



INDUX center
IBA Industrial User eXperience



Practice
Makes Perfect.

INDUSTRIAL
SOLUTIONS

A user experience center to maximize your talent, share your experience, optimize your knowledge.

Introduction

These centers are not only training centers, but also a **place of collaboration** where people with different missions can meet and exchange ideas so everyone's expertise will grow.



The sites

We welcome our trainees into an environment equipped with both the latest equipment, and our legacy systems. This allows us to provide them with an optimal and more immersive experience.

The goal

Our priority is to ensure that people working on IBA equipment achieve a high level of technical skills. We want to help them to be as empowered as possible so that they can make the right decisions and take the right actions.

We are pleased to welcome you at our two centers:

- INDUX Center Europe
- INDUX Center Americas*

* Basic 1 only, as of the end of 2026

More info and registration on our website: <https://www.iba-industrial.com/customer-care/#indux>

Objectives

01 Optimizing Field Service Engineer (FSE) time for continuous improvement while at the IBA factory.
→ **100% FSE have started their training**

02 Striving for technical excellence for employees and customers.
→ **In-depth training plan has been established**
→ **Remote and hands-on training with experienced trainers**

03 Helping customers to improve uptime thanks to well-trained operators.

04 Providing remote support for customers.

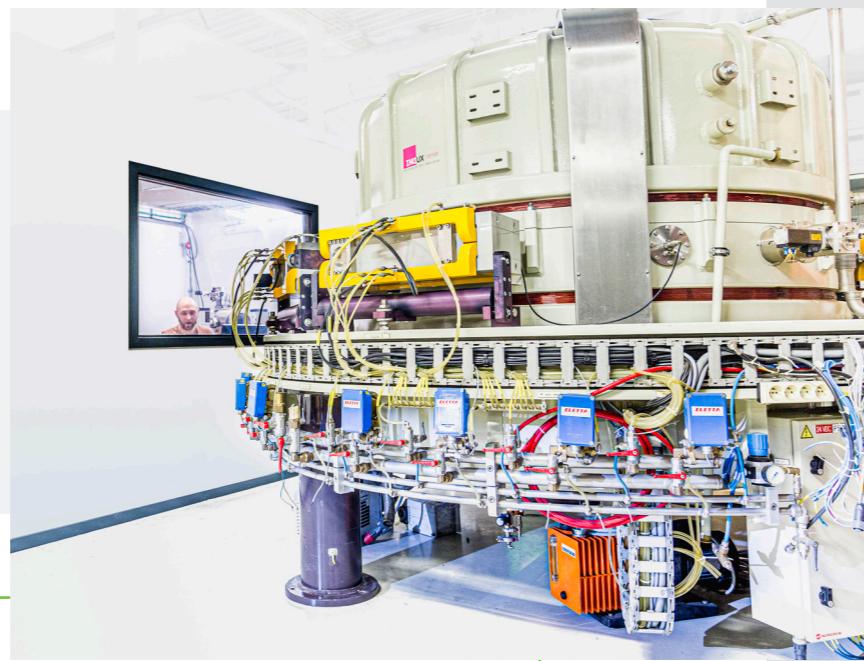
05 Developing new features for R&D.



