

# Commissioning Workshop

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# What is commissioning?

In construction and industrial projects, commissioning involves testing and verification to confirm all systems operate correctly before handover to the owner.

**Purpose:**

To ensure that all systems are installed, tested, and operating according to the design specifications and the owner's requirements.

**Process:**

This involves integrated testing of individual components, subsystems, and the entire facility, ensuring everything functions as intended.

**Outcome:**

A completed facility that is safe, efficient, and ready for operation and maintenance by the owner's team.

# HSE requirement...

## PUWER (Provision and Use of Work Equipment)

### Regulation 4(1)

53 Equipment must be suitable for the work it is provided for, and must be used in accordance with the instructions. If work equipment is used in a way that is not intended, the user must be informed of the risks involved.

Th... firming that...

Equipment functions correctly,

meets **all safety standards**, and

- is ready for safe operation without posing any foreseeable risk

Its not all about COSHH


# REAL Example...

TP No.		Reference	Duct Size	Cross Sectional Area	Transport Velocity	Static Pressure	Volume Flow
TP1		Main Duct	Ø450mm	0.15906m²	10.56m/s	-111Pa	1.68m³/s

Company	Tested by	Job No:	Date Commissioned:
		24,932	4 <sup>th</sup> July 2025

System Location:	System Ref:	Sheet No:
Extruder Line	Extruder 6 Extraction	001

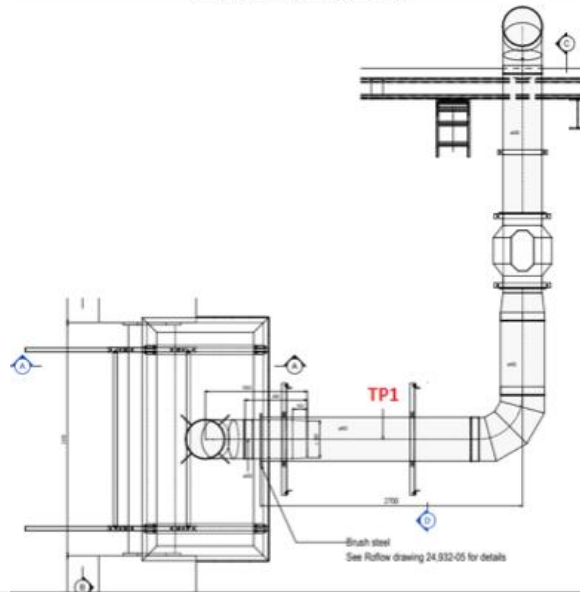
Fan Details:	Test Equipment	Comments:
Type: Ø450 Axial Manufacturer: Roflow Motor Power: 0.75kW Motor Speed: 1410RPM Motor Frequency: 50Hz	Type: Pitot Tube Manometer Manufacturer: Fluke Model: 922  Type: Thermo Vane Anemometer Manufacturer: RS Pro Model: AVM-01	-Main readings were taken over several points and averaged with a  -Fan motor set to 50Hz



Page 1 of 4

# REAL Example...

TEST POINT REFERENCE



PICTURES ATTACHED



# REAL Example...

Assessment Undertaken By			
Name	Position	Signed	Date
[REDACTED]	Maintenance & Service Manager	[REDACTED]	4 <sup>th</sup> July 2025

Report Prepared By			
Name	Position	Signed	Date
[REDACTED]	Maintenance & Service Manager	[REDACTED]	4 <sup>th</sup> July 2025

Report Checked and Authorised By			
Name	Position	Signed	Date
[REDACTED]	Senior Contracts Manager	[REDACTED]	4 <sup>th</sup> July 2025

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# Key feature of a commissioning report:

identification of the hazardous substance and /or the appropriate control WEL (“workplace exposure limit”) or OEL (“occupational exposure limit”)

that the LEV matches the quoted specification (if available) indicating that it has been correctly installed

