AMMO Imaging

For future perspectives

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ABOUT US

AMMO Imaging is an Italian company founded by experts with over 20 years of experience in the radiopharmaceutical industry.

Established in 2021, we specialize in providing innovative solutions and comprehensive services to support the production, maintenance and quality assurance of radiopharmaceuticals.

Recognizing the rapid progress in technology and the continuous evolution of radiopharmaceutical and pharmaceutical products, we are committed to improving and expanding the facilities with which we collaborate. This focus enables us to achieve superior reliability and quality while maintaining the highest standards of compliance and productivity.

At AMMO Imaging, we are consistently involved in projects designed to bring forward innovative products and solutions tailored to the radiopharmaceutical industry's needs.

SERVICES

Design & Startup

Validation

Project Management

Quality

Maintenance

Radiopharmaceuticals made easy:
all services, one provider.

SERVICES

Design & Startup

Facility design, layout optimization, and process improvement supported by the expertise of our specialized personnel in radiopharmaceutical production.

Optimization of production processes ensuring that operations align with best practices and industry standards.

Validation

We manage the entire qualification process of equipment (IQ/OQ/PQ) according to GMP standards, and provide cleanroom qualification and installation services

SERVICES

Quality

Comprehensive assistance for drafting Protocols, Risk Assessments, and Standard Operating Procedures, including associated forms.

Project Management

End-to-end project management for radiopharmaceutical sites ensuring timelines, budgets, and GMP compliance

SERVICES

Maintenance

Thanks to the certified know-how of our experts gained over several years in the radiopharmaceutical industry, AMMO can guarantee highly reliable preventive/corrective maintenance services with short downtime for Cyclotron, Synthesizer, Hot-cells and Dispensing unit.

Cyclotron relocation and decommissioning

We manage the full decommissioning and relocation of cyclotrons, from dismantling and radiation safety to transport and recommissioning ensuring compliance, efficiency, and minimal downtime.

NHC-Liquid target

Multi Purpose Liquid Target

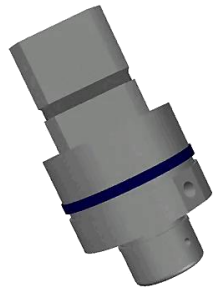
Performances

High productivity up to all target-current scale and for all target-life (up to 15.000 uA).
High pressure resistance up to 120 uA/h for 18F and up to 80 uA/h for other radio-isotopes.

Key features

^{18}F ^{68}Ga ^{61}Cu ^{64}Cu ^{89}Zr

Fully compatible with commercial Cyclotron
Adaptable for other types of Cyclotron
No He-cooling utilities needed
Single window foil targetry
Multiple isotope supported target



NHC-Liquid target

Multi Purpose Liquid Target

AMMO Liquid Target Radioisotopes

	^{18}F
Half-life	109min
Target Reaction	$^{18}O[p,n]^{18}F$
Target Material	^{18}O
Beam Energy [MeV]	18
Radioactivity @EoB 110µAh	15500 mCi 2.5h

	^{61}Cu	^{64}Cu	^{68}Ga	^{89}Zr
Half-life	3.33 h	12.7h	67min	78h
Target Reaction	$^{nat}Ni[p,x]^{61}Cu$	$^{64}Ni[p,n]^{64}Cu$	$^{68}Zn[p,n]^{68}Ga$	$^{89}Y[p,n]^{89}Zr$
Target Material	^{nat}Ni	^{64}Ni	^{68}Zn	^{89}Y
Beam Energy [MeV]	17	14	12	15
Radioactivity @EoB 60µAh	85 mCi* 3h	100 mCi* 3h	350 mCi* 1h	20 mCi* 3h

*Results dependent on starting stable isotope concentration. Values reported are for low concentration solutions.

SLT Target

Solid Liquid Target

Brief Description (1/2)

The SLT system is a solid target that includes an optimized water-cooled design ensuring efficient thermal management by dissipating the heat generated during irradiation.

