

# How to reach 6-log decontamination in a L3 laboratory with the Phileas® technology?

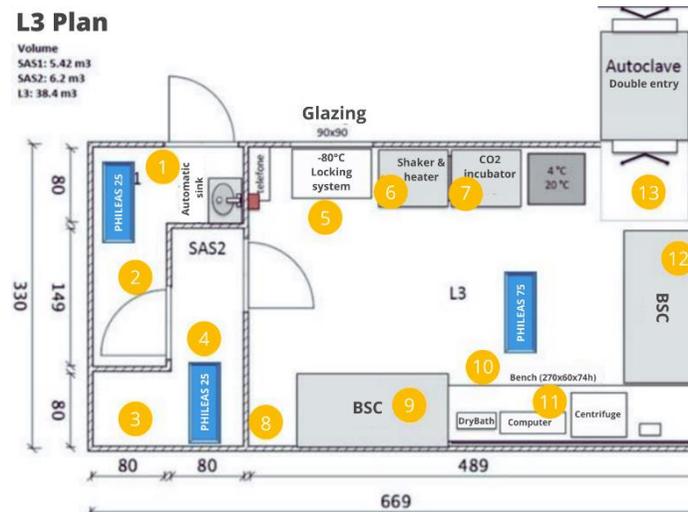
38 m<sup>3</sup> L3 laboratory and its two 5 & 6 m<sup>3</sup> locks

## Objective

As we know from experience (see other use cases), Airborne Surface Disinfection (ASD) meets daily BSC disinfection needs, as well as weekly filters disinfection or emergency disinfection requirements. The objective here is to illustrate the decontamination of a L3 Laboratory and its 2 locks by O2SAFE® (7.4%) with biological indicators, for sterilization efficiency.

## Material & Equipment

Item	Specification	Remarks
Diffuser	Phileas® 75 in L3 Phileas® 25 in each lock	Flow rate: 1200mL/h Flow rate: 700mL/h
Disinfectant	O2SAFE®	Dosage: 12mL/m <sup>3</sup> ; [C] = 7.4% H2O2
Biological Indicator (BI)	- Apex Biological Indicator - <i>Geobacillus stearothermophilus</i>	2.78.10e4, 2.96.10e5 or 2.08.10e6 CFU per stainless steel carrier
Culture Media	Tryptic soy broth	55-60°C for 7 days
Volume	Laboratory: 38.4m <sup>3</sup> Airlock 1: 6.2m <sup>3</sup> Airlock 2: 5.4m <sup>3</sup>	O2SAFE®: 460.8mL O2SAFE®: 74.4mL O2SAFE®: 65mL



## BI locations

13 BI have been positioned in the laboratory (locations previously determined to be the most difficult to sterilize) before the diffusion:

On the airlock floors, only one 6log indicator has been placed. In each of the other 11 locations, 3 BIs (4log, 5log and 6log) have been placed.

## Lab decontamination

### Protocol steps:

1. Place the generator on the working place
2. Program the Phileas® devices and turn off the ventilation system
3. Press 'start' and leave the place: diffusion, contact time & aeration (cycles) will take place
4. After ventilation, remove the indicators and deliver them to the laboratory for sterility testing – reading after 7 days

Example of calculation for the volume of disinfectant needed:  
 Lab: 38.4 (m<sup>3</sup>) \* 12 (mL/m<sup>3</sup>) = 460.8 mL

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## Decontamination cycle

Step	Cycle	Time (hh:mm)	Remarks
1	H <sub>2</sub> O <sub>2</sub> Diffusion	00:34	Maximum time
2	Contact time	02:00	7.4% H <sub>2</sub> O <sub>2</sub>
3	Ventilation	00:10	Capacity: 6000 m <sup>3</sup> /h
	TOTAL	02:44	Maximum time

## Results

Day	Control +	Control -	Floor (x6)	Bench (x3)	Work plate (x2)	Incubator (x2)
Day 0	+	Neg*	Neg	Neg	Neg	Neg
Day 2	+	Neg	Neg	Neg	Neg	Neg
Day 7	+	Neg	Neg	Neg	Neg	Neg

\* **All 13 Biological Indicators turned negative: 4-log, 5-log as well as 6-log BIs**  
 Protocol: place BI into the culture media while still inside the decontaminated space, then incubate at 55-60°C  
 If spores survive the sterilization cycle, the culture medium will turn yellow (positive). If the spores have been killed, the culture medium will remain purple (negative).

## Conditions recap

- ✓ For L3 lab environment, crucial importance to thoroughly prepare then follow the protocol ([C], time, number of machines), wear PPE and turn HVAC off
- ✓ 38 m<sup>3</sup> L3 lab and two airlocks, 5 and 6m<sup>3</sup> each
- ✓ Diffusers Phileas® 75 & Phileas® 25. No fans needed to cover the whole volume. Disinfectant O2SAFE® 7.4% H<sub>2</sub>O<sub>2</sub>, dose 12mL/m<sup>3</sup>
- ✓ 13 Biological Indicators placed, 4-log to 6-log
- ✓ Diffusion management and report through MyPhileas® application



## Conclusion

- ✓ **The Phileas® 75 / O2SAFE® H<sub>2</sub>O<sub>2</sub> pair is an effective decontamination solution for a L3 laboratory standard. All 6-log BIs turned negative, which corresponds to a sterilization level.**

## General ASD & L3 lab points

Decontamination compliant with norm EN 17-272 and non corrosive for laboratory tools.

ASD has proven its efficiency for sterilization process and responds well to the negatively pressurized environment in L3 labs.

The typology of the room needs to be taken into account: usually a combination of several diffusers is mandatory to efficiently decontaminate the lab: Phileas® 75 for large spaces + Phileas® 25 for small volumes.

To reach 6-log efficiency, increase contact time rather than dosage (overdosage can be counter-productive).