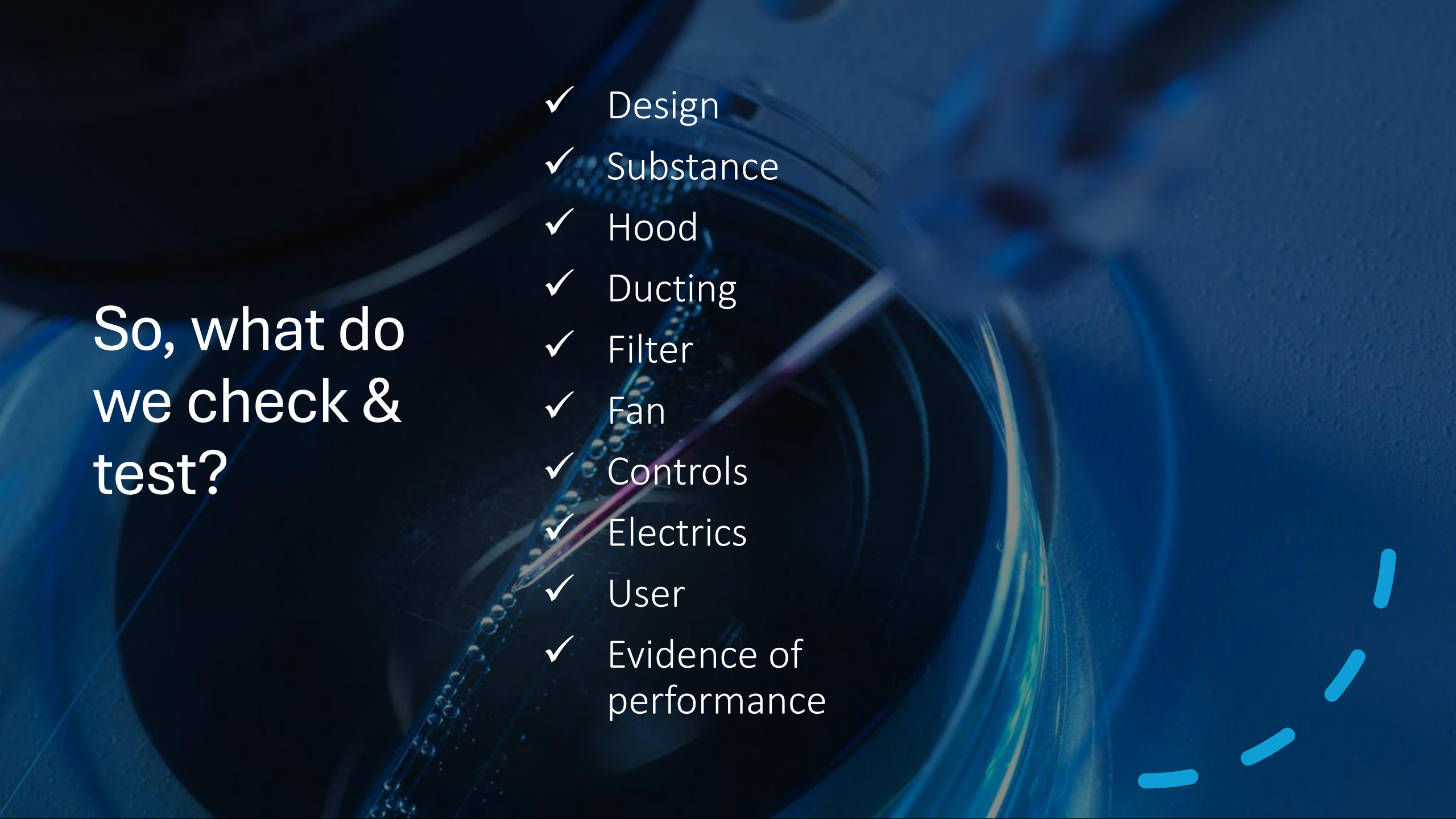
should be able to show it is being used correctly

demonstrates if adequately controlling contaminant clouds i.e. indication that the LEV controls exposure to the hazardous substance to below the WEL/OEL and/or achieves ALARP etc.


a facility to highlight any modifications needed to improve control

Identifies the benchmarks for comparison during routine thorough examination and tests (TEt's).

identify appropriate maintenance program for the routine checks that the operators should be performing and recording



So, what do  
we check &  
test?

- ✓ Design
  - ✓ Substance
  - ✓ Hood
  - ✓ Ducting
  - ✓ Filter
  - ✓ Fan
  - ✓ Controls
  - ✓ Electrics
  - ✓ User
  - ✓ Evidence of performance
- 



# Design

- Description of the process to be controlled
- What is exposure levels with no controls?
- Benchmarking
- Details of the substances to be controlled
- DSEAR Assessment
- Design Drawings
  - General arrangement
  - Schematic
  - Sizing
  - Ducting
  - Fan
  - Filter
- use at any given time
- Plant manufacturers data
  - Installation manuals
- How the system is to be used
- Number of points to be in

# Substance

- What is being used?
  - Combination of substances?
- How hazardous?
  - WEL / OEL or ALARP
- Is it...
  - Dry/Sticky/Wet
  - explosive or flammable/highly flammable
  - Corrosive
- Amount
- Concentration
- Form

