

# ISO 7 CLEANROOM



# Overview



DIAMOND has created a **new ISO 7 cleanroom (class 10'000 according to FED STD 209E)**, in order to supply products such as connector sets, pigtails, patchcords, adapters and mechanical parts that are cleaned and packaged in a controlled environment.



The Diamond cleanroom takes all the following aspects into account:

- Temperature humidity control
- Control of particulate concentration
- Electrostatic discharge
- Gas contaminants
- Airflow pattern control
- Pressurisation

# Classification



ISO Class	maximal particles/m <sup>3</sup>						FED STD 209E
	≥0.1 μm	≥0.2 μm	≥0.3 μm	≥0.5 μm	≥1 μm	≥5 μm	
ISO 1	10	2					
ISO 2	100	24	10	4			
ISO 3	1,000	237	102	35	8		Class 1
ISO 4	10,000	2,370	1,020	352	83		Class 10
ISO 5	100,000	23,700	10,200	3,520	832	29	Class 100
ISO 6	1,000,000	237,000	102,000	35,200	8,320	293	Class 1000
ISO 7				352,000	83,200	2,930	Class 10'000
ISO 8				3,520,000	832,000	29,300	Class 100'000
ISO 9				35,200,000	8,320,000	293,000	Room air

# Cleanroom characteristics

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Class:	ISO 7 (according to norm DIN EN ISO 14644-1)
Type:	Turbulent air flow
Flow rate:	Min. 40 air exchanges /h
Filters:	3 ULPA U15 filters
Air flow:	3,600 m <sup>3</sup> /h total
Overpressure:	24 Pa
ESD-compliant:	Yes

## Surface:

Cleanroom	34 m <sup>2</sup>
Changing room	5 m <sup>2</sup>
Material airlock	1 m <sup>2</sup>
<b>Total</b>	<b>40 m<sup>2</sup></b>

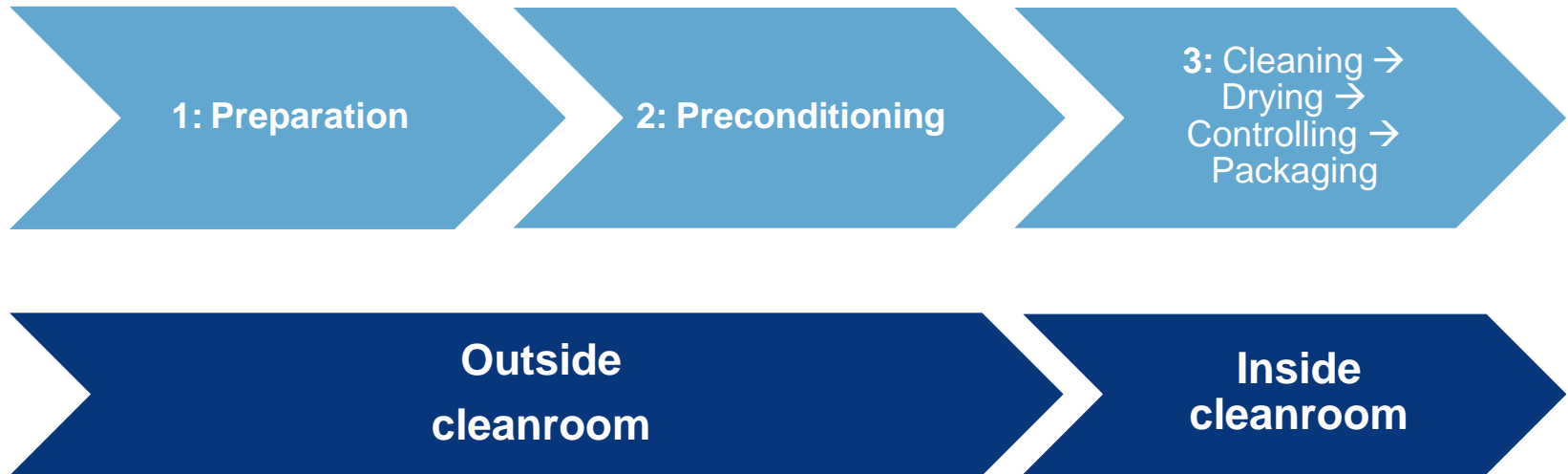
Lights and filters are under UPS

# Product capabilities

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- Connector sets
- Pigtails, patchcords
- Adapters
- Mechanical parts
  
