

Type of document: General Reg. No. CLR-VD-20-004

Issued by: Valdis Korsaks Approved Date: 21.10.2020  
 Position: Head of Cleanroom

Approved: Mārtiņš Rutkis Version: 1  
 Position: Director



INSTITUTE OF SOLID STATE PHYSICS  
 UNIVERSITY OF LATVIA

Reg. No. 90002124925  
 8 Kengaraga street, Riga, LV-1063, Latvia  
 Telephone. (371) 67187816,  
 E-mail: [issp@cfi.lu.lv](mailto:issp@cfi.lu.lv); Home page: [www.cfi.lu.lv](http://www.cfi.lu.lv)

## ISSP UL Cleanroom Services in 650 m<sup>2</sup>

### 1. Controlled environment ISO 4 – 8 class. Classification of air cleanliness by particle concentration (ISO 14644-1:2015)

ISO Class number (N)	Maximum allowed concentrations (particles/m <sup>3</sup> ) for particles equal to and greater than the considered sizes shown below						Fed 209 E Class number (N)
	0.1 μm	0.2 μm	0.3 μm	0.5 μm	1.0 μm	5.0 μm	
Class 4	10 00 0	23 70	10 20	35 2	83		Class 10
Class 5	10 00 00	23 70 0	10 20 0	35 20	83 2		Class 10 0
Class 6	10 000 00	23 70 00	10 20 00	35 20 0	83 20	29 3	Class 10 00
Class 7				35 20 00	83 20 0	29 30	Class 10 00 0
Class 8				35 20 00 0	83 20 00	29 30 0	Class 10 00 00

### 2. Cleanroom facilities:

#### 2.1. Ventilation/Climate

- 2.1.1. Makeup Air Unit to the cleanroom – from 5700 m<sup>3</sup>/h to 8000 m<sup>3</sup>/h
- 2.1.2. Additional Makeup Air Unit  
 Room - CLR 114 from 0 to 1150 m<sup>3</sup>/h  
 Room - CLR 116 from 0 to 1700 m<sup>3</sup>/h
- 2.1.3. Controlled temperature regarding to [cleanroom environment specification](#).
- 2.1.4. Controlled overpressure in the cleanroom regarding to [cleanroom environment specification](#).

#### 2.2. Deionized water (DI water, DIW or de-ionized water).

##### Specification:

- Resistivity: 18.2 MΩ·cm (0.0555 μS/cm) at 25°C DIW water temperature;
- Total Organic Carbon (TOC): ≤ 50 μg/l
- Heterotrophic Bacteria Count: ≤ 10 CFU/ml;
- Sodium: ≤ 1 μg/L
- Chloride: ≤ 3 μg/L
- Tubing: PVDF, high purity
- Reverse osmosis (RO) production power: 40 L/h
- Reverse osmosis (RO) tank volume 2000 L
- Deionized water (DIW) production power: 12 L/min

#### 2.3. Water cooling system

- Site city water cooling system.
- Chillers (Flow rate 5-40l/min; Cooling capacity 2.1 KW; water temperature from 15 - 18 °C).

Type of document:	General	Reg. No.	CLR-VD-20-004
Issued by:	Valdis Korsaks	Approved Date:	21.10.2020
Position:	Head of Cleanroom		
Approved:	Mārtiņš Rutkis	Version:	1
Position:	Director		



INSTITUTE OF SOLID STATE PHYSICS  
UNIVERSITY OF LATVIA

Reg. No. 90002124925  
8 Kengaraga street, Riga, LV-1063, Latvia  
Telephone: (371) 67187816,  
E-mail: [issp@cfi.lu.lv](mailto:issp@cfi.lu.lv); Home page: [www.cfi.lu.lv](http://www.cfi.lu.lv)

## 2.4. House gases, max 12 bar pressure:

### 2.4.1. Nitrogen (N<sub>2</sub>),

Purity >99.999 % (5.0);  
Purity >99.9999 % (6.0).

## 2.5. Gases (in bottles):

### 2.5.1. Nitrogen (N<sub>2</sub>), 20 L/300 bar

Purity >99.99 % (4.0).

### 2.5.2. Argon (Ar), 200 bar.

Purity >99.99 % (4.0), 50 L;  
Purity >99.999 % (5.0), 50 L or 10L;  
Purity >99.9999 % (6.0), 50 L or 10L.

### 2.5.3. Oxygen (O<sub>2</sub>), 200 bar.

Purity >99.5 % (2.5), 50L;  
Purity >99.999 % (5.0), 50 L or 10L;  
Purity >99.9999 % (6.0), 50 L or 10L.

### 2.5.4. Helium (He), 200 bar

Purity >99.95 % (3.5), 50L;  
Purity >99.999 % (5.0), 50 L or 10L;  
Purity >99.9996 % (5.6), 50 L or 10L;  
Purity >99.9999 % (6.0), 50 L or 10L.

### 2.5.5. Certificate gas mixture Hydrogen + Argon 50L/200bar (H<sub>2</sub> 5%+Ar 95%)

H<sub>2</sub> purity >99.999 % (5.0), Ar purity >99.999 % (5.0).

### 2.5.6. Liquid Nitrogen (LN) in 25L Dewars.

Purity >99.999 % (5.0).

## 2.6. Process gasses (in bottles):

### 2.6.1. Hydrogen (H<sub>2</sub>), 200 bar

Purity >99.9 % (3.0), 50L;  
Purity >99.999 % (5.0), 50 L or 10L;  
Purity >99.9999 % (6.0), 50 L or 10L.