# Hoods

- Construction
- Usage / positioning
- Air flow indicators
- Velocity
- Smoke control
- Dust lamp – surrogate substance
- DSEAR zoning
  - ATEX Category

# Ducting

- Dampers – pre-set or fully open
- Balancing...
  - Method
  - How long does this take
- Test points?
- Inspection hatches
- Support system
  - Is it adequate
  - Compliant with TR50
- Installation – compliance with DW144 and DW154
- Fire dampers
  - Correct installation – DW145
  - Drop test
- DSEAR zone
  - Earth bonding

# Filter

- Type – is it correct
    - Efficiency – dust cake
    - Alarms / warning devices
  - Fit
  - Pressure gauge
    - Is one fitted
    - does it work
  - Cleaning mechanism – does it work
  - Noise - could it be an issue
  - DSEAR zones
    - ATEX ratings
    - Can you access everything (are you COMPEX qualified?)
  - Explosion venting
    - Where
      - What is substance bursting pressure ( $P_{MAX}$ )
  - What is the size of flame
  - Power of explosion? Will it cause damage?
- Rotary valve
    - Correct type
    - ATEX rating
    - Does it prevent spread of explosion
  - Duct bursting pressure – is duct suitable
  - Collection
    - How is it collected
    - How is the collection device emptied/changed
    - Is there a risk to the operator during his process

# Fan

- Air volume flow rate & pressure
- Direction of rotation
- RPM
  - Belt drive
    - Pulleys sizes
    - belt tension
- Noise
- Vibration
- Electrics
  - Amps

# Controls

- How?
  - On / off
  - Automatic
    - Description of how
    - Set points
- Indication its working
- User training

# Electrics

- Electrical installation certificate
- Connections
- Amps



# User

- Can they use the system correctly?
- Training
- User checks
  - What?
  - Where?
  - When?
  - Who do we report to?
- Alarms
- Consumables will they need

# Evidence of performance

- Smoke test
- Dust lamp
- Air monitoring
  - DRAM
    - Methodology
  - Static
  - Personal (are you qualified?)

Finally...