- Ceramics
- Titanium
- Steel
- Alloys
- Plastics
- Widia
- Aluminium

# Processes



# Processes overview



Process	Specification	Connector sets	Pigtails, patchcords & adapters	Mechanical parts
Preparation	Dürr Ecoclean (hydrocarbon solvent)	X		X
	Fisa Ultrasonic bath line (sodium soaps)	X		X
Preconditioning	Ionic air flow	X	X	X
Cleaning → Drying → Controlling → Packaging	Ultrasonic bath acetone	X		X
	Ultrasonic bath IPA	X		X
	Ultrasonic bath water	X		X
	Cleaning with wipes and IPA		X	
	Drying	X	X	X
	Controlling	X	X	X
	Report	X	X	X
	Packaging in N <sub>2</sub> : sealed blisters	X		
	Packaging in N <sub>2</sub> : double skin bag		X	X
	Packaging in air: blisters with VCI			X

# Preparation (outside cleanroom)



Dürr Ecoclean  
(hydrocarbon solvent)

Fisa Ultrasonic  
cleaning line  
(sodium soaps)

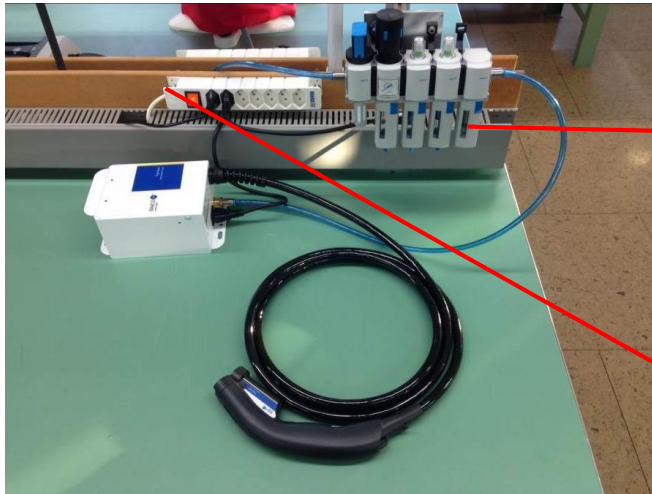
Production  
environment

Preparation



## Preconditioning (outside cleanroom)

Before entering the cleanroom, every product is initially cleaned with a ionised air flow to discharge static from the surface.



