CERAP UK
PREVENTION

The safety of operating staff.
The reliability of installations.

CERAP PREVENTION

DNA & capabilities

From construction to operation and decommissioning, CERAP Prevention and its subsidiaries support key players of the Energy sector in preserving the safety of workers and the reliability of installations.

Radiation Protection

Nuclear Safety

Support to Nuclear Operators

Since 1988

DESIGN OFFICE
Nuclear safety
Radiation protection

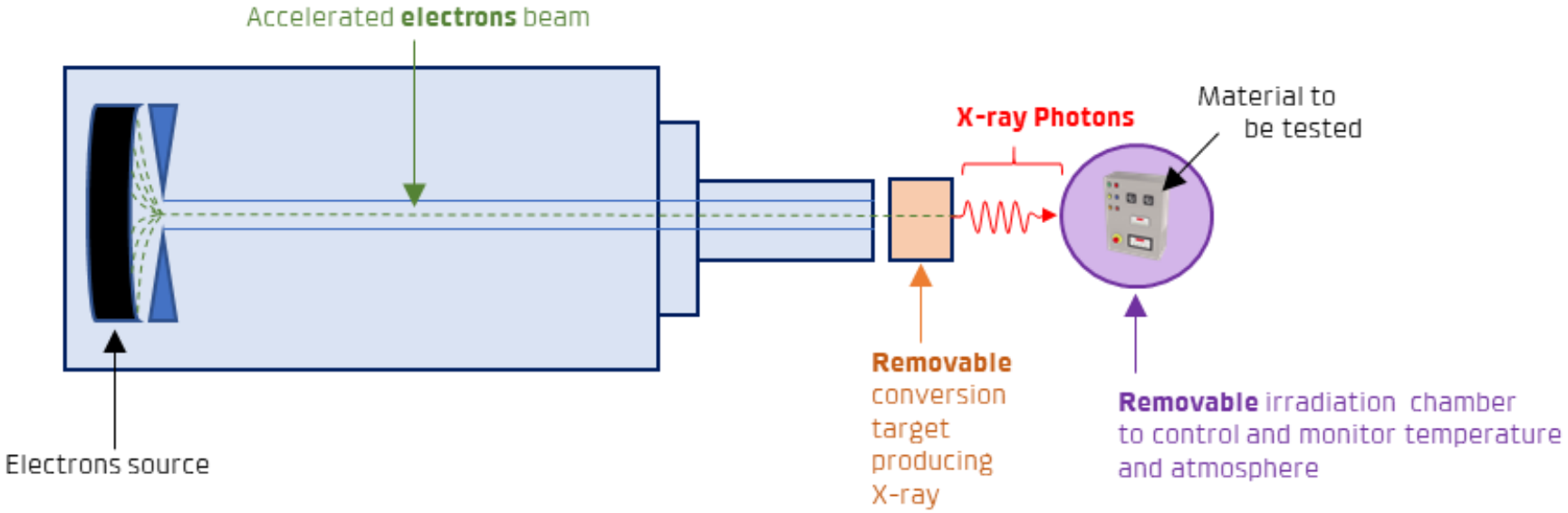
HVAC EXPERTISE
Filters system test
Gas and particle tracing

NUCLEAR MEASUREMENT
RP devices calibration – maintenance – rental
Accelerated aging under irradiation

NUCLEAR ENGINEERING AND CONSULTANCY
Provision of Designers – Engineers – Planners – Experts
On-site assistance (logistics, work coordination, commissioning…)

ATRON Metrology

Equipment - Singletron 3,5 MeV HVE



ATRON Metrology

Equipment - Singletron 3,5 MeV HVE

Felix accelerator

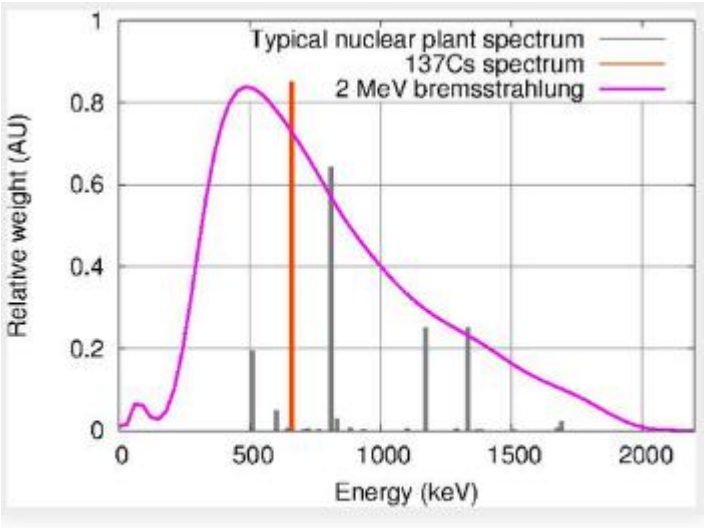
ATRON Metrology
Benefits

Advantages of ATRON's method

- Modular wide energy spectrum, **more representative and 'envelope' of radiological environment**
- Radioactive source-less, for a **higher level of nuclear safety and avoid radioactive waste**
- Alternative method that brings **more availability as few installations** exist in Europe
- **Competitive solution**