### 2.6.2. Silane (SiH<sub>4</sub>) 50L/200 bar or 10L/200 bar

Purity >99.999 % (5.0);

### 2.6.3. Ammonia (NH<sub>3</sub>) 50L or 10L

Purity >99.999 % (5.0);  
Purity >99.9999 % (6.0).

### 2.6.4. Other process gases are supplied by mutual agreement.

Type of document:	General	Reg. No.	CLR-VD-20-004
Issued by:	Valdis Korsaks	Approved Date:	21.10.2020
Position:	Head of Cleanroom		
Approved:	Mārtiņš Rutkis	Version:	1
Position:	Director		



INSTITUTE OF SOLID STATE PHYSICS  
UNIVERSITY OF LATVIA

Reg. No. 90002124925  
8 Kengaraga street, Riga, LV-1063, Latvia  
Telephone. (371) 67187816,  
E-mail: [issp@cfi.lu.lv](mailto:issp@cfi.lu.lv); Home page: [www.cfi.lu.lv](http://www.cfi.lu.lv)

## 2.7. Humidity:

- 2.7.1. Controlled up to 55% RH in room CLR-123.
- 2.7.2. In other rooms not controlled.

## 2.8. Compressed Dry Air (CDA)

CDA is supplied to cleanroom with following specification and according to ISO 8573-1:2010 standard:

- Compressed air purity class for particles is “Class 1”
- Compressed air purity class for humidity is “Class 4”
- Compressed air purity class for total oil is “Class 1”
- Consumption (max): 2.25 m<sup>3</sup>/ min or 2250 L/min..
- Pressure in CDA line is from 7.0 – 9.9 bar.

## 2.9. Cleanroom exhaust system

- Room CLR-131. Solvent and heat exhaust – up to 230 m<sup>3</sup>/h
- Room CLR-114. Solvent and heat exhaust – up to 700 m<sup>3</sup>/h
- Room CLR-116. Solvent and heat exhaust – up to 550 m<sup>3</sup>/h
- Rooms CLR-118, CLR-123, CLR-120 . Solvent and heat exhaust – up to 550 m<sup>3</sup>/h

## 2.10. Waste Chemicals

Following chemicals are collected in 10L local tanks:

- Isopropyl Alcohol + Acetone + Other Solvents
- Chlorinated solvents
- Acids and bases

## 2.11. Electricity

- 2.11.1. Process room CLR-110: 220 V / 16 A; 380 V / 32 A.
- 2.11.2. Process room CLR-114: 220 V / 16 A.
- 2.11.3. Process room CLR-116: 220 V / 16 A; 380 V / 16A; 20 A.
- 2.11.4. Process room CLR-118: 220 V / 16 A; 380 V / 16 A.
- 2.11.5. Process room CLR-120: 220 V / 16 A; 380 V / 16 A; 63A.
- 2.11.6. Process room CLR-123: 220 V / 16 A; 380 V / 16 A.
- 2.11.7. Process room CLR-124: 220 V / 16 A.
- 2.11.8. Process room CLR-129: 220 V / 16 A.
- 2.11.9. Process room CLR-131: 220 V / 16 A; 380 V / 32 A.
- 2.11.10. Support room CLR-115: 220 V / 16 A.
- 2.11.11. Support room CLR-117: 220 V / 16 A; 380 V / 10 A.

Type of document: General Reg. No. CLR-VD-20-004  
Issued by: Valdis Korsaks Approved Date: 21.10.2020  
Position: Head of Cleanroom  
Approved: Mārtiņš Rutkis Version: 1  
Position: Director



INSTITUTE OF SOLID STATE PHYSICS  
UNIVERSITY OF LATVIA

Reg. No. 90002124925  
8 Kengaraga street, Riga, LV-1063, Latvia  
Telephone: (371) 67187816,  
E-mail: [issp@cfi.lu.lv](mailto:issp@cfi.lu.lv); Home page: [www.cfi.lu.lv](http://www.cfi.lu.lv)

2.11.12. Support room CLR-119: 220 V / 16 A.

2.11.13. **Other electricity power are supplied by mutual agreement.**

## **2.12. Safety Systems**

- Fire alarms: Smoke, heat detectors and manual alarm activation buttons.
- Video monitoring 24/7.
- Authorizes door access system.
- Temperature monitoring system with SMS notification.
- Overpressure monitoring system with SMS notification.
- Exhaust system monitoring system with SMS notification.
- Supply air monitoring system with SMS notification.

## **3. Cleanroom Safety and correct behaviour training**

## **4. Cleanroom booking system (LIMS)**

## **5. Cleanroom consumables and protection materials:**

- 5.1. Mob Caps;
- 5.2. Beard Snoods;
- 5.3. Face masks;
- 5.4. Lab Coveralls (Size: S - 4XXL);
- 5.5. Nitrile Gloves (Size: S - XL);
- 5.6. Cotton gloves (Size: S - XL);
- 5.7. Cleanroom shoes;
- 5.8. 55%Cellulose / 45%Polyester dry, Non-Sterile wipes in size 4"x4" and 9"x9";
- 5.9. 100% Polyester dry, Non-Sterile wipes in size 4"x4" and 9"x9";
- 5.10. Notebooks;
- 5.11. A4 cleanroom paper;
- 5.12. Cleanroom pens and markers;
- 5.13. Working tools "Gedore";
- 5.14. Isopropanol with purity 99.8% and Acetone with purity 99.5%
- 5.15. Swabs – Precision pointed tip and flexible head paddle.
- 5.16. Room cleaning and experimental tool cleaning accessories (dust wipes, cellulose/Polyester 9"x9" and 12"x12", isopropanol 99.8% and 10%, mobile N<sub>2</sub> gas cylinder with blow gun).