

# Best<sup>®</sup> Cyclotron Systems



## Best 15

15 MeV  
400  $\mu$ A



## Best 25

20, 25 MeV  
400  $\mu$ A



## Best 28u/35

20, 28  $\longrightarrow$  35–15 MeV  
400  $\longrightarrow$  1000  $\mu$ A



## Best 70

70–35 MeV  
700  $\mu$ A

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healthcare for everyone  
**TeamBest<sup>®</sup>**  
Your True Partner

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AFRICA | ASIA | EUROPE | LATIN AMERICA | MIDDLE EAST | NORTH AMERICA

# The Best Family of PET/SPECT/Research Cyclotrons 15, 25, 28u/35 & 70 MeV

**Best Cyclotron Systems and TeamBest** provide turnkey systems that not only include a cyclotron specific to your isotope requirements but also targets, automated radiochemistry, infrastructure, operations, and maintenance support. As consistent supplies of radioisotopes become more uncertain, particularly for reactor-supplied isotopes, the Best family of cyclotrons provides a Total Solution™ for the medical community that is less dependent on unreliable sources.



**Best 15**



**Best 28u/35**



**Best 25**



**Best 70**

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# Isotope Production Capabilities

Best 15 Isotopes	
PET	
Isotope	Application
Carbon-11	Broad Substitution
Nitrogen-13	Ammonia: blood flow
Oxygen-15	Blood flow, volume, oxygen utilization
Fluorine-18 aqueous	FDG mainly, many others
Fluorine-18 gas	Radiolabeling from gas phase
Copper-64	Integration through chelation chemistry
Iodine-124	Monoclonal antibodies
SPECT	
Isotope	Application
Gallium-67	Fe analog, inflammatory lesions
<b>Technetium-99m</b>	<b>Many</b>
Therapeutic	
Isotope	Application
Palladium-103	Interstitial implants, brachytherapy

Specifications within are subject to change.

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# Isotope Production Capabilities

<b>Best 25/28u/35 Isotopes</b>	
<b>Isotope</b>	<b>Application</b>
Iodine-123	Low dose imaging agent, replacing I <sup>131</sup>
Indium-111	Blood cell labeling
Gallium-68 (generator)	Blood-brain barrier integrity, tumor localization
Thallium-201	Myocardium functional assessment
Krypton-81m (generator)	Gas for ventilation imaging or in solution for perfusion imaging
Plus all the isotopes the Best 15 can produce	

<b>Best 70 Isotopes</b>	
<b>Isotope</b>	<b>Application</b>
Rubidium-82 (generator)	Diagnosis of coronary artery disease, coronary stenosis, myocardial infarction imaging, viability, collateral function and cardiomyopathy
Iodine-123	Low dose imaging agent, replacing I <sup>131</sup>
Copper-67	Used in radiotherapy by accumulation in tumour tissue using monoclonal antibodies
Krypton-81m (generator)	Used either in gaseous form for ventilation imaging or in solution for perfusion imaging
Research: Physics, chemistry, Radioactive Ion Beam, activation energy, etc.	

Specifications within are subject to change.

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# Isotope Production Capabilities

Summary		
Cyclotron	Energy (MeV)	Isotopes Produced
Best 15	15	F <sup>18</sup> , Tc <sup>99m</sup> , C <sup>11</sup> , N <sup>13</sup> , O <sup>15</sup> , Cu <sup>64</sup> , Ga <sup>67</sup> , I <sup>124</sup> , Pd <sup>103</sup>
Best 25	20, 25	Best 15 + I <sup>123</sup> , In <sup>111</sup> , Ge <sup>68</sup> /Ga <sup>68</sup>
Best 28 Upgradeable	20, 28	Best 15 + I <sup>123</sup> , In <sup>111</sup> , Ge <sup>68</sup> /Ga <sup>68</sup>
Best 35	35–15	Greater production of Best 15, 25 isotopes plus Tl <sup>201</sup> , Rb <sup>81</sup> /Kr <sup>81</sup>
Best 70	70–35	Sr <sup>82</sup> /Rb <sup>82</sup> , I <sup>123</sup> , Cu <sup>67</sup> , Kr <sup>81</sup> + research

Radioisotope, radiochemical, and radiopharmaceutical production requires targets, chemistry, QC, documentation, and packaging for the radioproducts to be shipped and used. Teambest has developed this array of radiopharmacy support so that routine steps and protocols may be obtained from TeamBest and its broad base of service and allows rapid deployment of radiochemicals and radiopharmaceuticals after facility commissioning. The cyclotrons and production processes are tailored to each application.