Rhodotron® Cavity

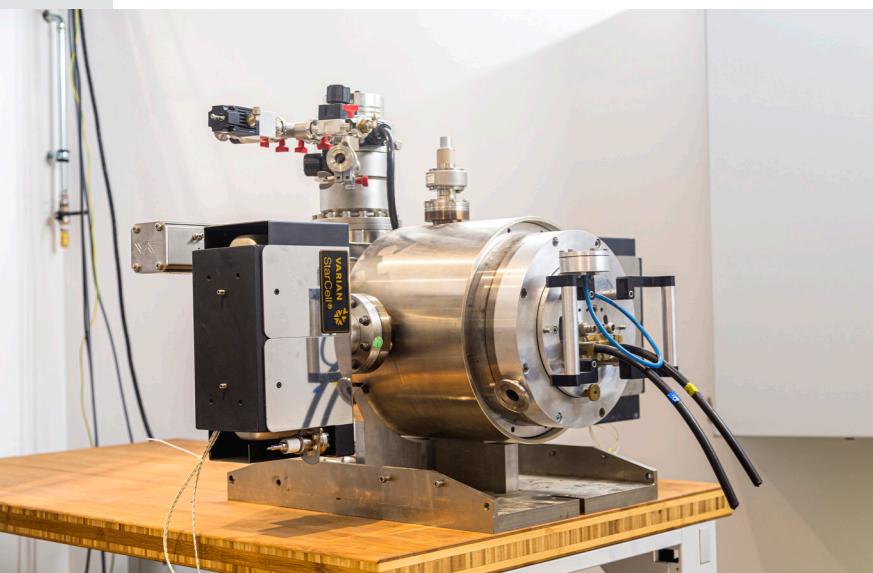
You will have the opportunity to practice on a real cavity and visualize all the elements composing it.

- Measuring the resonance frequency of the cavity with a network analyser
- Adjusting electromagnets
- Purging the cooling system
- Checking the flowswitch state



E-Source

The **E-source** is under high vacuum as on real machines.



- Replacing the cathode
- Using a leak detector and solving the problem
- Restoring the high vacuum
- Degassing, HV conditioning, reactivating the cathode
- Calibrating the Bergoz and the Fil/Grid power supply

RF

You will work with a **powered RF chain** from the LLRF to the cavity.



- Performing a dielectric test on a vacuum tube and tuning the vacuum tube power supply parameters to adjust the gain and the rest current



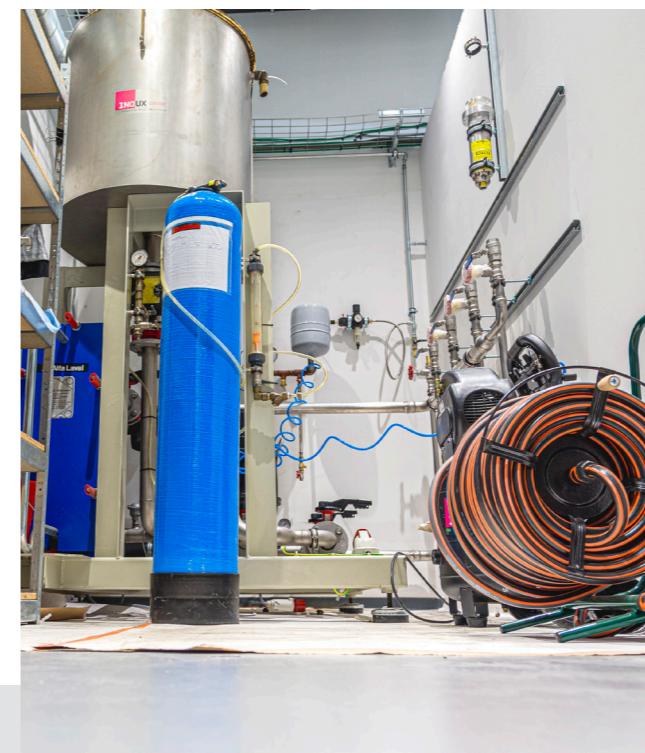
- Measuring the RF signals and checking the frequency matching with a network analyzer



- Starting the LLRF in continuous or pulsed mode, measuring the signals with the multimeter and observing them with an oscilloscope

