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| --- |
| ****Reviewed By**** |
| Name (Reviewer) | Position | Date | Signature |
| Daniel Kramer | Optical designer | NOTICE (RSD product category A) |
| Alice Hamalová | Clean Room Specialist | NOTICE (RSD product category A) |
| Pavel Korouš | Chief Engineer | NOTICE (RSD product category A) |
| Ladislav Půst | Manager installation of technology | NOTICE (RSD product category A) |
| Stefan Borneis | Senior Laser Scientist, Consultant | NOTICE (RSD product category A) |
| Daniele Margarone | RP3 Team Leader | NOTICE (RSD product category A) |
| Tomáš Laštovička | Team Leader BIS and C&C | NOTICE (RSD product category A) |
| Veronika Olšovcová | Safety Coordinator | NOTICE (RSD product category A) |
| Viktor Fedosov | SE & Planning group leader;Quality Manager | NOTICE (RSD product category A) |

|  |
| --- |
| ****Approved by**** |
| Name (Approver) | Position | Date | Signature |
| Georg Korn | Science and Technology Manager, Scientific coordinator of RP2-6 |  |  |
| Bedřich Rus | Scientific Coordinator of Laser Technology (RP1) |  |  |

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| --- |
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# Introduction

## Purpose

This Requirements Specification Document (RSD) lists the technical requirements and constraints on product applying in Cleanroom tents of ELI project. This can lead to the identification of product interfaces with the ELI science based technology and ELI building facility. This RSD also acts as the parent document for the technical requirements that need to be addressed in lower level design description documents.

## Scope

This RSD contains all of the technical requirements: functional, performance and design, delivery, safety and quality requirements for the following product *(PBS: E.E6.7)*: ***Laminar Fan Filter Units of type C for cleanroom tents*** *(further “FFU”).* This product is a product Category A.

Category A is an Off-the-shelf Product without necessity of modifications and necessity to be subjected to a verification program (review of design, inspection and testing) for ELI applications by the actual project specifications. All verification activities performing by a supplier shall be executed in accordance with the supplier’s plan of outgoing inspection and tests. Internal Acceptance Procedure of the product Category A shall be established and applied before the product implementation (operation phase).

## Terms, Definitions and Abbreviations

For the purpose of this document, the following abbreviations apply:

| **Abbreviation** | **Meaning** |
| --- | --- |
| CA | Contracting Authority |
| ELI | Extreme Light Infrastructure |
| FFU | Fan Filter Unit |
| HEPA | High Efficiency Particulate Arrestance  |
| ID | Identification |
| L x W | Length x Width |
| PBS | Product breakdown structure (code of ELI-Beamlines) |
| RSD | Requirements Specification Document |
| ULPA | Ultra Low Penetration Air |

## References to standards

If this document includes references to standards or technical documents the CA allows/permits also another equal solution to be offered. If a supplier offers another equal solution the CA shall not reject its bid, once the supplier by appropriate means in the bid proves that the offered supplies, services or works meet in an equivalent manner the requirements including references to standards or technical documents.

# General requirements

REQ-019984/A

The Supplier shall deliver the FFU of the Type C.

# Functional, Performance and Design requirements

## Dimensions and weight

REQ-019985/A

The FFU of the Type C shall have the following external dimensions:
1200 ± 15 mm x 590 ± 10 mm (L x W).

REQ-019986/A

Maximum height of the FFU Type C shall not exceed 380 mm.

REQ-019987/A

Maximum weight of the FFU Type C shall not exceed 35 kg.

## Filter types

### Air filter

REQ-019990/A

Air filter shall be replaceable from the top side of the FFU.

REQ-019991/A

Air filter of the FFU shall be ULPA (U15) type.

## Performance requirements

### Air-flow

REQ-019993/A

Average air-flow rate of the FFU shall be equal to 0.45 ± 0.10 m/s at one of the settings of the control unit (measured at > 0.1 m from filter surface).

### Volume flow

REQ-019994/A

The FFU Type C shall have maximum volume flow ≥ 1450 m3/h.

## Control

REQ-019997/A

Air-flow rate of the FFU shall be controlled by manual, at least three speeds (low, medium, high), switch or via integral potentiometer.

## Motor, cable and consumption

REQ-019998/A

Motor of the FFU shall be 220-230 V/50-60 Hz.

REQ-019999/A

Maximum power of the FFU Type C shall not exceed 400 W.

REQ-020000/A

Power cable for each FFU shall be included in the delivery.

## Noise

REQ-020001/A

Maximum FFU noise measured at distance ≤ 1 m from filter surface shall not exceed 65 dB(A).

## Surface finish

REQ-020003/A

The exterior of the FFU shall be made of mill finished aluminum or stainless steel or powder coated.

# Environmental Requirements

REQ-020005/A

The FFU shall be designed for and capable of meeting all requirements during long term operation in cleanrooms environment of class 7 according to ČSN EN ISO 14644 (equivalent to ISO 14644).

*NOTE: This requirement doesn’t apply to the filter changing operation.*

# Delivery requirements

REQ-020006/A

All elements of the FFU shall be delivered in protective package preventing damage and contamination. The package shall have a minimum of one layer of clean packaging.

REQ-020007/A

Each element of the FFU shall be cleaned and packaged in clean environment of class 7 according to ČSN EN ISO 14644 (equivalent to ISO 14644) or cleaner. If the Supplier cannot fulfill class 7 cleanliness requirements, the Supplier and the CA shall agree on the cleaning method to be used to clean devices without decreasing the devices' performance and to avoid contamination of the clean space of the CA.

# Safety Requirements

## General Safety Requirements

REQ-020008/A

The Supplier shall supply a Declaration of Conformity or any other equivalent document legally recognized and accepted in the Czech Republic for each product type if the appropriate legislation determines the Supplier's obligation to have a Declaration of Conformity (or the equivalent document) for the purposes of a Device sale in the Czech Republic to fulfil the requirements of 2001/95/EC directive or applicable Czech law.

# Quality Requirements

## General Quality Requirements

REQ-020009/A

The Supplier shall provide the Product User Manual as part of the delivered FFU. The Manual shall include the instructions and descriptions regarding the following procedures: maintenance, servicing and installation.

REQ-020010/A

Supplier shall provide information on execution of outgoing check of the Product. At least this information shall comprise declaration about execution of outgoing check and declaration of conformity with technical requirements defined by the product RSD and completeness of the Product.

*NOTE: Alternatively the Supplier might provide the CA with information (e.g.: catalogue/technical data sheets, product manuals or other similar documentation) subject to the condition that such documentation is detailed enough to prove meeting all requirements stipulated herein.*

REQ-020011/A

The Supplier shall establish and maintain a non-conformance control system compatible with ČSN EN ISO 9001 (equivalent to EN ISO 9001).

## Specific Quality Requirements

REQ-020012/A

The SI base units (metric) or other derived from them SI units shall be used for all the FFU documentation and labels.

REQ-020004/A

Each FFU shall be supplied with a quality test report stating filter efficiency relevant for the given filter type and pressure resistance.