM-SEQ2	472.000 [cm ³ /s]	30. Dec 2050

Differential pressure measuring device	Next calibration
DPMD01	02. Apr 2029

Dilution stage	Dilution factor	Next calibration
DS271	100	01. Apr 2026

Probe	Measuring notebook
Probe09	VMWIN11MOQLERO

Filter test measurement results

Filter type	Visual Inspection OK	Differential pressure [Pa]			Scan / Leak test ok
		Actual	Max.	Result	
supply air filter	ok	50.0	500.0	ok	not ok

Overall result	C
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Measured by: John, Doe (jdoe)

Participants: n.d. n.d.

Comment filter test: Single filter did not pass the retention requirements

DEHS-Test according to DIN EN 14644-3

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MAM Cleanroom Measurement



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Protocol sheet

Building:	MKLTST	Room:	MKLTST_R02	Equipment No.:	Testequipment
Measurement point:	MP-Filter01	Filter class:	H14		
Measure. point group:	Demo MPG Filter Scan-/Leaktest				
Description:	Demo measurement point group for showcasing scan- and leaktests				
Begin measurement:	10. Apr 2025				

Signature for: Filter No.: MP-Filter01

Login: tadmin Name: Tom Administrator

Date: 10. Apr 2025 15:20:11 Comment: Single filter did not pass the retention requirements, the filter must be exchanged and remeasured. Initiate Low level quality investigation.

Test Print

DEHS-Test according to DIN EN 14644-3

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MAM Cleanroom Measurement



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Measure. point group: Demo MPG Filter Scan-/Leaktest
Description: Demo measurement point group for showcasing scan- and leaktests
Begin measurement: 10. Apr 2025

Dynamic measurement

Probe geometry:

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

Parameter scantest

Scan velocity [cm/s]: 8.0
Track overlap [cm]: 1.0
 N_a [1]: 0
 N_p [1]: 4
 P_L [%]: 0.01
Flow raw air [m³/s]: 0.00047200
Minimum raw air concentration [1/m³]: 266,915,788
Scan time calculated [min]: 4

Evaluation scantest

Number of possible leaks: 1

Measurement results dynamic measurement

No.	Raw air				Clean air			Penetration rate [%]
	Begin measurement	Measurement duration [s]	Particle $\geq 0.3\mu\text{m}$ [1/m ³]	Requirements fulfilled *	Begin measurement	Measurement duration [s]	Particle $\geq 0.3\mu\text{m}$	
1	10. Apr 2025 15:00:23+02:00	60	301,887,100	Yes	10. Apr 2025 15:00:23+02:00	60	11,275	0.00373
2	10. Apr 2025 15:01:23+02:00	60	320,157,200	Yes	10. Apr 2025 15:01:23+02:00	60	49,280	0.01539
3	10. Apr 2025 15:02:23+02:00	60	318,672,200	Yes	10. Apr 2025 15:02:23+02:00	60	1,092	0.00034
4	10. Apr 2025 15:03:23+02:00	60	313,630,400	Yes	10. Apr 2025 15:03:23+02:00	60	12,872	0.00410
Summary		240	n.d.	Yes	n.d.	240	n.d.	n.d.

* Particle concentration $\geq 0.3\mu\text{m}$ [1/m³] > Minimum raw air concentration [1/m³]

DEHS-Test according to DIN EN 14644-3

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MAM Cleanroom Measurement



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

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Protocol sheet

Building: MKLTST Room: MKLTST_R02 Equipment No.: Testequipment
Measurement point: MP-Filter01 Filter class: H14
Measure. point group: Demo MPG Filter Scan-/Leaktest
Description: Demo measurement point group for showcasing scan- and leaktests
Begin measurement: 10. Apr 2025

Static measurement

Possible leaks

No.	x-coordinate [cm]	y-coordinate [cm]
1	295.0	310.0

Measurement results static measurement

Max. allowable total penetration [%]: 0.01

			Raw air		Clean air			Result
Leak No.	Sample No.	Begin measurement	Measurement duration [s]	Particle $\geq 0,3\mu\text{m}$ [1/m³]	Measurement duration [s]	Acceptance particle count N_{ar} :	Counted particles $\geq 0,3\mu\text{m}$ [1]	OCRN
1	1	10. Apr 2025 15:07:24+02:00	60	305,896,700	60	807	47,226	C
1	2	10. Apr 2025 15:08:24+02:00	60	342,517,600	60	907	28,109	C
1	3	10. Apr 2025 15:09:24+02:00	60	297,063,900	60	783	174,092	C