**Don't forget to do a  
schematic &**

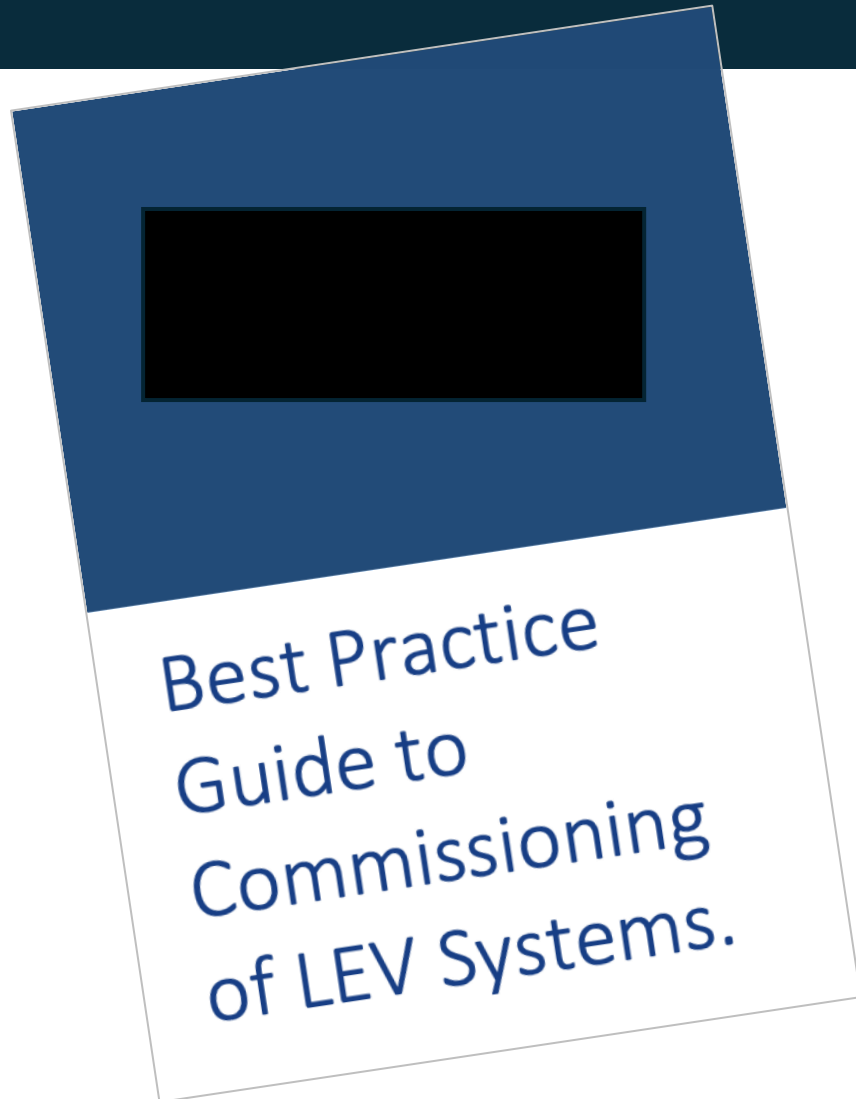
**set BENCHMARKS!**

Finally...

**Statement of  
compliance**

**Or NOT**

# Industry minimum standard?



## Local Exhaust Ventilation (LEV) Commissioning Report

System ID:  
Date of Inspection:  
Report Reference:

Summary of the Assessment of Control

**Satisfactory**

**Unsatisfactory**

System ID:  
Date of Inspection:  
Report Reference:

## Table of Contents

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System ID:  
Date of Inspection:  
Report Reference:

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**Report Reference:**

The Water System has been subjected to a commissioning procedure, including a thorough examination and test to ensure it can provide adequate control to comply with the Control of Substances Hazardous to Health (COSHH) Regulations 2002 (as amended). The outcome of this assessment is that the system has been deemed satisfactory. Un satisfactory items are some areas that require attention to improve the system or bring the system into compliance. These are listed below in order of priority.

## 2 Clients Details

Responsible  
Person:  
Contact details:

Conditions during test:

Serial number: \_\_\_\_\_ Asset number: \_\_\_\_\_  
Brief description of system: \_\_\_\_\_  
(what to be controlled, how to be controlled, number of hands to be used at any time, system details)

Description of process to be controlled:  
(including: type of tool/equipment/machinery, frequency of process, duration of process, quantities of substances, operating temperatures, other control measures to be used)

Hazardous substance to be controlled:  
(including: substance name, WEL, quantity being used, physical form, corrosivity, vapour density)

Report Reference:

I can confirm that the system addressed by this report has been carried out in full accordance with C25 H1 Regulation 9 and can be used as the data required for a comparison for ongoing Tax Reports.

Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Contact details:

The objective is formally to witness, on behalf of the client or his/her representative, the degree to which the requirements of the commissioning specification have been met.

The witnessing agent should:

1. be satisfied that, throughout the installation and balancing process, the requirements of the commissioning specification have been met
2. check the flow rate at any selected flow measurement point using a similar instrument and compare with the data recorded by the commissioning engineer and with the designer's requirements, which should include any permitted tolerance
3. check performance of all plant and systems
4. visually inspect any part of the system to ensure that certification is correct
5. countersign and endorse as necessary the certificate of the appointed commissioning specialist verifying that systems have been balanced in accordance with the specification requirements
6. where required, complete a separate witnessing certificate confirming satisfaction, one copy of which is handed to the commissioning specialist
7. check correct operation of the control system
8. check the correct operation of life safety systems.
9. check the system is in a clean acceptable condition.

The system performance, and effective control of the hazardous substance (or surrogate), was demonstrated by the above in the presence of:

Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Contact details:

System ID:  
Date of Inspection:  
Report Reference:

7 Additional Plant Information

Frequency of testing: (Tick one)	Monthly	6 monthly	14 monthly	Other (specify)
Evidence of: (Tick)	COSHH Reg 6 Risk Assessment	DSFAR Reg 5 Risk Assessment	Material Safety Data Sheets	
Evidence of: (Tick)	Design Specification	Logbook	O&M Manual	User training records

8 DSEAR & ATEX

Is the substance:	Flammable?	Y/N	Explosive?	Y/N
Is the generation of an explosive atmosphere: (Tick one)	Present		Likely	Unlikely
DSEAR Zoning:	Work area		Hood	Plant
Lower Explosive Limit:			Upper Explosive Limit:	
Explosion vent panel: Is one required?	Y/N		Is one fitted?	Y/N
Is it venting to a safe place?	Y/N		Is it in good condition?	Y/N
Explosion non-return damper: Is one required?	Y/N		Is one fitted?	Y/N
Is the connecting ductwork suitable?	Y/N			

9 Conclusions and Comments

- 1
- 2
- 3
- 4
- 5

System ID:  
Date of Inspection:  
Report Reference:

10 Drawings  
10.1 Schematic

Line schematic to show key components of the system.

