2.6 - PAQA

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SCS Risk Analysis

SCS Risk Analysis

ATRIUM-129998 – Version :5

Scope of the document : all the handling operations on the detectors from incoming at CPPM to delivery to NISP

→ Here are presented the risks analysis for the operations during the characterization process at CPPM

Operation	Risk	Cause	Action
Reception at CPPM	- Deterioration - Contamination - Safety	- Bad handling - ITAR rules	- EUCL-CPP-PR-7-001 : Incoming Procedure + NASA supervision - EUCL-CPP-PR-7-009 : SCS pictures - ITAR dedicated storage + authorized people + register+ follower sheets
SCS Storage	Contamination, humidity	Bad environmental conditions, Bad packaging	- EUCL-CPP-DOC-7-002 : Cleanroom rules
SCS introduction in cryostat	- Mechanical shock - ESD Shock - Contamination	- Mounting/ demounting on focal plane - ESD - Bad cleaning	- Step by step procedure : ATRIUM-128918 - ATRIUM-120693 : ESD control procedure - EUCL-CPP-PR-7-004 : Equipment entry procedure in cleanroom - Cleaning procedure : ATRIUM-99597

SCS Risk Analysis

Operation	Risk	Cause	Action
SCS Characterization	Contamination	- Bad selection of material in cryostat - Vacuum default	- Molecular contamination control (witnesses)
	Electrical power shutdown (short, long)	Power outage	EUCL-CPP-TN-7-020 : Characterization Setup Study Report
	Thermal risks : unexpected temperature reached (too cool or too hot)	Lack of safety elements : bad control, human error, software bug	Cryostat safety tests procedure : ATRIUM -121495
Transport to LAM	Contamination, Deterioration	Bad conditioning, bad handling	Packaging procedure ATRIUM-130236 + authorized people

