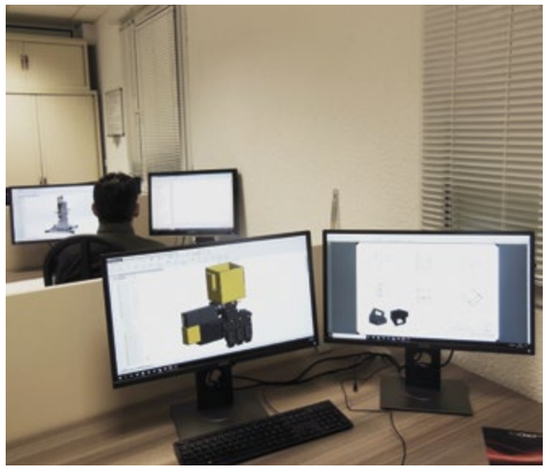
Optique Peter

OPTICAL & MECHANICAL ENGINEERING

HOT LABS EQUIPMENTS



Design

Mechanical Workshop

Integration

Commissioning – Maintenance – Calibration

Summary
Hot Labs Equipments

GLOVE BOX EQUIPMENT

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HOT CELL EQUIPMENT

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Glove Box Microscopes
Microhardness testers

Motorised nosepiece with micro hardness tester

INVERTED / UPRIGHT METALLURGICAL MICROSCOPES

- Light and image paths adapted to the glove box
- Modular elements for introduction by traps and assembling inside glove box
- Binocular head available outside glove box
- Motorised functions :
  - Z focusing
  - XY stage
  - 5/6 objectives nose piece
  - 360° rotatable specimen support
- Integrated microhardness tester on nosepiece
- Manual or PC commands
- Microhardness Monitoring / Measure

References : CEA, ORANO MELOX

Upright microscope

Inverted microscope

Microhardness Tester

Glove Box Stereomicroscope
and macroscopes

Shielded Zoom stereomicroscope & motorized 3 axis heavy stage

Stereomicroscope trinocular head & digital camera

Lead shielded glove box – Stereo microscope & SLR control cabinet – image analysis

References : CEA Marcoule – EDF-LIDEC

Glove box macroscope

Glove Box
Wire Saw

MOTORIZED GLOVE BOX WIRE SAW

- Cutting head mounted on air bearings
- 2 axis motorized sample support
- Stainless steel frame for corrosive environment
- Optical barrier for operator safety
- Earthquake resistant frame
- Modular design for glove box maintenance

References : CEA Marcoule

Glove Box Raman
Spectroscopy Microscopes

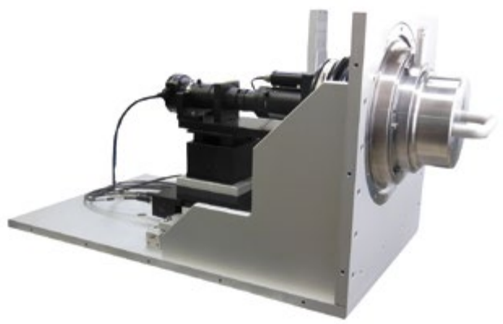
CHARACTERISTICS

- Glove box Raman spectroscopy video microscope

- Up to 3 different laser wavelengths
- Reflected light illuminator for bright field observation
- Laser excitation and Raman signal transmitted by optical fibres
- Motorised nosepiece with 6/8 objectives
- Motorised focusing
- Motorised stage
- Sample loading system

References : CEA Saclay, CEA Marcoule

Glove Box Alpha
Autoradiography



CHARACTERISTICS

- Alpha emitters cartography
- High efficiency and high resolution scintillators
- Motorized zoom and translations
- Motorized sample rotation
- Image analysis

References : CEA Marcoule, Orano Melox

Hot Cell Inverted
Microscopes

Radiation hardened microscope nosepiece
6 objectives and 2 micro hardness testers

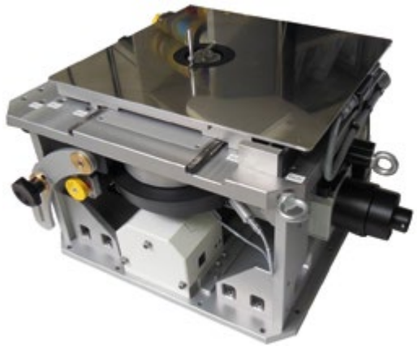
INVERTED METALLURGICAL MICROSCOPE

- Light and image paths adapted to the cell dimensions (cell type : Concrete, Lead, Steel, wall thickness)
- Trinocular head, video ports
- All functions Motorised
- Observation : Bright Field, Dark Field, Polarisation, DIC...
- Motorised Field and aperture iris
- Motorised 8 positions nosepiece :
  - 6 objectives / 2 micro hardness sensors (Vickers & Knoop)
  - 7 objectives / 1 micro hardness sensor
  - 8 objectives
- Micro hardness system, control unit outside the cell
- 3 axis X Y Theta stage
  - Up to 100 mm diameter specimens
  - Up to 100 x 200 mm travel with parking position for protection against radiations
  - 360° rotatable motorised specimen support
- Halogen/Led lamp outside the hot cell
- PC control with image analysis / manual control