Notes/Comments:



System ID:  
Date of Inspection:  
Report Reference:

10.2 General Arrangement

Dimensioned drawing of the system to include location of test points and DSFAR exclusion zones.

Notes/Comments:

System ID:  
Date of Inspection:  
Report Reference:

11 Photographs

Photo

Description/Comments

1

2

3

4

5

System ID:  
Date of Inspection:  
Report Reference:

12 Assessment

12.1 Installation						
Element of system	Component check list completed (see Appendix A)	Installed in accordance with the system design? (Tick)	Installed in accordance with manufacturer's instructions? (Tick)	Comply with Regulations? (Tick)	Comply with industry standards and best practice? (Tick)	Comments
Hoods						
Air flow indication devices						
Ducting						
Test points						
Inspection panels						
Balancing dampers						
Filters						
Pressure gauge to filters						
Air mover						
Discharge arrangement						
Fixings and support systems						
Electrical installation						
On/off controls						
Earth bonding						
Waste collection						

System ID:  
Date of Inspection:  
Report Reference:

12.2 Hoods								
Hood Ref	Type Receiving   Capture   Partial   Full Enclosure   Other (specify)	Dimensions	Measured		Air volume flowrate	Future Benchmark		Test kit used
			Static pressure	Face Velocity		Velocity	Static Pressure	
		(m)	(Pa)	(m/sec)	(m³/sec)	(m/sec)	(Pa)	Hotwire / Rotating Vane

Hood diversity of in use at any given time.

Statement on effective capture zone: The contaminant is / is not released in the effective capture zone of the hood.

Method of test: Smoke release | Dust Lamp | Other (specify)  
(Provide photographic evidence)

Notes/comments:  
e.g. installed in accordance with design,  
appropriateness, usage, effectiveness of  
controls, air flow indication devices etc.

12.3 Capture hoods		Is appropriate?		YES (complete below)		Alerts	NO (move to next section)	NO (move to next section)
Hood Ref	Size	Capture velocity	Capture distance	Is working zone in capture zone?		Comments		
	(m x m)	(m/sec)	(m)	Yes/No				

12.4 Clearance time		Is appropriate?		YES (complete below)		NO (move to next section)	
Hood Ref	Size	Air volume flow rate	Clearance time	Comments			
	(m x m)	(m³/sec)	(minutes)				

12.5 Filter		Is a filter fitted?	YES (complete below)	NO (move to next section)
Visual assessment				
Filter type:		Manufacturer		
Model:		Serial number		
Filter media type		Filtration area (m <sup>2</sup> )		

System ID:

Date of Inspection:

Report Reference:

Antistatic	Condition of filter media
Air Return to working environment (if yes see below)	Filter Monitoring e.g. Alarms
Cleaning device type (compressed air/shaker/water pump etc.)	Condition
Duration of cleaning period	Frequency of cleaning
ATEX Rating	Explosion Relief
Earth bonding	Explosion relief location
Explosion non-return damper	High pressure ducting (between plant and non return damper)

12.6 Quantitative assessment			
Inlet Static pressure (Pa)		Outlet Static (Pa)	
Differential Pressure (Pa)		Volume Airflow rate (m³/hr)	
Contaminant Breakthrough		Filter efficiency	
Notes/comments: e.g. installed in accordance with manufacturer's design, pressure gauges fitted either side of filter, noise levels, vibration, corrosion etc.			

12.7 HEPA Filter	Is the air returned to the working environment?	YES (complete below)		NO (move to next section)	
	Is a HEPA filter fitted?	YES (complete below)		NO (move to next section)	
Visual assessment					
Filter type		Manufacturer			
Model		Serial number			
Filter media type		Filtration area (m²)			
Condition of filter media		Filter Monitoring e.g. Alarms			
Has it been tested to ISO14644-3		Test results			
Date of last test:		Date of next test (minimum 6 to 12 months)			

12.8 Quantitative assessment			
Inlet Static pressure (Pa)		Outlet Static (Pa)	
Differential Pressure (Pa)		Volume Airflow rate (m³/hr)	
Contaminant Breakthrough		Filter efficiency	
Notes/comments: e.g. installed in accordance with manufacturer's design, pressure gauges fitted either side of filter, compliance to ISO14644-3 etc.			

System ID:

Date of Inspection:

Report Reference:

12.9 Fan			
Visual assessment			
Fan type		Type of impeller	
Manufacturer		Impeller plate RPM	
Model		Impeller direction of rotation	
Fan Serial number		Fan Monitoring - Alarms	
ATEX Rating		Fan size	
Direction of Rotation			

12.10 Quantitative assessment			
Static pressure:		Fan Volume Airflow rate (m³/hr)	
Inlet (Pa)		Total pressure (Pa)	
Outlet (Pa)			
Notes/comments: e.g. installed in accordance with manufacturer's design. Are pressure gauges fitted either side of fan, noise levels, vibration, corrosion etc.			