An integrated elution system is built into the target, facilitating immediate extraction of the produced radionuclide without manual intervention.

The SLT system is linked to a target-radiopharmacy transfer system that securely transports the eluted solution directly to a radiopharmacy, minimizing handling and exposure risks.

SLT Target

Solid Liquid Target

Brief Description (2/2)

The SLT system does not require helium-cooling utilities, streamlining maintenance and reducing operational complexity.

It also supports multiple irradiation cycles, maximizing productivity by allowing repeated use without significant downtime.

These features make the SLT target system ideal for high-demand radiopharmaceutical production environments, combining efficiency, safety, and adaptability for various irradiation processes.

SLT Target

Solid Liquid Target

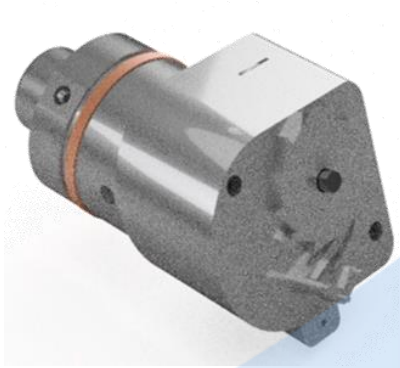
Performances

Combines solid target efficiency with liquid target convenience in one compact target body.
Multiple radio-metals production in one single target with in-situ dissolution

Key features

^{64}Cu ^{68}Ga ^{86}Y ^{89}Zr ^{124}I ^{121}I ^{99m}Tc

Fully compatible with commercial cyclotrons
Adaptable for all types of cyclotrons
No He-cooling utilities needed
Multiple isotope supported target



SLT Target

Solid Liquid Target

Performances

	^{64}Cu	^{68}Ga	^{86}Y	^{89}Zr	^{99m}Tc	^{123}I	^{124}I
Half-life	12.7h	67min	14.7h	78h	6h	13.2h	4.18d
Target Reaction	$^{64}Ni[p,n]^{64}Cu$	$^{68}Zn[p,n]^{68}Ga$	$^{86}Sr[p,n]^{86}Y$	$^{89}Y[p,n]^{89}Zr$	$^{100}Mo[p,2n]^{99m}Tc$	$^{123}Te[p,n]^{123}I$	$^{124}Te[p,n]^{124}I$
Target Material	^{64}Ni	^{68}Zn	^{86}Sr	^{89}Y	^{100}Mo	^{123}Te	^{124}Te
Beam Energy [MeV]	14	12	18	15	18	15	15
Extraction method	Wet chemical process separation	Wet chemical process separation	Wet chemical process separation	Wet chemical process separation	Wet chemical process separation	Dry distillation (oven required)	Dry distillation (oven required)
Radioactivity @EoB 60µAh	800 mCi 3h	5000 mCi 1h	150 mCi 2h	400 mCi 3h	1000 mCi 3h	800 mCi 6h	200 mCi 6h