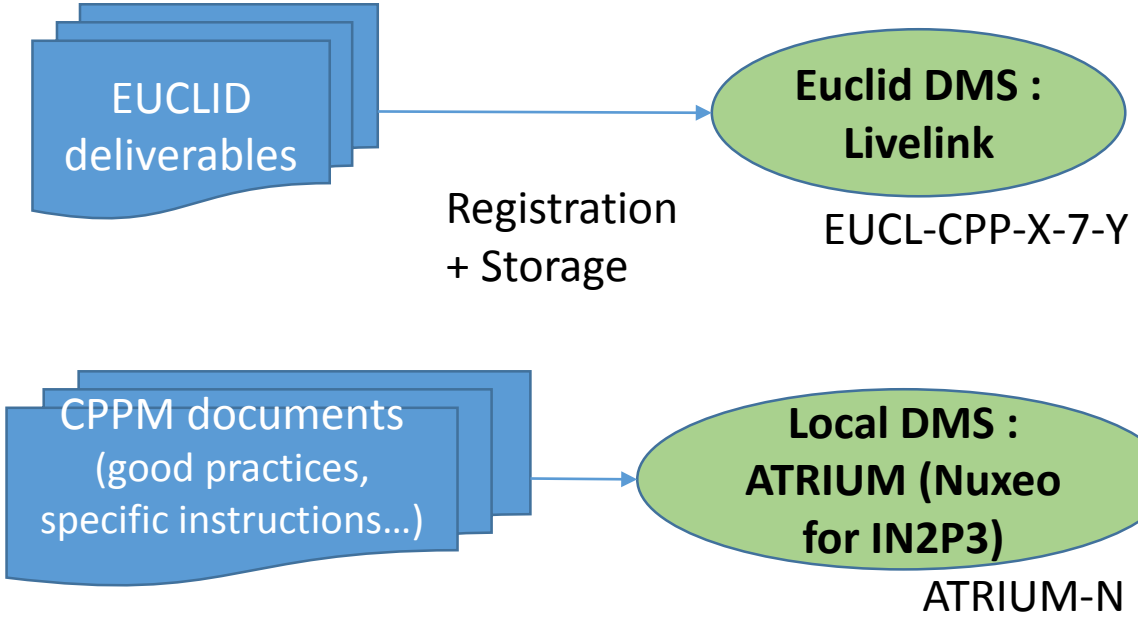
PAQA dispositions

General PAQA dispositions at CPPM

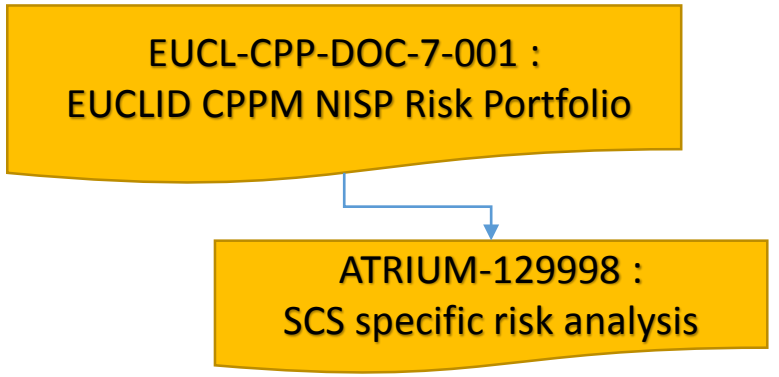
CPPM PAQA PLAN: EUCL-CPP-PL-7-001

- CPPM Documentation Control Plan EUCL-CPP-PL-7-005

→ 2 tools for Documentation Management



- CPPM Risk Management Plan: ATRIUM-60768



PAQA dispositions during detectors workflow

Incoming → Cleanroom entrance → Storage → Assembly on Focal Plane → Introduction into cryostat → CHARACTERIZATION

- Registration
- Unpacking
- Cleaning

Incoming Procedure : EUCL-CPP-PR-7-001

SCS Pictures Procedure EUCL-CPP-PR-7-009

Cleaning instruction ATRIUM-99597

- Cleaning process : Cleanroom rules
- ESD preventive protections (individual and environmental)

Cleanroom Material Entrance procedure EUCL-CPP-PR-7-004

Dedicated storage (closed shelves with IP 66 protection)

Mounting procedure + Authorized people

SCA FPA integration : ATRIUM-128918

Packaging and shipping

SCS packaging procedure ATRIUM-130236

Detectors' Environment controls

Personal training

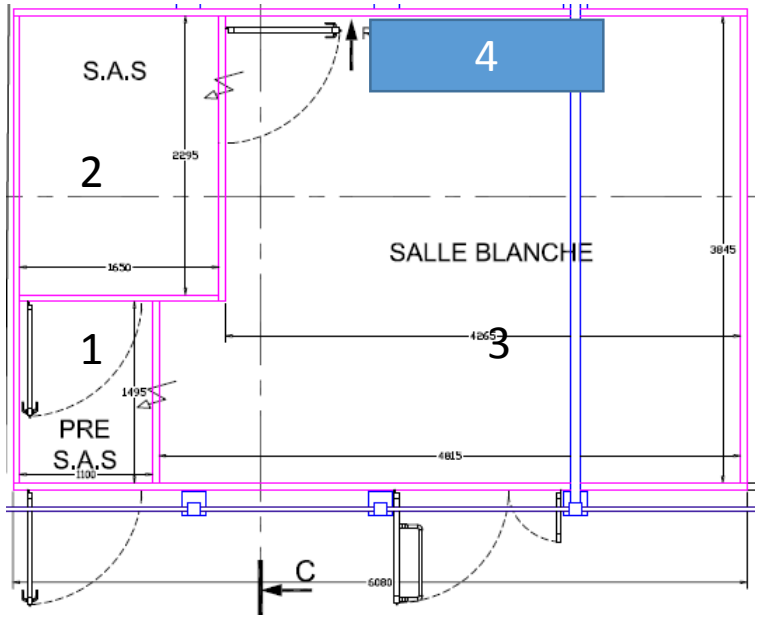
- Cleanroom operating training (external)

→Cleanroom rules : EUCL-CPP-DOC-7-002

Gowning/un-gowning procedure : EUCL-CPP-PR-7-003

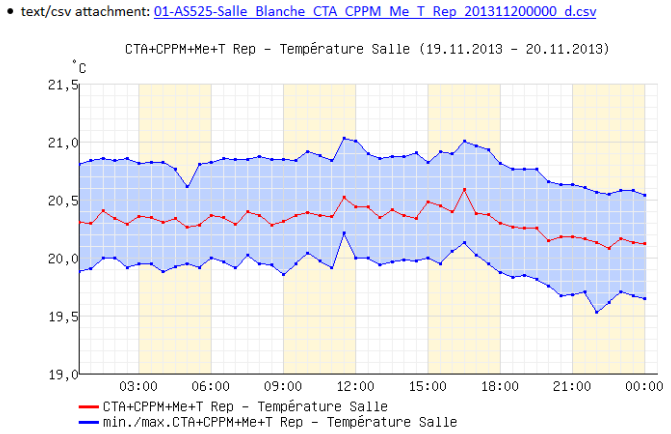
Cleanroom material entrance procedure (cleaning) : EUCL-CPP-PR-7-004

Environmental parameters Controls



- Cleanroom conception & equipment :
  - Controlled access : authorized people
  - Conception according ISO 14644 :
    - Personal (1) and Material (2) areas,
    - ISO 7 Cleanroom (3)
  - Equipment : ISO 5 Laminar Flow Hood (4)