12.11 Fan Drive type	Direct		Belt	
Fan pulley size			No. of belts	
Motor pulley size			Belt type	
Pulley centres			Belt tension	
Measured fan RPM			Measured motor RPM	
Notes/comments:				

12.12 Motor	
Electrical supply – Voltage	Motor rating (kW)
Manufacturer	Motor Current Plated (Amps)
Model	Motor Current Measured (Amps)
Motor Serial number	Motor plate RPM
ATEX Rating	
Notes/comments:	

12.13 Controls	
On/Off or Variable Speed Drive	Manual / Automatic
Speed setting	Alarms / Warning devices fitted
Electrical compliance (evidence of certification to BS 5782?)	Condition

System ID:  
Date of Inspection:  
Report Reference:  
Notes/comments:

12.14 Other  
Fire suppression system

Notes/comments:

12.15 Ducting			
Visual assessment			
Material		Condition – inside	
Balancing dampers		Condition – outside	
Flexible ducting condition		Inspection hatches	
Earth bonding		Explosion hatches	
Notes/comments: e.g. installed in accordance with design			

12.16 Quantitative assessment							
Test point Ref	Diameter	Measured Static pressure	Measured Transport Velocity	Future Benchmark		Balancing damper position	Comment  <i>e.g. Potential for blockage, Ease of access, suitability of test point etc.</i>
	(m)	(Pa)	(m/sec)	Velocity (m/sec)	Static Pressure (Pa)	% closed	

12.17 Discharge Arrangement

Type	Location
Stack height	Stack discharge velocity
Notes/comments: e.g. effectiveness, risk of recirculation, effect on neighbours, source of make up air etc.	

12.18 Air sampling results	Has air monitoring been conducted?	YES (complete below)		NO (move to next section)	
Report reference:		Date of report			
Notes/comments:					

System ID:  
Date of Inspection:  
Report Reference:

13 Calibration Certificates


Hotwire Anemometer	Rotating Vane Anemometer
--------------------	--------------------------

Manometer	Tachometer
-----------	------------

Other:.....	Other:.....
-------------	-------------

Report Reference:

## 14 Appendix A – Design information checklist

I. AIR DISTRIBUTION SYSTEM - DESIGN INFORMATION CHECKLIST		
Client:		
Project:		
System:		
Check that the design documentation includes:		✓/X Comments / Follow-up references
<b>System information</b>		
1. Description of system operation		1.
2. Drawing showing air distribution system layout		2.
3. Numbering system for all main ducts and terminals		3.
4. Location of dampers and flow measuring positions		4.
5. Fan characteristic curves for each fan duty		5.
6. Controls schematic and description of operation		6.
<b>Schematic drawings incorporating:</b>		
7. Volumetric flow rates and cross sectional areas at:	* supply fan	7.
8.	* extract fan	8.
9.	* air handling units	9.
10.	* main ducts	10.
11.	* branch ducts	11.
12.	* sub-branches	12.
13.	* terminals	13.
14. Static pressure loss:	* filters	14.
15.	* cooling batteries	15.
16.	* heating batteries	16.
17.	* air washers	17.
18.	* silencers	18.
<b>Wiring diagrams covering</b>		
19. System		19.
20. Method of operation		20.
21. Fans		21.
22. Controls		22.
23. Interlock arrangements		23.
24. Fuse ratings		24.
25. Design times for staged starting and motor run up control		25.
26. Voltages for electrostatic filters		26.
27. Design times for staged starting and motor run up control		27.
28. Design values for reduced voltage starting or speed control		28.
<b>Filters</b>		
29. * Identity of filter media		29.
30. * Tolerances on air velocity distribution across electrostatic filters		30.
<b>Fans</b>		
31. * Clearances for fan impeller		31.
32. Static deflection at vibration mountings		32.
33. Grade of lubricant for fan and fan bearings		33.
Date: / /	Engineer:	Approved by:
* These items will sometimes be the installer's responsibility		Sheet: /

\* These items will sometimes be the installer's responsibility

Report Reference:

## 15 Appendix A – Filter

[illegible]

**Report Reference:**

System:		Location:		HC-1:
Service:		Manufacturer:		AC-1:
Drawing:		Certification:		DATE:
Supplier:		Classification:		
MODEL No.:	SERIAL No.:		TYPE:	

