Clean Room at the LSC

Meeting for users

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OUTLINE

- Clean Rooms: Introduction
- Clean Room at the LSC
  - Installation and equipment
  - Working protocol & Courses (Authorization)
- Experiments requieremements

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Clean Rooms: Introduction

A Clean Room: a room in which the concentration of airbone particles and other parameters (T, relative humidity) are controlled to specified limits and its construction and use minimize the particles introduction, generation and retention.

Clean room classes: maximun allowable number of particles per cubic meter of air with a size of 0.5 μm or larger.

Standards: FED-STD- 209E, ISO 14644

Class FED-STD- 209	maximum particles/ft³					ISO equivalent
	≥0.1 μm	≥0.2 μm	≥0.3 μm	≥0.5 μm	≥5 μm	
1	35	7	3	**1**		ISO 3
10	350	75	30	**10**		ISO 4
100		750	300	**100**		ISO 5
1,000				**1,000**	7	ISO 6
10,000				**10,000**	70	ISO 7
100,000				**100,000**	700	ISO 8

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Contamination

The only way to control contamination is to control the total environment.

Sources of contamination

- Facilities
- People
- Tool generated
- Fluids
- Product generated

Key elements of contamination control

- Cleanroom architecture
- Filtration
- Cleaning
- Cleanroom garments and tools
- Humans: body generation processes, behaviour and attitude

Strict procedures should be followed whenever entering or cleaning a cleanroom.

Compromise is not acceptable when cleaning in a cleanroom.

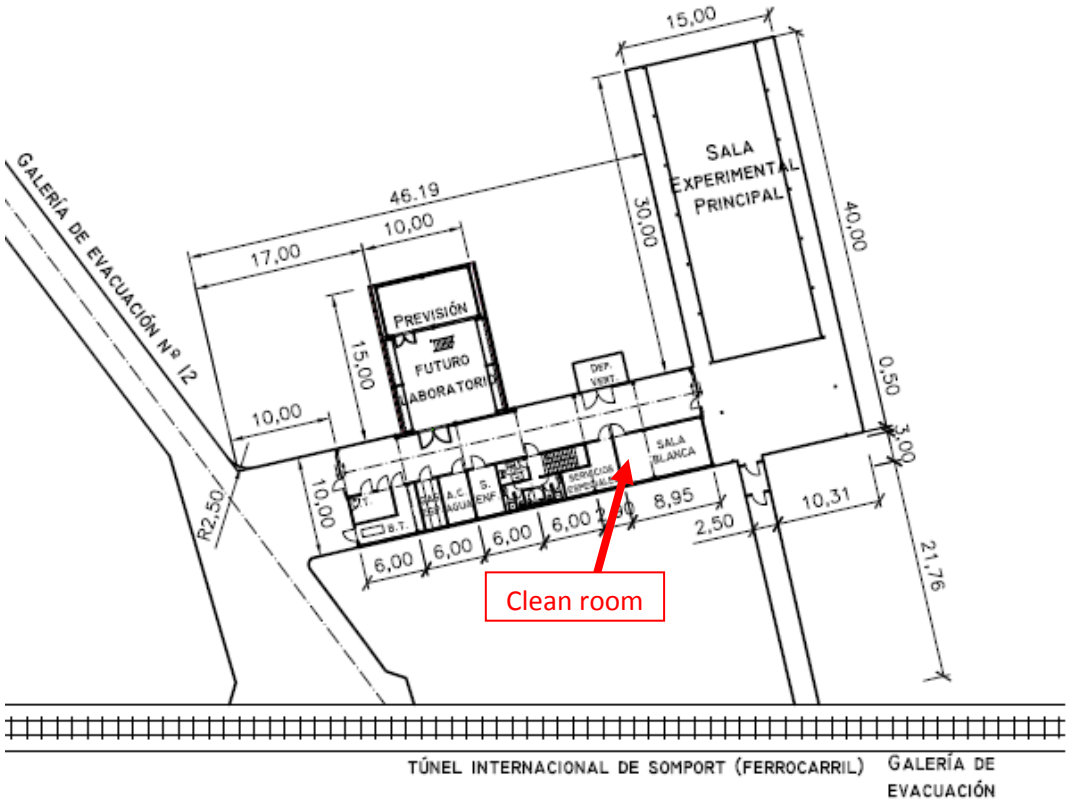
- Theoretical and practical Courses
- Working Rules
- Cleaning Protocol

Clean Room at the LSC

General characteristics

- Dimensions: 8,9 x 4,8 x 4 m (45 m^2)
- Adjacent Mechanical Workshop and Hall A (main experimental room)
- Close to facilities (water, gases, telephone and internet, waste reception room…)