- Cleanroom monitoring :
  - Control panel : Temperature, Humidity, Pressure
  - Monitoring with email alerts



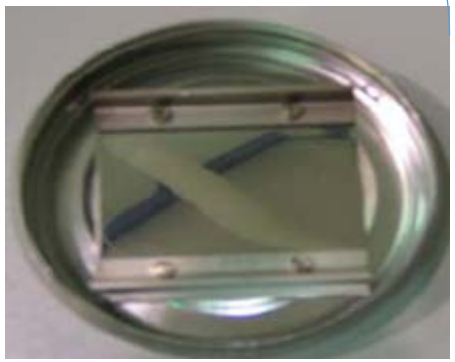
Contamination and cleanliness

- Cleanliness and Contamination Control Plan : EUCL-CPP-PL-7-007

Periodical cleaning: external subcontractor

Contamination monitoring procedure : EUCL-CPP-PR-7-005

AEROTRAK Particulate Counter



Contamination Witnesses handling procedure : EUCL-CPP-PR-7-006

Particulate contamination measurement campaign during detectors workflow

ENVIRONMENT

PAC : Particulate Contamination Witness

PAC #1 : "Reference witness": remains under the ISO 5 hood (35j)

4 ppm/d

PAC #2 : "almost detector follower" (14 days)

On the optical table (ISO 7)

Closed and Stored under ISO5 during characterization

Near the detector (ISO 7)

6,1 ppm/d

PAC #3 : "only cryostat" (41j)

2,7 ppm/d

PAC #4 : "only storage" : 1 day & 85 days

0-0,05 ppm/d

Molecular contamination measurement campaign during detectors workflow

ENVIRONMENT

Laminar Flow Hood (ISO 5) — Unpacking

Closed cupboard (inside ISO 7 Cleanroom) — Storage

Laminar Flow Hood (ISO 5) — Assembly on Focal Plane

Cleanroom (ISO 7) — Transfer into cryostat

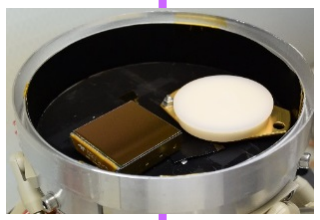
Vacuum — Characterization

Laminar Flow Hood (ISO 5) — Transfer to ISO 5 Hood, Packing

MOC : Molecular Contamination Witness

MOC #1 : "Reference witness": remains under the ISO 5 hood

MOC #2 : "detector follower" (14 days)



Results : Equiv hydrocrabonates, esters, silicones (g/cm²)

<0,2x10^{-07} g/cm²

<0,2x10^{-07} g/cm²

ESD control

- ESD Control Procedure : ATRIUM-120607

For all handling detectors' operation (Operators)

Individual Protection

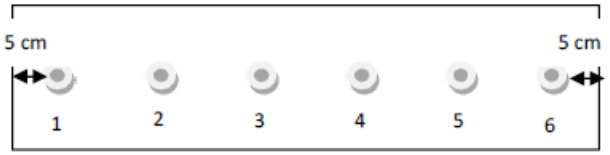
- Cleanroom clothes anti ESD : overshoes, suits, gloves

- Control with Test Station : Wristband + Overshoes

- Regular test of the writbands

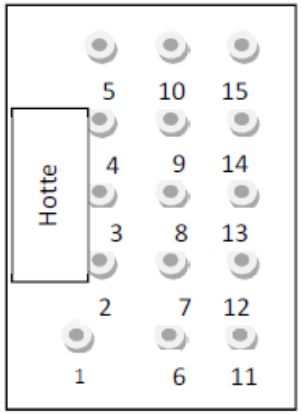
Before incoming test (PAM)

Working surface control



Results : [10^6 -10^9] ohms
→Dissipative

Floor surface control



Traceabilility

Incoming → Cleanroom entrance → Storage → Assembly on Focal Plane → Introduction into cryostat → Characterization → Shipping

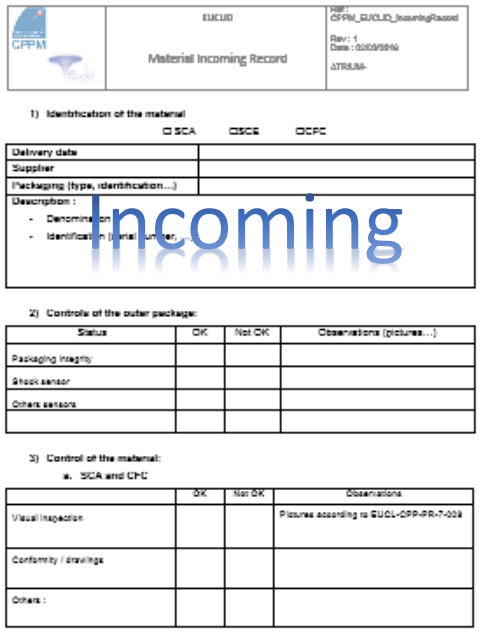
Incoming recording → EIDP → Follower sheet → Local register