CHECK	CHECK DESCRIPTION	STATUS	INIT.	DATE
1	Check all parts against shipping list and purchase order. Note missing or damaged parts below.			
2	Verify nameplate data with specifications and vendor information.			
3	Verify physical characteristics agree with specifications and vendor drawings (rotation, discharge, materials of construction, etc.)			
4	Verify correct type and size of fan wheel is installed per vendors data sheets. Make certain the wheel if of correct rotation and not installed backwards.			
5	Check for physical damage, fan casing and wheel cracks, defects and welding purity. Check interior for debris.			
6	Verify drain(s), access door(s), heat stingers, shaft/bearing guards, belt guard(s) are provided per specification.			
7	Verify that shaft turns freely, fan wheel does not rub or wobble, belts do not contact guard. Rotate by hand not less than 5 full revolutions.			
8	Verify that all grease fittings are extended external to guarding. Fittings must be easily accessible.			
9	Verify that there is a tachometer access hole in belt guard. Hole diameter must not be less than Ø20mm ("N").			
10	Verify that the fan wheel hub key is in place and set screws are tight. Verify that drive sheave/pulley key is in place and set screws are tight.			
11	Check fan wheel-to-inlet clearance against manufacturers specs.			
12	Verify that all motor bearings are correctly lubricated.			

Notes and comments:

	Completed By:	Approved By:	Accepted By:	
Company:				
Signature:				
Name:				
Date:				

Report Reference:

System:	Location:	HC 1:
Service:	Manufacturer:	AC 1:
Drawing:	Certification:	DATE:
Supplier:	Classification:	
MODEL No.	SERIAL No.:	TYPE:

CHECK	CHECK DESCRIPTION	STATUS	INIT.	DATE
13	Verify that fan base is secure per specifications and that unit is level.			
14	If vibration isolators are specified, check that they are installed for uniform deflection as per design.			
15	Belt drive: check proper components; check all fan shaft bearing mounts are secure.			
16	Direct drive: verify mounting and alignment per coupling manufacturer instructions.			
17	Belt drive: check sheave/pulley alignment. Axial alignment shall not exceed 2.5mm per meter (1/32" per foot) of motor / shaft centre-centre distance.			
18	Verify that belt, shaft and coupling guards are installed and secure.			
19	Verify that all duct connections are not binding duct to fan. Verify that flexible connections are built and installed to specifications. Verify alignment of fan and duct.			
20	Check any inlet and outlet dampers for correct installation. Dampers must be free to operate over the desired range.			
21	Verify that variable inlet valve damper is installed with blades in proper alignment. As blades close they must cause air to spin in the same direction as the fan wheel.			
22	Verify the motor rotation will provide proper fan rotation.			
23	Verify the location of local disconnect and motor controls are per specifications and are weatherproof where required.			
24	Verify the fan is properly grounded.			

Notes and comments:

	Completed By:	Approved By:	Accepted By:	
Company:				
Signature:				
Name:				
Date:				

Report Reference:

[illegible]

**Report Reference:**

## 17 Appendix A – Hoods

System:		Location:		HC-1:	
Service:		Manufacturer:		AC-1:	
Drawing:		Certification:		DATE:	
Supplier:		Classification:			
MODEL No.		SERIAL No.:		TYPE:	

CHECK	CHECK DESCRIPTION	STATUS	INIT.	DATE
1	All shipping stops, bracing and packaging removed.			
2	Unit installed according to specification in correct location, orientation, airflow direction and adequately supported.			
3	Unit and all associated equipment undamaged, clean and in good condition with all components secure.			
4	Connections to ductwork secure, tightened with gasket in place and visually airtight.			
5	Balancing damper fitted and left in open state.			
6	Non-sparking features provided.			
7	Adequate static earth bonding fitted.			
8	Airflow indication devices fitted and operating within correct range.			
9				
10				
11				
12				

**Notes and comments:**

	Completed By:	Approved By:	Accepted By:	
Company:				
Signature:				
Name:				
Date:				

System ID:

Date of Inspection:

Report Reference:

18 Appendix A – Ducting

System:				Location:				HC-1:			
Service:				Manufacturer:				AC-1:			
Drawing:				Certification:				DATE:			
Supplier:				Classification:							
MODEL No:				SERIAL No.:				TYPE:			
CHECK	CHECK DESCRIPTION							STATUS	INIT.	DATE	
1	All packaging removed.										
2	Ducting installed according to specification in correct location and adequately supported.										
3	All ducting components are undamaged, clean and in good condition with all secure.										
4	Connections to ductwork secure, tightened with gasket in place and visually airtight.										
5	Control damper fitted (if required) functional and left in open state.										
6	Balancing dampers fitted and left in open state.										
7	Non sparking features provided.										
8	Earth bonding (if required) in place and adequate.										
9	Sufficient leak proof access panels installed.										
10											
11											
12											
Notes and/comments:											
	Completed By:	Approved By:	Accepted By:								
Company:											
Signature:											
Name:											
Date:											