*Specifications within are subject to change.*

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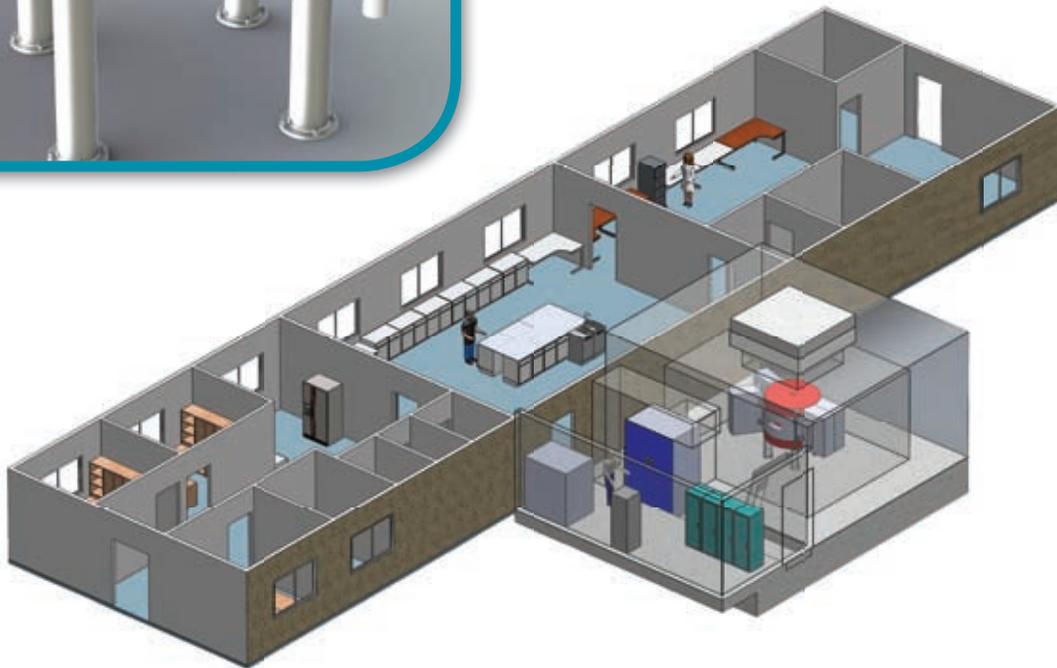
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# Best 15 MeV Cyclotron



**Best 15**



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# Ideal for FDG & Tc-99m Supply

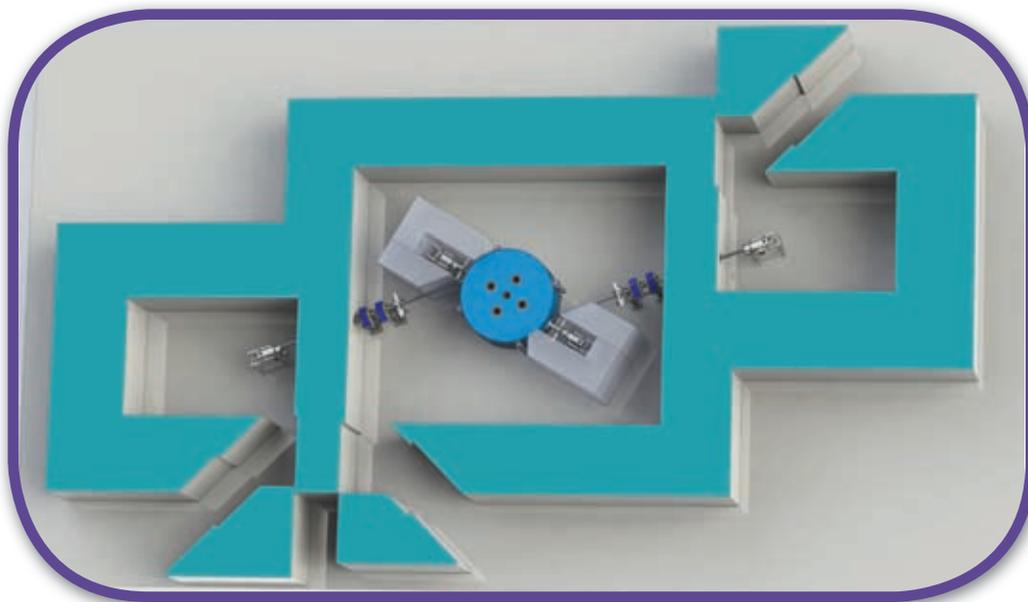
## Best 15

- 15 MeV fixed energy H<sup>-</sup> cyclotron
- External ion source
- 400 μA extracted proton beams
- 2 simultaneous extracted beams
- 4 target positions

The B15 is designed for a small pharmacy that is dedicated to the creation of Positron Emitters (PET). Though the principal radioisotope, F<sup>18</sup>, is amply produced by the B15, the proton bombarding energy is adequate for the production of the other positron emitters in large amounts. In particular, C<sup>11</sup> and N<sup>13</sup> are available in large quantities and high specific activity. The high beam current of the B15 also permits low contaminant Tc<sup>99m</sup> in quantities that will serve a large urban population from a centralized radiopharmacy. The 15 MeV energy of the B15 also allows smaller amounts of target material with the corresponding production cost economy.