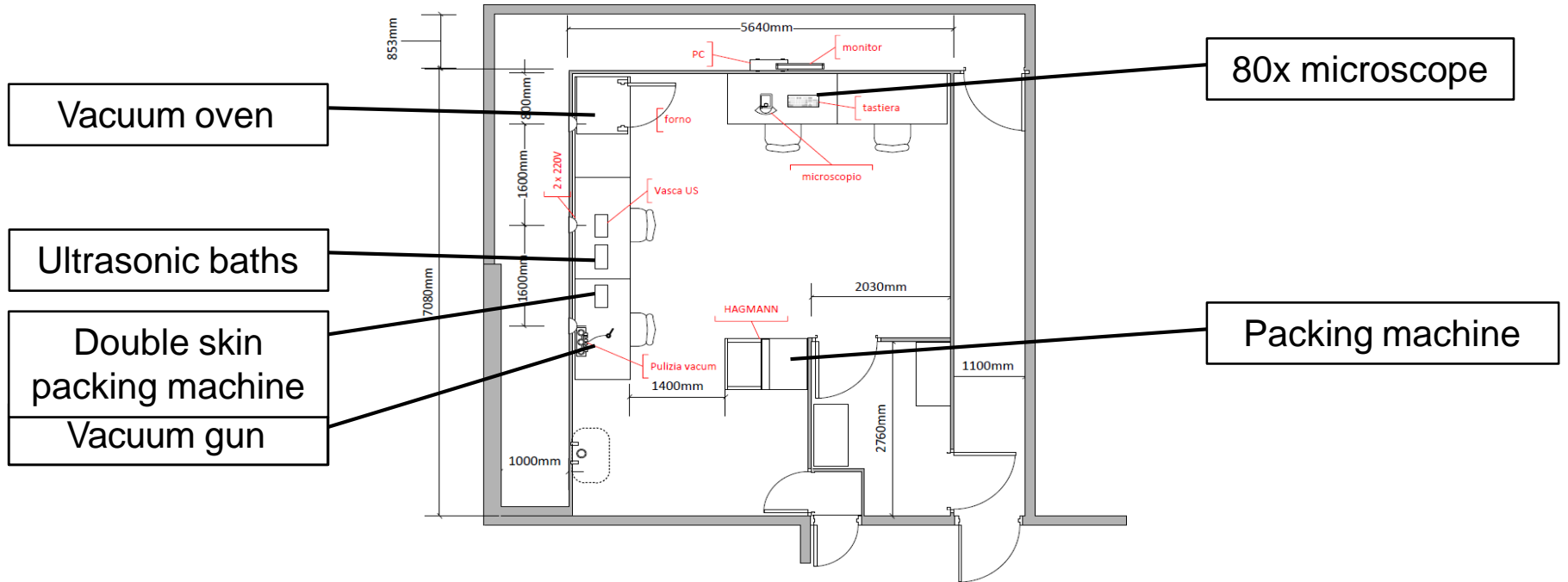
### Filters:

- Filter reducer 0.3 ... 7 bars, 5  $\mu\text{m}$
- Fine filter and high capacity filter, 1  $\mu\text{m}$
- Fine filter and high capacity filter, 0.01  $\mu\text{m}$
- Activated carbon filter

### Air gun:

- Operating voltage 5kV AC
- Air consumption 68 l / min
- Required air pressure 7 bar

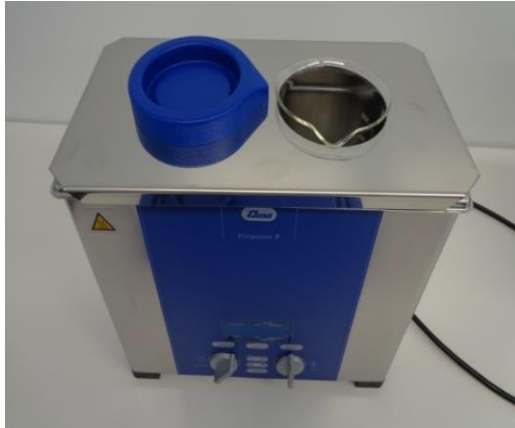
# Cleanroom overview



# Cleaning (inside cleanroom)

## 3 Ultrasonic baths with:

- Acetone
- IPA
- Deionised water



## Compatible materials:

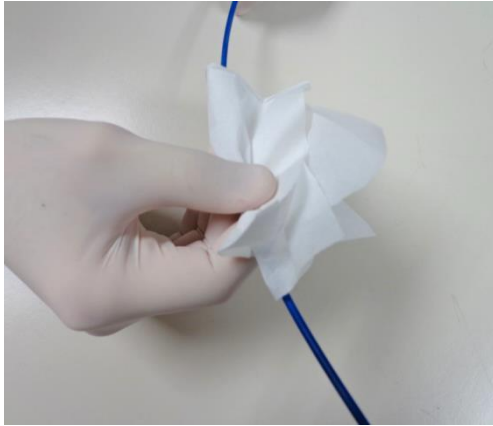
- Ferrule
- Steel
- Alloys
- Plastics
- Widia
- Aluminium