System ID:

Date of Inspection:

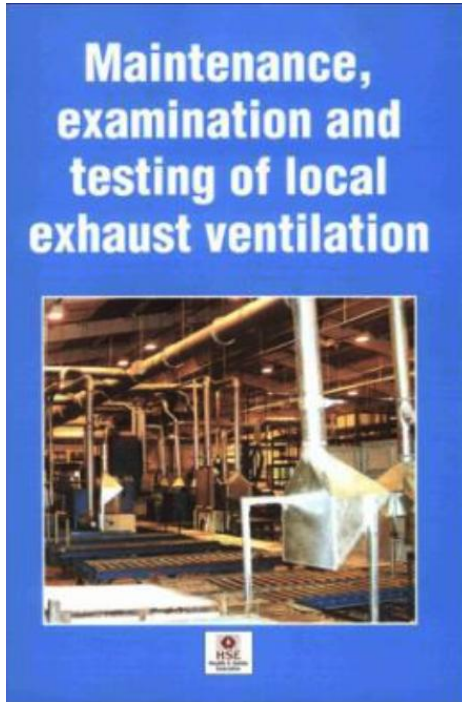
Report Reference:

19 Appendix A – Other Equipment (please specify)

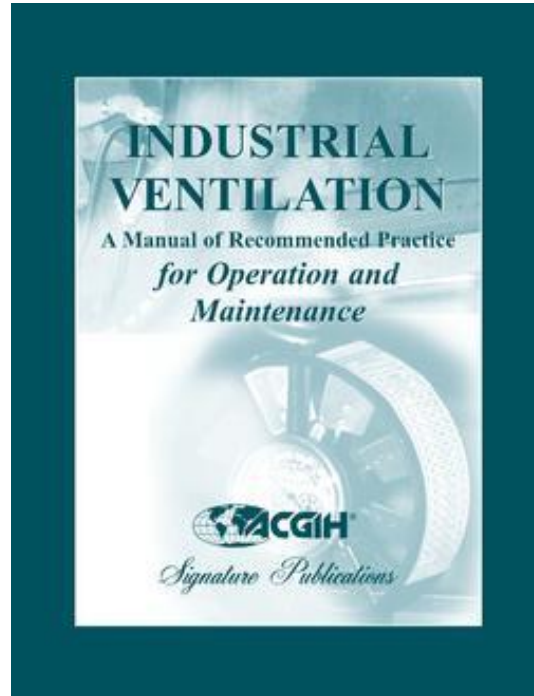
System:				Location:				HC-1:			
Service:				Manufacturer:				AC-1:			
Drawing:				Certification:				DATE:			
Supplier:				Classification:							
MODEL No:				SERIAL No.:				TYPE:			
CHECK	CHECK DESCRIPTION							STATUS	INIT.	DATE	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
Notes and/comments:											
	Completed By:	Approved By:	Accepted By:								
Company:											
Signature:											
Name:											
Date:											



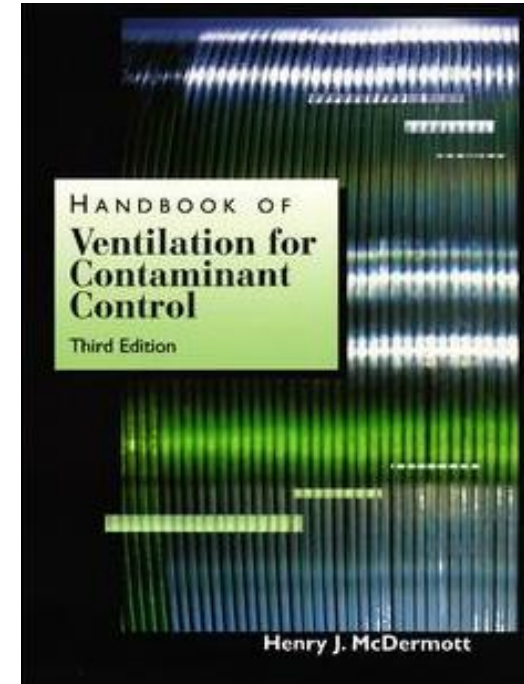
# Guidance...



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