Water Group

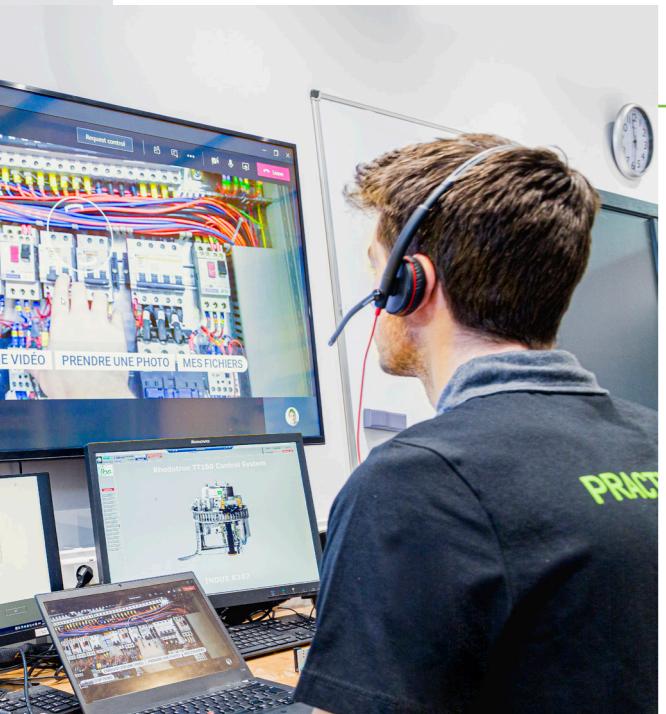
You will operate a **real water group** controlled by the PLC.



- Controlling and troubleshooting the deionized water group with the user interface
- Testing the deionized water properties

HMI & Remote Support

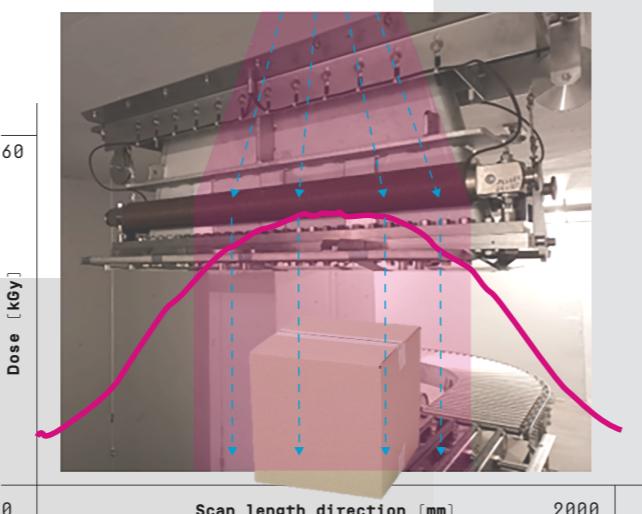
You will use the **HMI** to interact with the **ACS** through the **PLC**.



- Navigating in the different views
- Understanding the PLC – hardware links by measuring signals on cables
- Troubleshooting a real fault with HMI first interlock and beam history
- Learning good practices for remote troubleshooting with IBA FSEs

Irradiation Dosimetry Basics

- Configuring the production parameters in Beagle to understand E-beam/X-ray dosimetry basics and the dosimetry measurement theory
- Measuring the energy on a strip to evaluate the e-beam energy (CTA strip measurement)
Possible collaboration with Aerial



INDUX Center offers a series of training courses, divided in levels Basic 1 & 2 and Advanced 1 &2.

In order to guarantee the most successful outcome of the sessions, it is strongly recommended that the **participants have previously trained and fulfilled the prerequisites** described in the manuals received with the Rhodotron®, namely the operators, maintenance and description guides.

It is also strongly recommended that participants have good electrical and mechanical skills.

Safety First: All safety aspects will be reminded during the training week.

At the end of the training session an attendance certificate will be given to the participants.

Training catalog.

Rhodotron® Cavity

TOPICS	BASIC	ADVANCED	THEORY	PRACTICE
Power supplies basics	X	-	X	-
Overview	X	-	X	-
E-beam and X-ray physics basics	X	-	X	-
Wiring list theory	X	-	X	-
BOM theory	X	-	X	-
Electrical system - Basic material and tools	X	-	-	X
Mechanical tools, connectors and use	X	-	-	X
General tasks training for a preventive maintenance	X	-	-	X
Magnetic circuit	-	X	X	-
Deflection magnets tuning	-	X	-	X

E-source

TOPICS	BASIC	ADVANCED	THEORY	PRACTICE
Vacuum theory	X	-	X	-
Vacuum pump replacement	X	-	-	X
E-Source cathode replacement	X	-	-	X
Bergoz calibration	X	-	-	X
E-Source magnet tuning	X	-	-	X
TPG parameters setting	X	-	-	X
E-source - Theoretical training	-	X	X	-
E-source, PS and control boards replacement/calibration	-	X	-	X
E-source oil and capacitor replacement	X	-	-	X
E-source resonator PCB replacement/tuning	-	X	-	X