## Cleaned materials:

- Resins
- Glues
- Adhesives
- Fats
- Oils

# Cleaning (inside cleanroom)

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- Ability to clean patchcords up to 30 metres (90 ft) may be limited by cable specification
- Cleaning with cleanroom wipes and IPA

## Drying (inside cleanroom)

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### Thermo Scientific Vacuum Oven

- Temperature: 150°C – 200°C (59°F – 392 °F)
- Capacity: 130 l (4.5 cu. Ft.)
- Max. vacuum: 50 mbar

## Controlling (inside cleanroom)

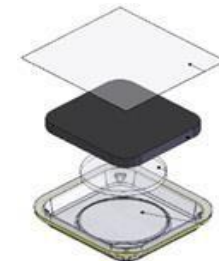
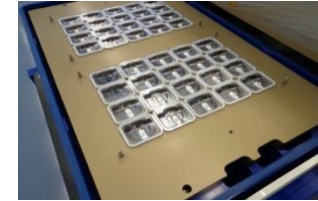
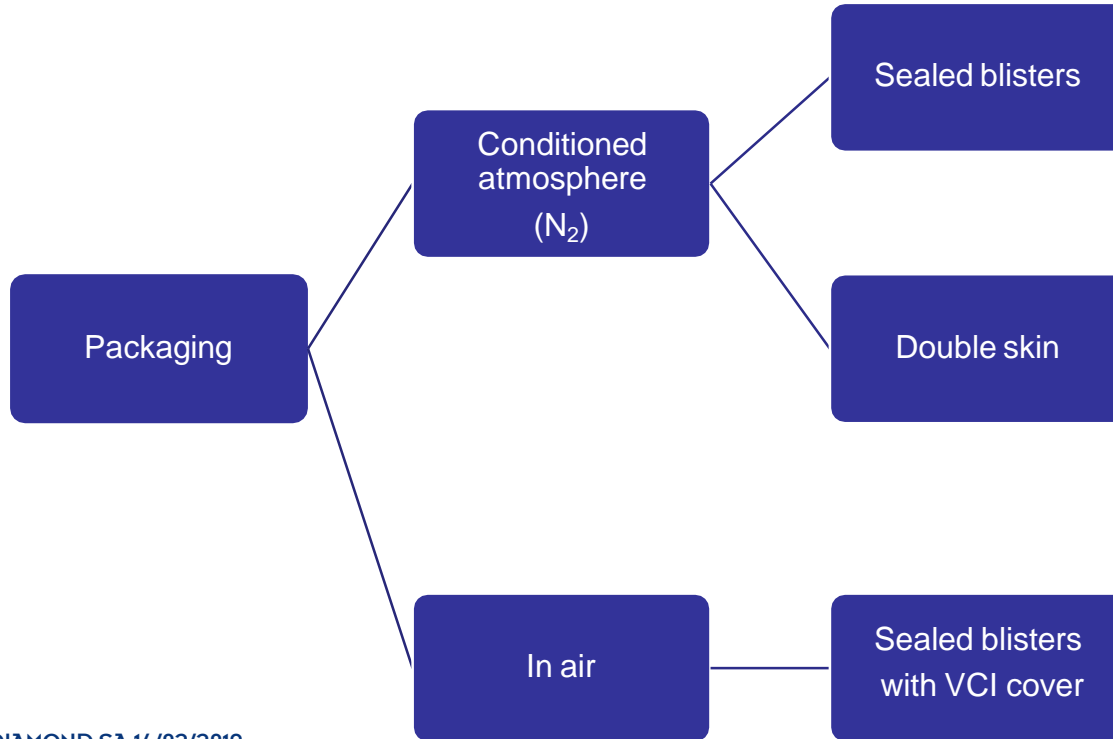


### Leica M80 Microscope

- 80x zoom
- 4-angle illumination
- Leica 170HD camera
- Leica V4.3 application suite

Suitable for 100% inspection, image storing and complete report.

# Packaging (inside cleanroom)





[www.diamond-fo.com](http://www.diamond-fo.com)

