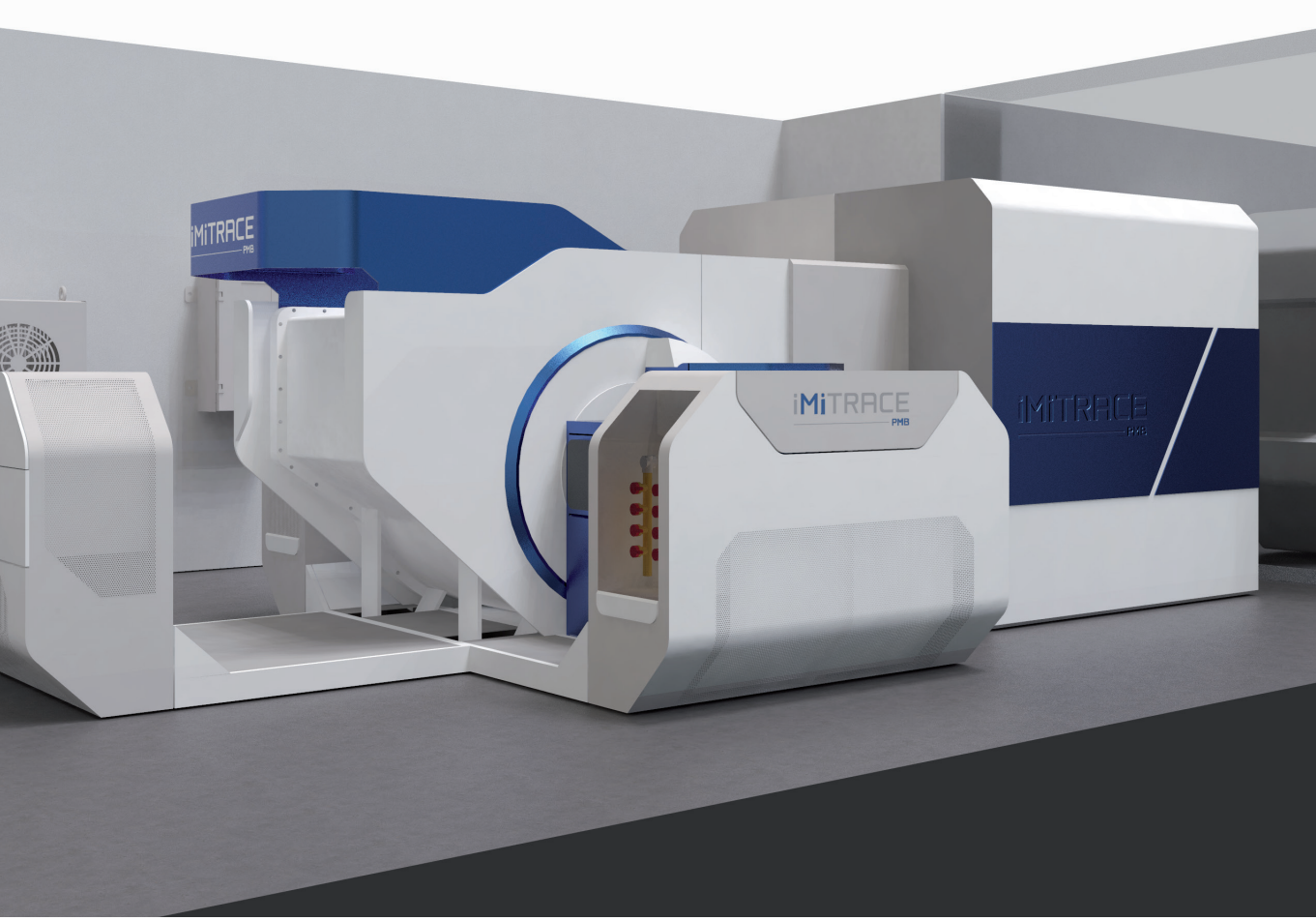
iMiGiNE PMB

personalized molecular imaging

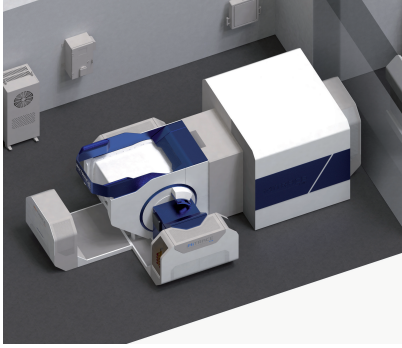
iMiTRACE® Cyclotron

Datasheet

Specifically tailored for the in-situ production of radiopharmaceuticals used in molecular imaging applications, PMB designs and manufactures the cyclotron iMiTRACE®.
Due to its unique architecture, it offers unique characteristics as well as high performance, with a high level of reliability.



iMiTRACE Cyclotron



iMiTRACE is designed for the production of radioisotopes used for molecular imaging applications. It offers unique characteristics due to its architecture.

Versatile

12 MeV is the perfect energy for the on-site production of single-dose ^{11}C, ^{18}F, ^{68}Ga, which are used for personalized molecular imaging.