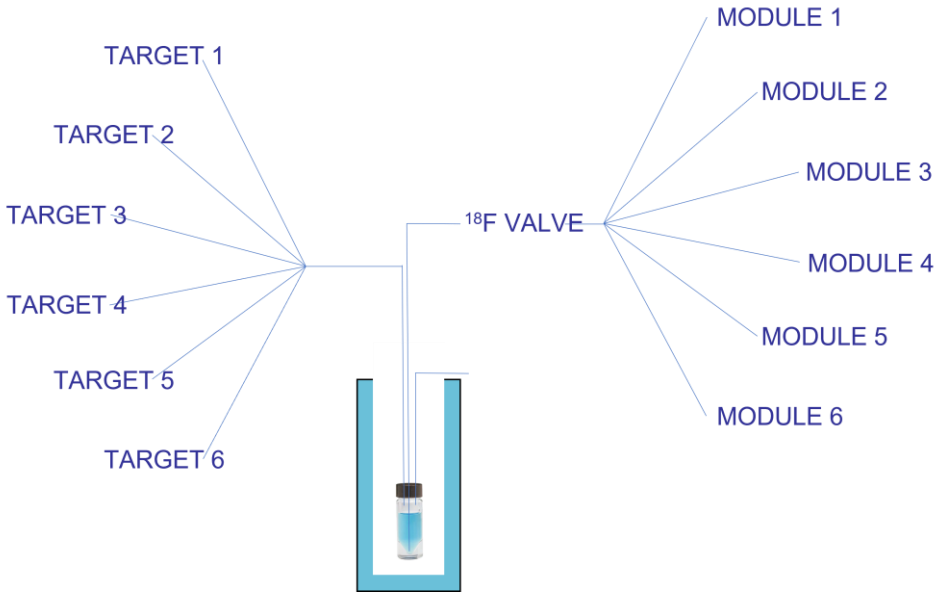
VITRU

Visual Interface & Transfer of Radioisotope Unit

Product Description

Up to 6 or 8 targets to different synthesis cells.

Compatible with all types of cyclotrons, synthesis cells, modules, and dispensing systems controlled by an independent, user-friendly HMI.



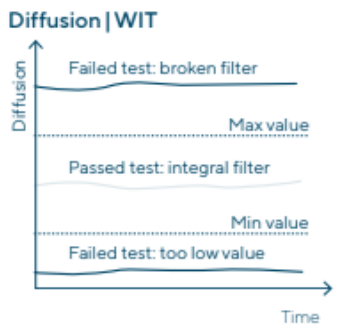
VITRU

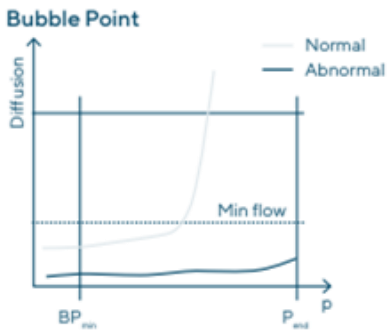
Visual Interface & Transfer of Radioisotope Unit

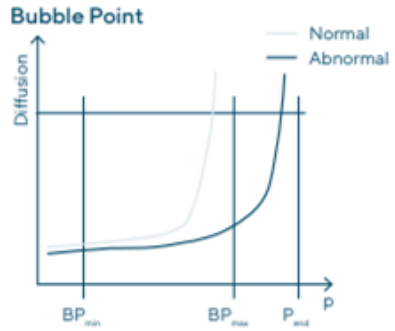
Bubble-Point Test Unit

As a key component of sterility assurance, the filter integrity test is critical for batch protocols and drug release.

The Radioisotope Transfer System Unit performs bubble point tests (BPT) and detects anomalies through an automated program, using air, nitrogen or helium pressure.







VITRU

Visual Interface & Transfer of Radioisotope Unit

Radioactivity Measurement Unit

The Radioisotope Transfer System Unit enabling direct measurement of incoming radioisotope activity in an ionization chamber.

Thus, can be helpful for measuring incoming radioactivity and calculating key factors of the process (saturation yields, synthesis yields, etc..).

VITRU

Visual Interface & Transfer of Radioisotope Unit

Inert Gas Mixing Unit

Inert gas mixing unit to ensures proper mixing of radiopharmaceuticals directly into your dispensing unit.

Washing System Unit

Cleanliness and longevity of the whole radioisotope transfer system with integrated rinsing system.

VITRU

Visual Interface & Transfer of Radioisotope Unit

Performances & Quality

The process is managed by control software with Multi-User Level Access.

The system complies with European Pharmacopoeia requirements, with 21 CFR Part 11 and FDA guidelines for data integrity and cGMP compliance.

It features a write-protected root file system for virus protection and is designed according to ALCOA+ principles.

