



Presentation of TargIT F18 liquid targets , RO4SS (4 ml, self shielded NB insert) and RO6SS (6 ml, self shielded NB insert) , water cooled only , IBA 18/9 and GE Petrace cyclotrons compatible

The new F18 RO4SS target was developed in order to produce maximum quantity of F18 using the most irradiating current produced by either 80 uA low current IBA cyclotrons (single beam use) or 150 uA high current machines (dual beam). The maximum current to use with this target is up to 80 uAh in order to achieve a good pressure and filling volume

The target has a niobium insert with a 4,0 ml total volume and permits a variation of filling volume from 2,5 to 3 ml based on customer's needs.

The new F18 RO6SS target was developed in order to produce maximum quantity of F18 using the most irradiating current produced by either IBA or GE 150 uA high current machines in single beam. The maximum current to use with this target is up to 130 uAh in order to achieve a good pressure and filling volume.

The target has a niobium insert with a 6,0 ml total volume and permits a variation of filling volume from 3 to 4,5 ml based on customer's needs.

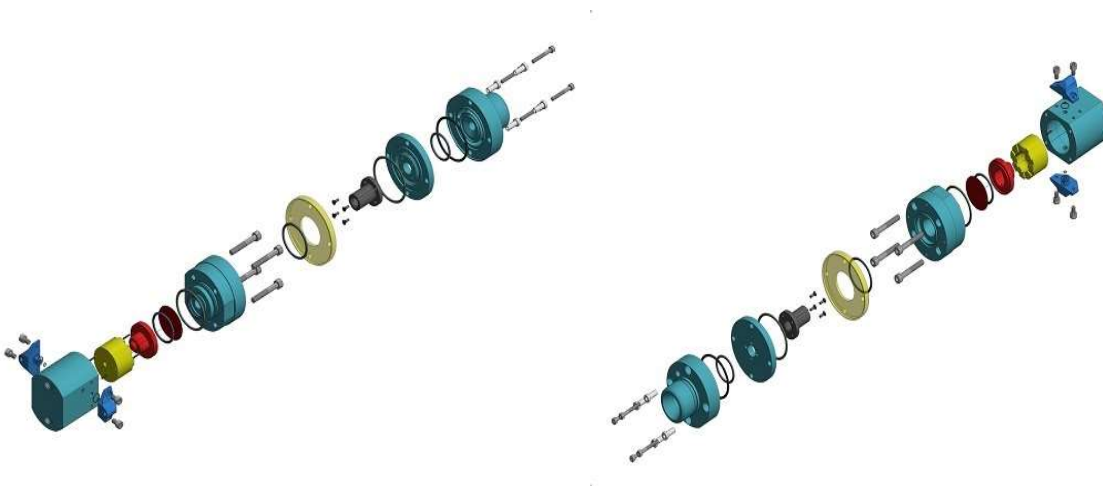
The increased water cooling capacity helps to deliver a good quality fluorine and predictable EOB activity, with low variation of target yield even during unstable beam.

The target is using only water cooling so is not necessary to use Helium cooling anymore . The He cooling line can be easily by-passed so no other action is necessary in order to install and safely use the target.

The target insert it is self-shielded by a tungsten cover in order to decrease the radio exposure of the maintenance technician during handling and maintenance operations.

For IBA cyclotron the target comes with a new graphite collimator of 10 cm , and a window holder fully compatible with IBA target valves.

The height regulator is included as well and permits to control the position of the target in order to obtain the best irradiation curve.



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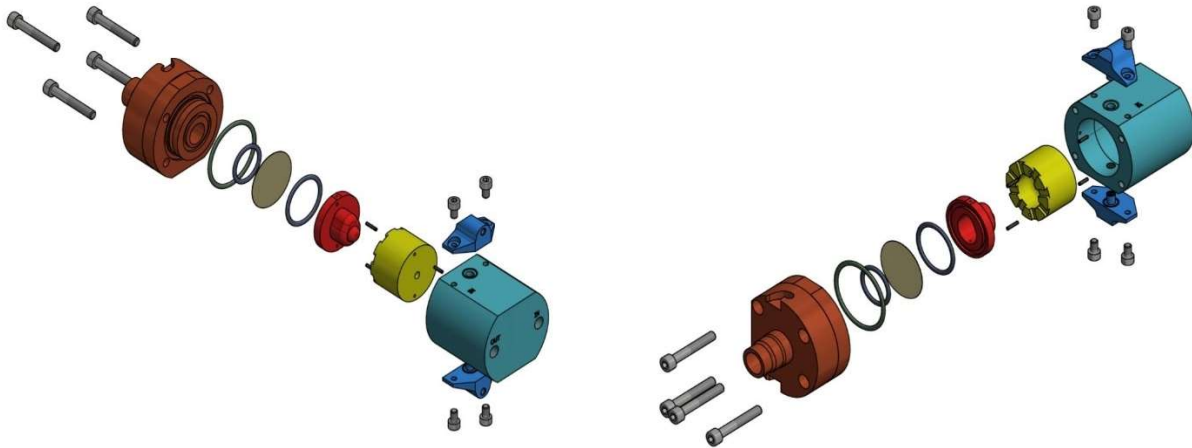
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For GE cyclotron the target has the compatible target support installed in order to fit exactly with the cyclotron exit valve.



Because of the 35 μm target window foil and increased cooling capacity and the fact that the Havar window is directly in contact with the niobium insert without any contact with any type of o-ring the target can be used easily for more than 10000 μAh without being necessary to perform the replacement of the Havar foil. As well the Nb insert is not releasing any solid particles so there is no risk of Fluorine contamination.

Based on Target Saturation Yield calculation formula we consider a value of 210-240 saturation yield (to consider the exit port were the target will be installed, current intensity and loading volume)

Installation and the acceptance test has to be performed by an expert cyclotron engineer.

In order to explain better the performance of target and the modality of use we can use the following example:

F18 (GBq) (single target)	F18 (GBq) (totale)	Start of Bombardment	End of Bombardment	Run Time (min)	Average Beam (μA)	Integrated Current ($\mu\text{A/h}$)	Saturation Yield
300,00	300,00	01:00	03:30	150	60,00	150,0	221
326,00	326,00	01:00	03:30	150	65,00	162,5	221
350,00	350,00	01:00	03:30	150	70,00	175,0	221

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F18 (GBq) (single target)	F18 (GBq) (totale)	Start of Bombardment	End of Bombardment	Run Time (min)	Average Beam (uA)	Integred Current (uA/h)	Saturation Yield
500,00	500,00	01:00	03:30	150	100,00	250,0	221
550,00	550,00	01:00	03:30	150	110,00	275,0	221
600,00	600,00	01:00	03:30	150	120,00	300,0	221

The targets are fully compatible with IBA and GE cyclotrons and no modification is necessary to be done before installation.

The patent is under registration at OSIM Romania no.09069/18.12.2019 – TargIT 4ss/6ss

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