Moreover, iMiTRACE is able to produce radioisotope batches (over 100 GBq of ^{18}F per run).

Innovative

With its patented self-shielded targetry, iMiTRACE is a lightweight cyclotron. It also is the first cyclotron using a helium-free superconducting and persistent magnet.

As a result, iMiTRACE is compact and extremely stable in operation. The targets do not require helium cooling and provide high production yields.

Easy to install

Due to its lightweight and compact design, iMiTRACE is easily installed within new or existing buildings and requires only 50-cm-thick concrete walls.

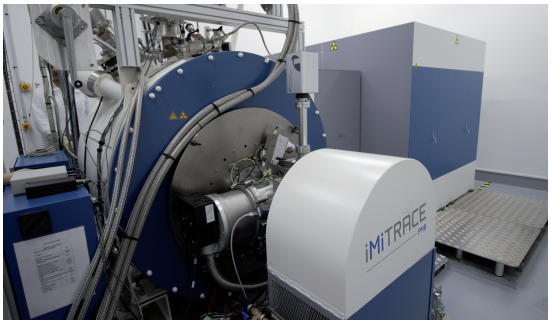
Easy to use

iMiTRACE is designed for fully automated operation, from target selection and filling, to delivery to the radiochemistry.

The intuitive user interface is designed to give all the information required depending on one's expertise and training level.

Easy to maintain

The external ion source and targetries are easily accessible for maintenance operations. These characteristics minimize equipment activation, which reduces the dose for the maintenance staff and increases uptime.



GENERAL INFORMATION

Accelerator type	Cyclotron
Manufacturer	PMB
Accelerator's name	iMiTRACE – He-free

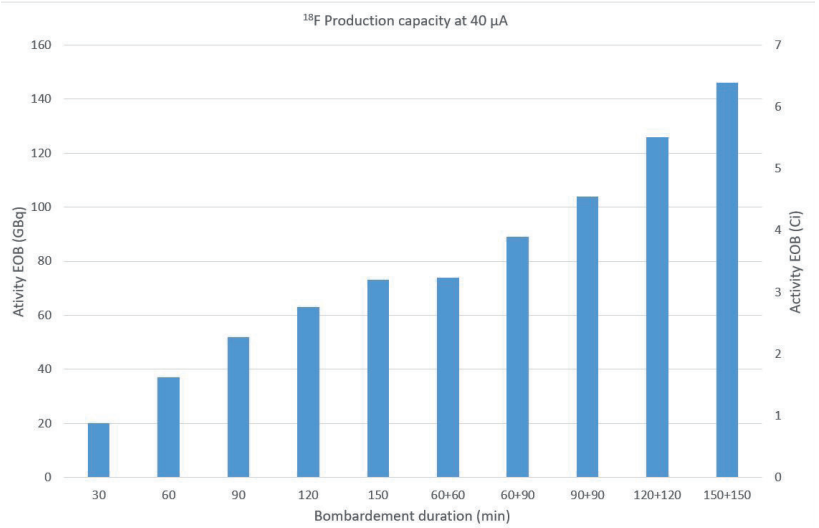
BEAM

Extracted particles	Protons
Accelerated particles	H-
Particles energy	12 MeV
Beam current	0 to 50 µA
Maximum beam power	Up to 600 W

TARGETRY

Number of targetry ports	4
Targetries localization	External, ~1 m away from the cyclotron

Adjustable steering and focusing on the window	Yes
Available targetries	^{18}F, ^{11}C (CO_2 and CH_4) ^{68}Ga under development
^{18}F batch production capacity	> 60 GBq EOB @40 µA after 2h30 bombardement
^{18}F saturation yield > 4,8 GBq/µA	



ION SOURCE

Type	Multi-cusp external ion source

VACUUM

Pump type	1 rotary roughing pump 2 turbomolecular pumps
Operational vacuum	< 5.10^{-7} mbar

MAGNET

Coil type	Nb-Ti superconducting
Superconducting cooling	Sumitomo cryocooler (Gifford Mc-Mahon)
Operating current	100 A
Magnetic field with iron sectors	2.35 T
Number of sectors	3×2

RF SYSTEM

Frequency	108 MHz
RF power	3.5 kW x 3
Dee voltage	33 kV
RF matching	Automatic variable capacitor
Number of amplifiers	3
Amplifier type	Solid-state

SITE REQUIREMENTS

Weight, without shielding	4 500 kg
Weight, including shielding	17 000 kg
Power requirements	65 kW, 240-480 V
Cyclotron volume, without shielding	2,3×3,2×2 m^3
Cyclotron volume, with shielding	3,7×3,8×2 m^3
Cyclotron room surface	31,5 m^2 (4,5 x 7 m)

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PMB designs, manufactures and commercializes high-technology products used in the medical, nuclear power, research, defense & security and industry fields. Our expertise lies in the brazing of complex mechanical assemblies, as well as in the design and manufacture of linear accelerators and cyclotrons.

PMB

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