RF

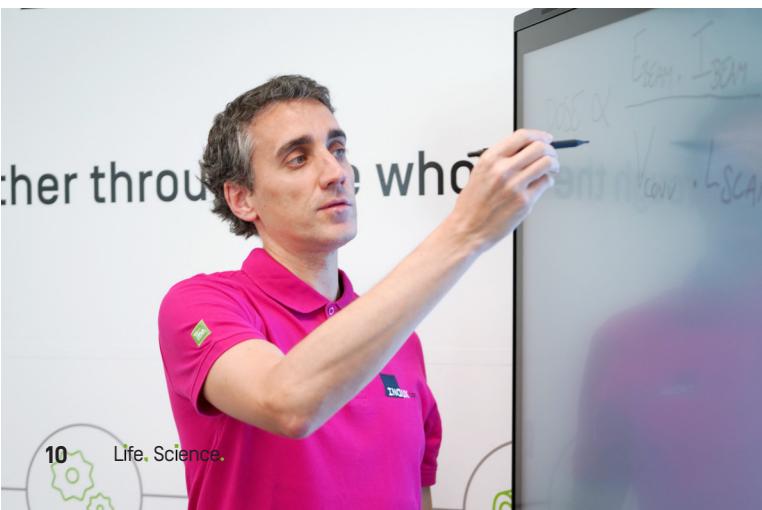
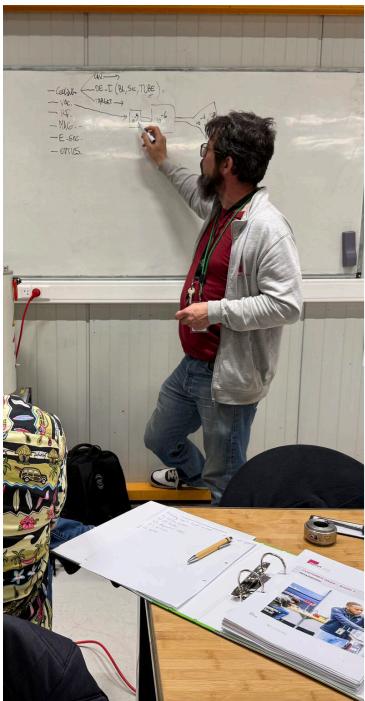
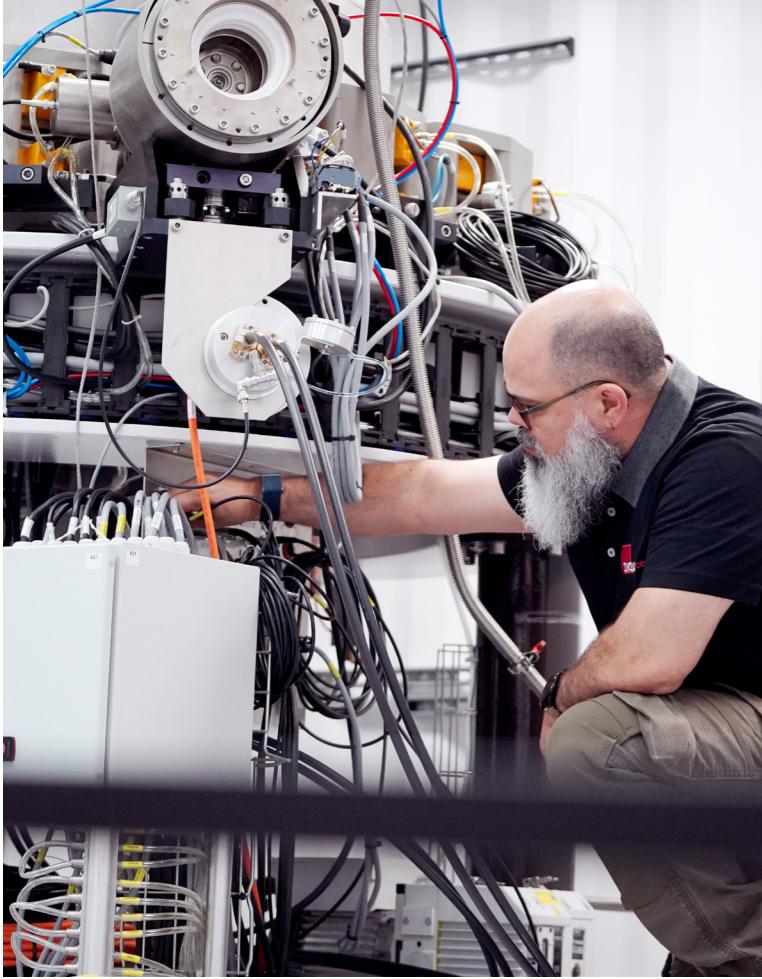
TOPICS	BASIC	ADVANCED	THEORY	PRACTICE
Radio Frequency (RF) - Introduction	X	X	X	X
Driver tetrode replacement	X	-	-	X
FPA tetrode replacement	X	-	-	X
Network analyzer and oscilloscope practical training	X	X	-	X
LLRF theoretical training	-	X	X	-
RF chain	X	X	X	X
Pre-driver replacement and tuning	X	-	-	X
Pick up tuning (LLRF and E-Source)	-	X	-	X
FPA kapton replacement	X	-	-	X
Electron vacuum tube testing	X	-	-	X