References : CEA Saclay, CEA Cadarache, EDF-LIDEC, KIT-IAM (Germany), INM (Russia)

Concrete hot cell microscope

Steel hot cell – alpha box



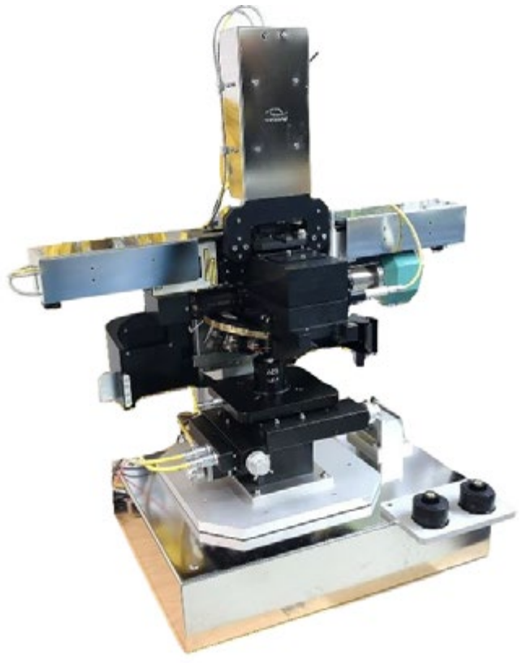
Video microscope (shielded camera)

Hot Cell Raman
Spectroscopy Microscopes

UPRIGHT RAMAN MICROSCOPE, FULLY HANDLED BY TELEMANIPULATOR

- Assembly and maintenance with telemanipulator (For Hot cells without operator access)
- Radiation hardened design
- Observation : Bright Field, Dark Field, Polarisation
- Motorised nosepiece with 6/8 objectives and up to 2 MHTVK microhardness testers
- 4 axis X Y Z Theta stage
- Laser excitation and Raman signal transmitted by optical fibres from laser and to spectrometer located out of the hot cell

Reference : CEA Marcoule



UPRIGHT RAMAN MICROSCOPE WITH 3 WAVELENGTHS

- Observation : Bright Field, Polarization
- Up to 3 different laser wavelengths
- Laser excitation and Raman signal transmitted by optical fibres from lasers and to spectrometer located out of the hot cell
- Motorised nosepiece with 6/8 objectives and up to 2 MHTVK microhardness testers
- 4 axis X Y Z Theta stage
- Sample loading system

Reference : NNL

Hot Cell
Macroscopes

MOTORISED VIDEO MACROSCOPES

- Zoom 12 x
- Goniometric and standard vice
- Annular and co axial lighting
- Darkfield and transmitted light
- Computer control : XY stage, zoom and focus
- Modular design for remote maintenance

References : CEA Saclay, CEA Cadarache, EDF Chinon

Hot Cell
Optical Profiler Microscopes

MOTORISED VIDEO MACROSCOPES

- Non contract 3D scanning
- Piezo scanner with feedback loop
- Motorised focus
- Motorised XY stage
- White or monochromatic light source
- Interferential objectives (SIMS Crater measurement)

References : ITU Karlsruhe

Hot Cell
Periscopes & Endoscopes

Watertight periscope
Nuclear fuel position control
Reference: EDF

HIGH RESOLUTION APOCHROMATIC PERISCOPE

- Mirror optics allowing true colour restitution (No coloured radiation hardened glasses)
- 2 magnifications
- Binocular, digital camera, 3 CCD video
- 3 axis motorised stage in hot cell with lamps
- Computer control & image analysis

Reference : CEA Saclay

Binocular endoscope
Bores / tapping control for PWR
Reference: EDF, Framatome

Hot Cell
Binoculars

BINOCULAR FOR MACROSCOPIC OBSERVATION IN HOT CELLS

- Compensation of the optical aberrations of thick hot cell radiation resistant glasses
- Adjustable stereoscopic observation angle according to focusing distance, allows fine stereoscopic observation from 1,5 m to infinite
- 10x, 14x, 20x and 28x magnification with different oculars
- Heavy duty tripod on dolly

Hot Cell
Illumination & Accessories

- Radiation hardened optical fibres
- Radiation hardened optical windows
- Flexible / annular / spot illumination
- Remote manipulated airtight optical fibres connectors

Hot Cell
Remote Manipulated Video Cameras

Ultrasonic
Disc Cutter

Hot Cell
Electro Pointer

Hot Cell
Vacuum Carbon Coater

Hot Cell
Polishing Machine

Hot Cell
Mounting Press Adaptation

Hot Cell
Cut-off machine adaptation

Other activities

SYNCHROTRONS

MICRO-ELECTRONICS

SPECTROSCOPY

OPTICAL COMPONENTS

MAINTENANCE

SPECIAL MICROSCOPES

Design by artenium - 06/2019

Our fields of activity

ENGINEERING

- Nuclear Hot Laboratories
- Nuclear Glove Boxes
- X-Ray and Neutron Imaging
- Microscopy - Spectroscopy
- Research - Medical - Vision
- Instrumentation - Measurement

SERVICES

- On-site maintenance
- Workshop repair
- Calibration
- Equipment modification
- Training Sessions

Contact

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