Automation

- Definition of irradiation sequences ⇒ reduction of the risk of error
- Saving time ⇒ reduction of the immobilization time of the material.



Simulation Bayeux/Geant4

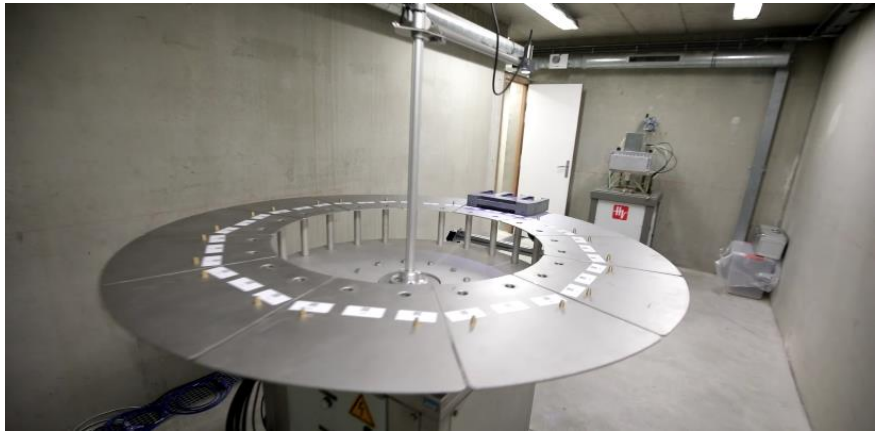
ATRON Metrology

Technical characteristics

- Electrostatic accelerator:
  continus beam
- Removable X conversion target:
  Radiation testing with X-ray or e-
- Energy range:
  0.2 - 3.5 MeV
- Current:
  ~1 pA - 1 mA
- Maximum X-ray dose rate at 1 m:
  0.1 µGy/h - 500 Gy/h
- Maximum electrons dose rate:
  up to 10 kGy/s
- Temperature:
  From -200°c to +300°C
- Atmosphere:
  Vacuum or various gases (Ar, N2, Air, etc)

Electronic devices can be monitored during radiation testing

For small equipment
Irradiation chamber
to 150x150mm



For large equipment – irradiation room 3x6m

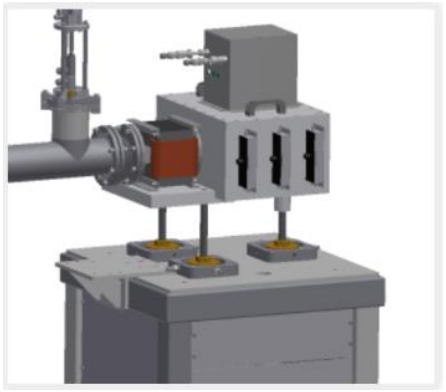
ATRON Metrology

More technical characteristics

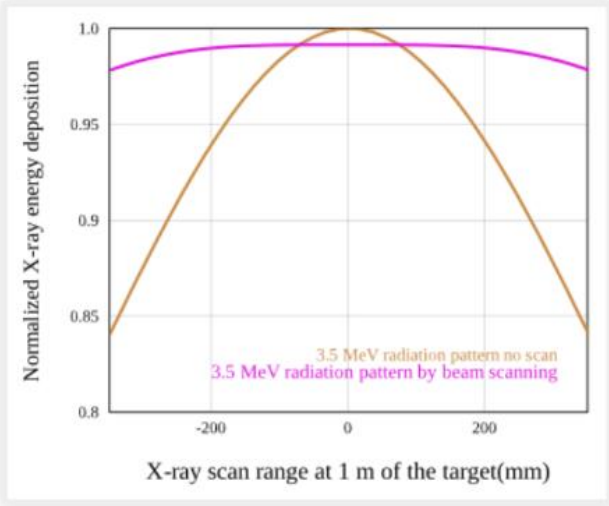
Radiation field uniformization

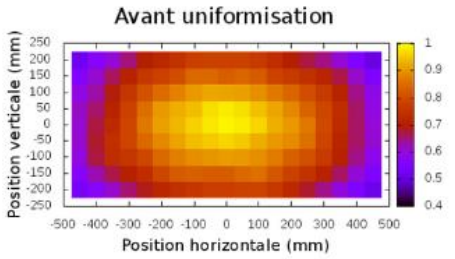
Definition of a scanning function on the target