OTHER PRODUCTS

Consumables

Our selection of consumable items for the pharmaceutical and radiopharmaceutical industry:

- Stable isotopes ^{18}O, ^{68}Zn, ...
- Glass vials for small filling operation
- Kit dispensing

OTHER PRODUCTS

Shielded containers

Designed for safe storage and transport of radiopharmaceuticals, ensuring radiation protection and compliance with transport regulations.

Shielded Tungsten Syringes

High-density shielding for safe injection of radiopharmaceuticals, combining operator safety with ease of use.

OTHER PRODUCTS

Sanisim bio-decontamination unit

Automated VHP biodecontamination system for fixed installation, designed for connection to isolators via flexible tubing and control cables.

Operated through an integrated touch screen panel, the system uses a hydrogen peroxide solution to ensure effective sterilization.

Suitable for GMP-grade applications requiring validated decontamination cycles.

OTHER PRODUCTS

Hot-Cells for Synthesis

HCM-100 synthesis chamber is designed with complete isolation protection clean air stainless steel inner cavity.
High standards of lead shielding and biological cleanliness are required to ensure the GMP clean pharmaceutical environment in the process of positron radiopharmaceuticals synthesis.

In the upper part of the hot chamber, an independent ventilation system, hot chamber control unit, gas valve, and radiation dose monitor and interlocking unit in the hot chamber are installed.

The large internal design can meet the installation of all synthesizers on the market.

The auxiliary area is located & lower part of the hot chamber, which can provide the auxiliary function requirements of the hot chamber.

OTHER PRODUCTS

Key features:

Active carbon air filtration

Radiation monitoring control in Real-time

Radiation monitoring inter-lock connection

	Lead shielding [mmPb]	Weight [Kg]	GMP air cleanliness	Dimensions [WxDxH]
HCM-100	Front > 100 / other > 85	10000	B	1235x1100x2400

Equipment list of synthesis hot cell

220V power socket

Gas connection panel

HD monitoring system

Laptop operation platform plate

Operation controlling system

Visible touch screen

Pointer meter of negative pressure

Digital radiation dose rate meter

Exhaust filtration system

Nuclide input/output connection

OTHER PRODUCTS

Dispensing Hot-cell

The control area is located in the upper part of the hot chamber, what's more an independent ventilation system, hot chamber control unit, radioactive gas stop valve and radiation dose monitoring and interlocking unit in the hot chamber are installed.
The working area is located in the middle platform of the hot chamber, and the operator enters by opening the side screen door. Wide internal space can contain all size of dispenser installation.

The auxiliary area is located at the lower part of the hot chamber, which can provide the auxiliary function requirements of the hot chamber.

The high standard of lead shielding and biological cleaning safety requirements not only meet the ICRP radiation safety environmental standards, but also ensure the GMP clean pharmaceutical environment in the dispensing process of radiopharmaceuticals for PET.

OTHER PRODUCTS

Key features:

Active carbon air filtration

Radiation monitoring control in Real-time

Radiation monitoring inter-lock connection

UV lamp

Ozone sterilization device

	Lead shielding [mmPb]	GMP air cleanliness	Request Air Volume [m^3/h]	Dimensions [WxDxH]
DCM-100 – MP	Front > 100 / other > 90	A	600	1125x1078x2400
DCM-100	Front > 100 / other > 90	A	600	1157x1073x2400
DCM-75	Front > 75 / other > 70	A	500	1240x1073x2400

Equipment list of synthesis hot cell

220V power socket

Gas connection panel

HD monitoring system

Laptop operation platform plate

Operation controlling system

Visible touch screen

Pointer meter of negative pressure

Digital radiation dose rate meter

Filtration system HEPA (H14) / laminar flow

Nuclide input/output connection

OTHER PRODUCTS

Dispensing unit

DUCM-A dispenser is developed for the actual requirements of dispensing radiopharmaceuticals and automatic capping and dispensing.