LOGBOOK, NCR

Logbook User Manual: ATRIUM -128913

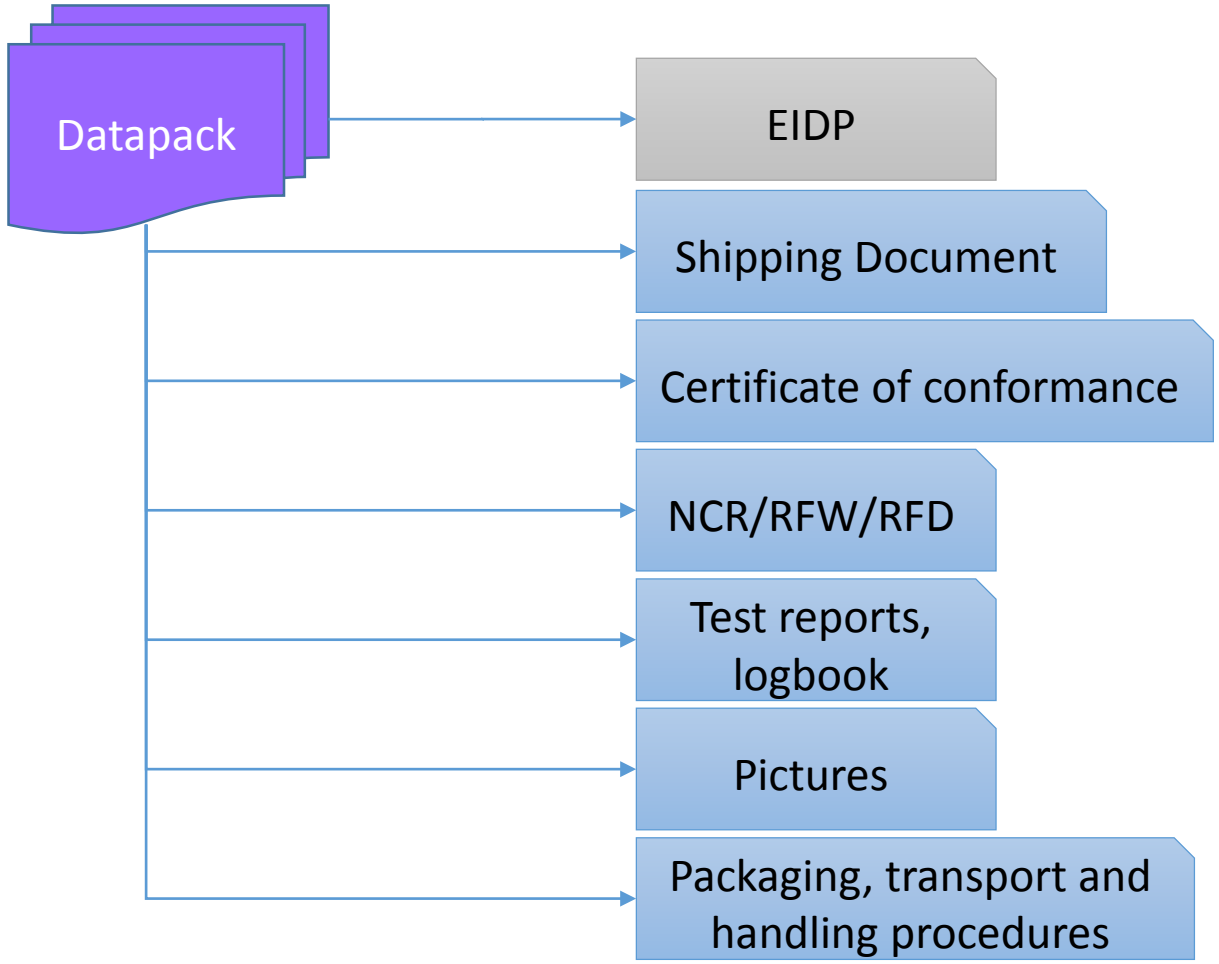
Logbook PR1 : ATRIUM -128914

Logbook PR1b : ATRIUM -128916



Shipping record → Datapack → Follower sheet → Local register

Datapack


Datapack
EIDP
Shipping Document
Certificate of conformance
NCR/RFW/RFD
Test reports, logbook
Pictures
Packaging, transport and handling procedures