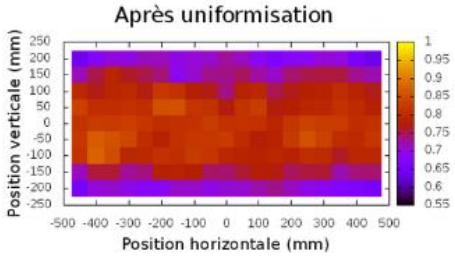
- Dimensions of the target: 40x220 mm2
- Vertical scanning: 1 kHz
- Horizontal scanning: 25 Hz



Homogeneity of the irradiation field: up to 99,8% on +/-15°





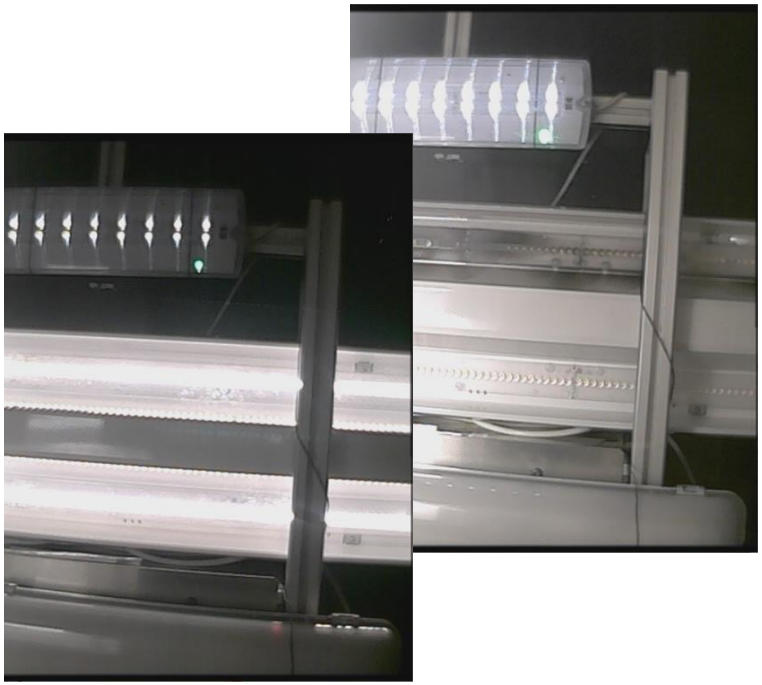


ATRON Metrology

Previous achievements

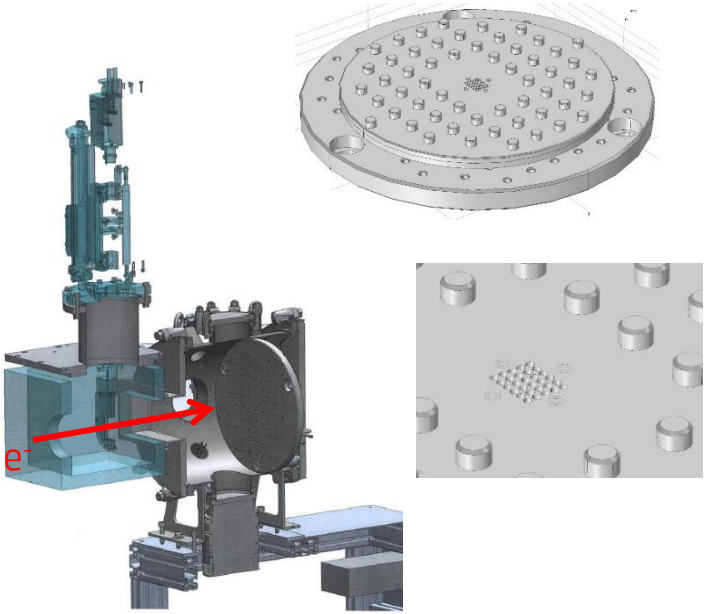
Radiation testing for LED luminaires to verify functionning for 10 years in NPP

- X-Ray radiation testing up to 9 kGy in air (red zone)
- Equipment powered during irradiation, monitored with a camera



Microstructural evolution of steels under irradiation

- Irradiation e-, 2 MeV, 1 mA of 30 samplings ø 3 mm
- Reproduction of the dose received by a PWR tank in 40 years (= 0,1 dpa)



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