Location at the LSC



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Clean Room at the LSC

Clean room specifications

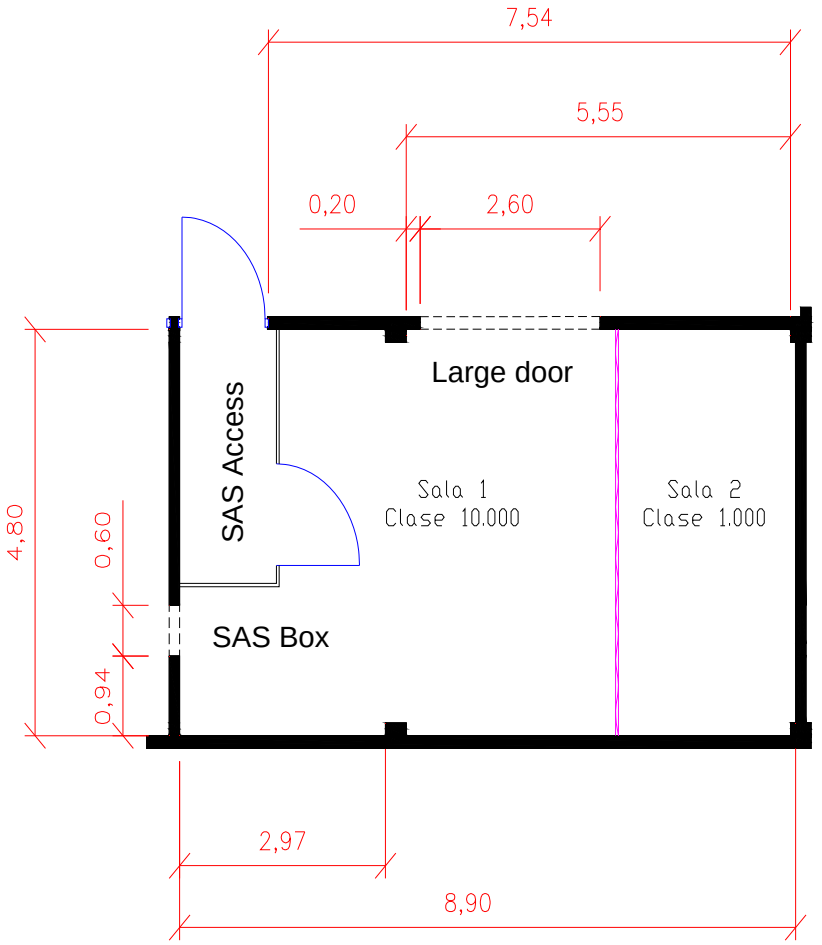
- Classes: Room 1 (ISO 7) and Room 2 (ISO 7/6), separated by a curtain.

  - Curtain open: Room 1&2, ISO 7
  - Curtain closed: Room 1 ISO 7, Room 2 ISO 6

- SAS access: changing room, doors conected, window, bench to separate zones, semaphore.

- SAS box: move tools/materials between the Clean Room and the workshop

- Large door: entrance of big equipments



INSTALLATION

Clean room architecture

- Walls & compartments: panels, hermetic, easy to clean.
- Doors: panel, connected (to avoid the simultaneous opening), easy to clean, stainless steel elements, hermetic.
- Curtain: plastic, 20 cm over the floor (air flux), linked to the ceiling, open/close system.
- Windows: over the large door, safety & security issues, doubled glass, hermetic.
- Technical Ceiling: made of panel, allocated services (lights, air diffusers, fume detector, gases/compressed air tubes…), hermetic, accesible to maintenance.
- Floor: plastic finish (mechanical & chemical resistance, anti-static), smooth, easy to clean, hermetic.
- SAS Box: doubled door, doors connected (to avoid the simultaneous opening), mechanical & chemical resistance, hermetic, no corners.

Ventilation and air treatment equipment

Conditions in the Clean Room

Room	People	Class	Temperature	Humidity	Pressure
SAS access	0/1	ISO 7	21 ± 2 ºC	40-60 %	(+)
Room 1	1/2	ISO 7	21± 2 ºC	40-60 %	(++)
Room 2	1/2	ISO 7 / 6	21 ± 2 ºC	40-60 %	(+++)

A specific and exclusive equipment.
Installed over the technical ceiling or in the workshop.

Consists of:

- Climatization system: air inside/outside the clean room, filtration steps, conditioning system (T, humidity).
- Air ducts: steel ducts, over the technical ceiling.
- Diffusers: final elements to put air inside/outside, filters or grille (supply or return circuit).
- Regulation and control system: specific and exclusive equipment for the clean room control, every parameter (pressure, T, humidity…) shown in a panel.

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Services and facilities in the Clean Room

- Electrical distribution & power supply: 25KW, normal (220V) + SAI (220V) + three-pin (380V) lines, plugs & switchs (hermetic, easy to clean).

- Lights: 500lux, homogeneous distribution over the technical ceiling, hermetic, easy to clean and maintain, emergency lights over the doors.