# Best 25 MeV Cyclotron

**Best 25**



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# For a Broader Range of Isotopes

## Best 25

- 25 and 20 MeV fixed energy H<sup>-</sup> cyclotron
- 400 μA extracted proton beams
- 2 simultaneous extracted beams
- 4 target positions

The B25 is an entry level cyclotron that produces the full collection of PET isotopes but in addition delivers small quantities of some single photon emitters (SPECT). It was designed for groups that are focused on delivering clinical trial quantities of radiopharmaceuticals from a central location (e.g. I<sup>123</sup> labeled drugs), while still providing the standard PET drugs. The small footprint and limited beam current provides an opportunity for specific radiopharmaceutical production.

# Best 28u/35 MeV Cyclotron

## Best 28u/35



The B28 provides complete access to the PET isotopes and offers access to a broad range of single photon emitters (SPECT). When large quantities of SPECT radioisotopes are required then the cyclotron energies of the B28 are matched to the nuclear physics yields and the processing requirements. The B28 supports regional supply of both PET and SPECT radiopharmaceuticals. There is an upgrade path to a high current B35 that provides capability for National and International demands. Both the larger nuclear physics cross sections at higher energies for some radioisotopes as well as the higher current provides a single source for specific radiopharmaceuticals and an international demand.

# The World's ONLY Upgradeable Cyclotron

## Best 28u

- 28 and 20 MeV fixed energy H<sup>-</sup> cyclotron
- 400 μA extracted proton beams
- 2 simultaneous extracted beams
- 4 target positions
- Fully upgradeable to Best 35

## Best 35

- 35–15 MeV variable energy H<sup>-</sup> cyclotron
- 1000 μA extracted proton beams
- 2 simultaneous extracted beams
- Up to 6 independent beam lines and target positions

# Best 70 MeV Cyclotron

## Best 70



## Best 70

- 70–35 MeV variable energy  $H^-$  cyclotron
- 700  $\mu A$  extracted proton beams
- 2 simultaneous extracted beams
- Multiple independent beam lines and target positions

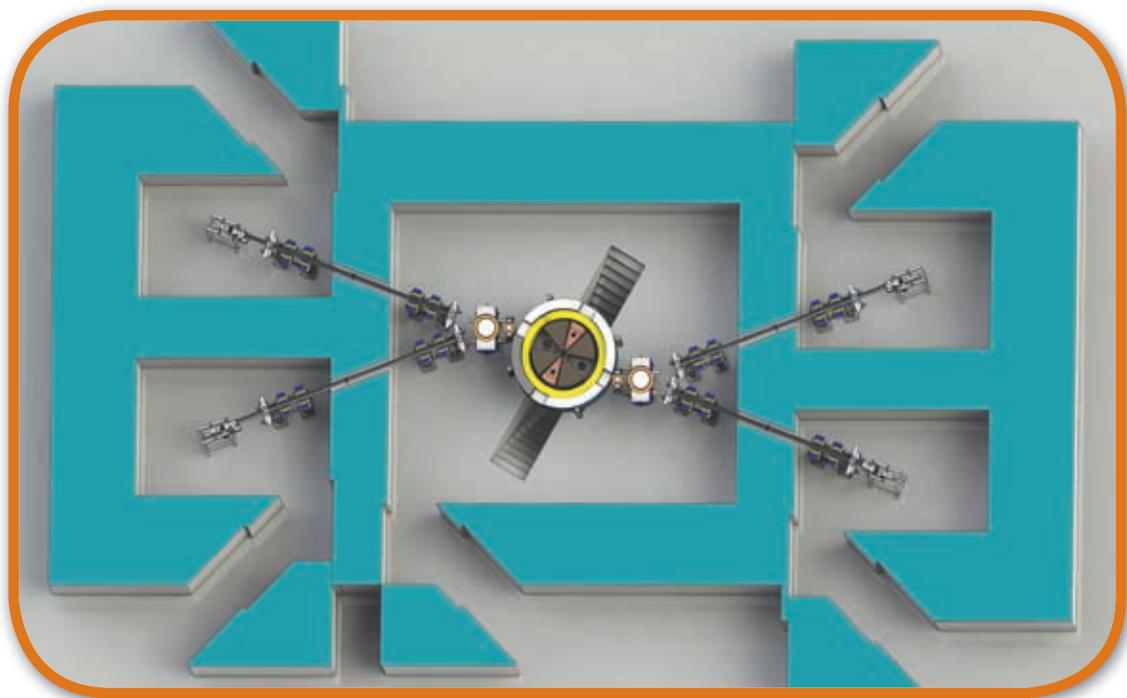
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# Ideal for Sr-82/Rb-82 Supply & Research

The B70 cyclotron provides a platform for both radioisotope generator parents (e.g. Sr<sup>82</sup>) and therapy radioisotopes (Cu<sup>67</sup>). The variable energy between 35 and 70 MeV provides access to single photon emitters as well. Both generator parents and therapy radioisotopes have long half-lives, which result in lower yields per microamperes. Longer dedicated production runs are required but that is balanced by the large International distribution opportunity. The B70 is designed for high current production and the targetry supplied with the cyclotron is matched to the international requirements.



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