The instrument is mainly composed of radionuclide dispensing instrument, automatic capping, automatic dispensing, central control system, etc.

The operator can use the laptop placed outside of shielded isolator.

This method can avoid unnecessary dose exposure to the operators in the process of drug packaging and ensure the accuracy of drug packaging.

OTHER PRODUCTS

Key features:

Packing methods: activity/volume packing

Automatic Half-life decaying correction

Automatic Radioactivity measurement

Automatic dilution volume of WFI

Cover method: Fully automatic

Linearity: ±5%

Packing volume: minimum 0.1 ml

Packing volume: maximum 10 ml

Resolution: 0.1 ml

The total specific activity correction ≤ 1 Ci/ml

Actual packing time: ≤ 60 s

System test: real-time self-detection of the whole system

Equipment communication: activity meter automatic communication (compatible with the CRC series of Capintec company, USA)

Operating platform: Windows English

Database: input, save, query, print data

Information function interface: RS-232, USB, network port

Laptop + label printer are included

OTHER PRODUCTS

Dispensing unit

DUCM-18F automatic radionuclide dispensing instrument is developed and designed for the actual dispensing of radiopharmaceuticals, which meets the cGMP requirements of radioactive isotope drug dispensing.

The instrument is mainly composed of four parts: the radionuclide dispensing instrument (including automatic tungsten removal sleeve assembly), the central control system, the activity meter communication and the printer. It is installed in the shielding protective box, and the operator can use the laptop placed on the outside, input the relevant patient information, and automatically dispense the radionuclide drugs with high dose activity into the syringe, and automatically dilute the normal saline, meet the activity required for each patient.

This method can avoid unnecessary exposure of the operator to the same dose in the process of drug filling, and ensure the accuracy of drug filling.

OTHER PRODUCTS

Key features:

The whole process of F-18 drug packing, dilution, activity measurement was completed in one time

Packing methods: activity/volume packing

Vial/syringe dispensing

Syringe injection protection: 18mmPb

Automatic Half-life decaying correction

Automatic Radioactivity measurement: Automatic dilution volume of WFI

Linearity: ±2%

Packing volume: minimum 0.1 ml

Packing volume: maximum 10 ml

Resolution: 0.1 ml

The total specific activity correction ≤ 1 Ci/ml

Actual packing time: ≤ 60 s

Equipment communication: activity meter automatic communication (compatible with the CRC series of Capintec company, USA)

Operating platform: Windows Chinese

Database: input, save, query, print data

Information function interface: RS-232, USB, network port

Video surveillance

Audio intercom

Laptop

Label printer

OTHER PRODUCTS

Radioactive Waste Gas Device

The radioactive waste gas treatment device made of SS304 and lead plate, is dedicated to radioactive exhaust gas filtration in radiation areas.

The protection standard is 5-20mmPb, the fan size can be customized, and the air volume is 3,000-30,000m^3/h.

OTHER PRODUCTS

Radioactive Environmental Monitoring Probes

The Radioactive environmental monitoring probe is equipped with an energy-compensated GM detector, which can detect X and γ rays, with a measurement range of 0.01uSv/h to 10mSv/h, and an energy range of 50keV to 3MeV.

The probe is further equipped with a built-in alarm and a manually closable audible alarm; and also equipped with an intelligent voice announcement.

OTHER PRODUCTS

Air samplers

ActiveCount SERIES

Portable microbial air samplers designed for cleanrooms and aseptic environments. The units feature stainless steel autoclavable components, HEPA-filtered exhaust, and self-adjusting flow control to ensure accurate, ISO 14698-compliant sampling at 100 L/min or 25 L/min.

SOLAIR SERIES

Portable airborne particle counter for cleanroom monitoring, offering 0.3–10 µm particle detection with a 3.5 CFM (100 LPM) flow rate. Constructed in stainless steel with a 5.7" touchscreen interface and equipped with a long-life laser diode compliant with ISO 21501-4 standards.

Thank you!

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