- Gases & compressed air facility: 2 gases lines (N2, Ar) + air, 2 working points, easy to clean, no horizontal areas.

- Telephone and internet access: one conection, cordless system (2 terminals, Room 1 & Room 2).

- Installation of fire safety measures: fume detector and alarm switch.

- Destilled water and sink: destilled water equipment installed in the workshop with access tap inside the clean room, sink (drain).

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FURNITURE & EQUIPMENT

Basic clean room furniture

- Tables: stainless stell, wheels, with holes in the working area, solid.
- Chairs: polyutethane, wheels, adjustable.
- Chest of drawers: stainless steel, wheels, 3-4 drawers, handle.
- Shelves: stainless steel, 4-5 shelves, grilled structure, wheels.
- Bench: in the SAS access, stainless steel, 1 self for shoes, solid.
- Mirrow: polycarnonate, in the SAS access, for safety reasons.
- Basket: stainless steel, pedal.
- Sink: stainless steel, 1 hole, over the panel (wall).

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Furniture Requierements

No particles generation
Easy to clean
Facilitate air flux

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Clean Room at the LSC

Equipments

- Vacuum cleaner: clean room specifications, solid waste, wheels.

- Smoke cabinet (toxic, chemicals…): mechanical & chemical resistance, switchs and gases connections, light inside, 1500 x 810 x 2300 mm.

- Destilled water equipment: small design, tank 80L, water quality Type 1 (Milli-Q) and standard destilled water, with taps.

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WORKING PROTOCOL & COURSES (AUTHORIZATION)

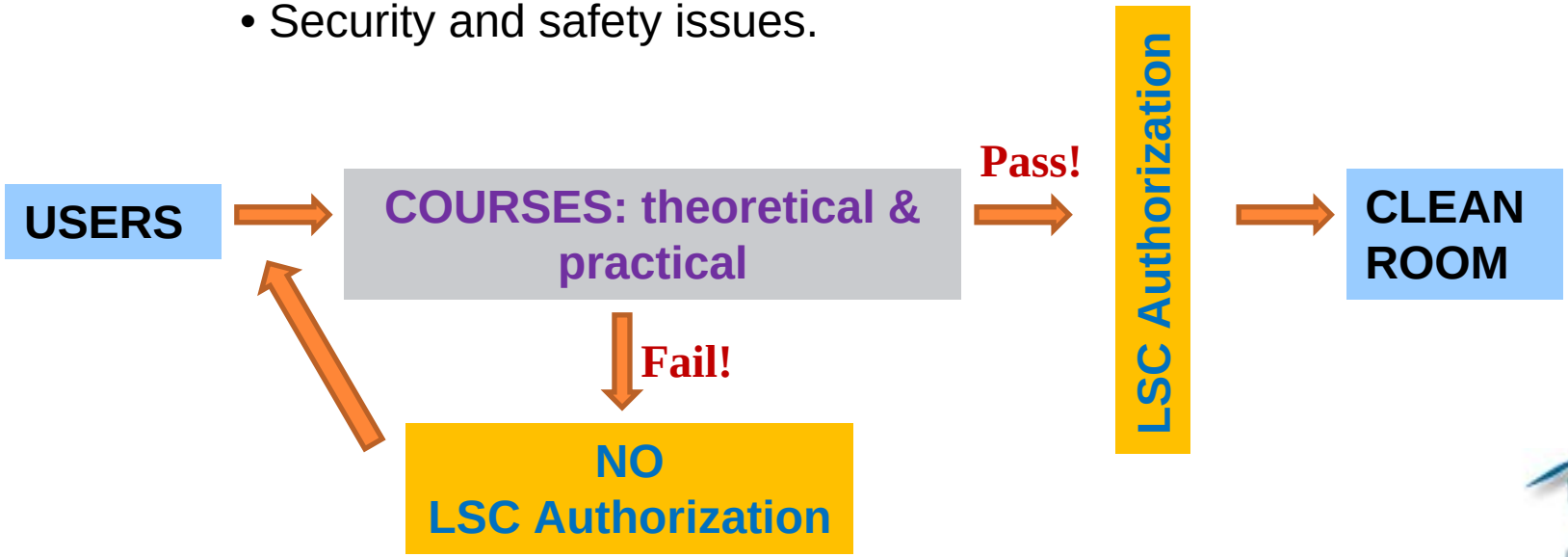
PEOPLE

!!!!the most important contamination in a clean room!!!

(body generation processes, behaviour, attitude)

Document about the rules for working in the Clean Room

- SAS access: planning, garments, behaviour.
- Material and tools introduction and use.
- Behaviour and attitude in the clean Room.
- Security and safety issues.



Experiments Requierements

LSC asks details about experiment support and requierements in the Clean Room

- **Details about the task: possible contamination, products, Class requiered, planning…**
- **Tools & general elements or furniture.**
- **Any other special request.**

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