Water group

TOPICS	BASIC	ADVANCED	THEORY	PRACTICE
Circuit purging of the cooling system	X	-	-	X
Troubleshooting water group with HMI	X	-	-	X
Testing the deionized water properties	X	-	-	X

HMI

TOPICS	BASIC	ADVANCED	THEORY	PRACTICE
Software – User interface training	X	-	-	X
Advanced HMI use	-	X	-	X



A Typical training week - Basic level 1.

DAY 01	AM General introduction and overview of the equipment PM Properties and identification of the main materials of the Rhodotron system, good practices with mechanical tools and assemblies
DAY 02	AM Vacuum: vacuum systems description, dangers, typical failure, practical exercises, servicing and changing vacuum pumps PM Vacuum: programming of TPG controllers and description of the corresponding thresholds, leak detection and vacuum troubleshooting
DAY 03	AM E-source: working principle, structure and components, e-beam control, dangers, typical failure; hands-on: cathode replacement PM E-beam and X-ray irradiation: principles and physics [introduction]. Exercises: oscilloscope, user interface and electrical cabinets
DAY 04	AM Cable identification and cable making Electrical measurements and troubleshooting: illustration on the Scanning Magnet Power Supply Analysis of power supply components and wiring troubleshooting exercise. PM Magnetism: hands-on exercise with a deflection magnet
DAY 05	AM E-source: regeneration & high voltage conditioning PM E-source: oil and capacitors replacement & magnets tuning

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ABOUT IBA

IBA (Ion Beam Applications) is a global medical technology company focused on bringing integrated and innovative solutions for the diagnosis and treatment of cancer. The company's expertise lies in the development of next-generation proton therapy technologies and radiopharmaceuticals that provide oncology care providers with premium quality services and equipment, including IBA's leading fully-integrated IntegraLab® system.

ABOUT IBA INDUSTRIAL

IBA INDUSTRIAL is the world leader in electron and proton accelerators for industrial applications and supplies end-to-end irradiation solutions.

IBA's unique E-beam, X-ray and Proton treatment solutions are used across the world in many different applications such as medical device sterilization, food pasteurization, property enhancement for various materials, etc.

IBA Industrial supplies end-to-end irradiation solutions from site planning and optimization, engineering and integration of all operational sub-systems to assistance in operation.

IBA GROUP

IBA delivers solutions of unprecedented precision in the fields of cancer diagnosis and therapy. The company also offers sterilization and ionization solutions to improve the hygiene and safety of everyday life.

IBA, a Belgian company, is listed on the PanEuropean stock exchange EURONEXT.

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