

## IMF™ and GMF™ Setup Conditions and Tolerances

### Introduction

The **Isocentric Mounting Fixture** (IMF) is an optional accessory for Daily QA 3™, MapCHECK 2™, MapCHECK, and PROFILER 2™ (see “Isocentric Mounting Fixture” below).

The **Gantry Mounting Fixture** (GMF) is an optional accessory for IC PROFILER™ (see “Gantry Mounting Fixture” on page 3).

This document summarizes the Sun Nuclear Corporation dosimetric equipment supported for use with the IMF and GMF, provides associated set up conditions and tolerances, and suggested solutions for misalignment sources that may occur between the IMF and instruments (see “IMF – Potential Misalignment Sources and Suggested Solutions” on page 2).

### Isocentric Mounting Fixture

Table 1. IMF Assemblies

Accelerator	P/N	Color	Weight	Dimensions
Varian	1177000-V	Blue	7.4 kg (6.25 lbs)	39.4 x 31.5 x 39.1 cm (5.5 x 12.4 x 15.4")
Siemens	1177000-S	Red	8.1 kg (17.75 lbs)	39.4 x 31.5 x 48.0 cm (15.5 x 12.4 x 18.9")
Elekta	1177000-E	Green	7.0 kg (17.5 lbs)	39.4 x 28.7 x 48.8 cm (15.5 x 11.3 x 19.2")

Table 2. IMF, Part Number 1177000-V,-S,-E

Item	DQA3	PROFILER 2	MapCHECK	MapCHECK 2
SSD	98.9 cm	99 cm	98.63 cm	98.91 cm
SDD	100 cm	100 cm	99.98 cm	100.07 cm
SDD Tolerance	± 0.5 mm	± 0.5 mm	± 0.5 mm	± 0.5 mm
X, Y Position and Tolerance	CAX ± 0.5 mm	CAX ± 0.5 mm	CAX ± 0.5 mm	CAX ± 0.5 mm
Mounting Direction (IMF-S) *	Perpendicular to couch			
Mounting Direction (IMF-V, -E) *	Parallel to couch			
Maximum Supported Weight (Gantry IEC angles: 0–360°)	12.35 kg (27.2 lbs)			
Maximum Buildup (0–360°)	5 cm			
* In machine collimator 0° position.				

## IMF Setup Summary



**Note:** Detailed instructions for attaching the IMF to the gantry, securing the instrument to the IMF, and installing buildup are in the reference guide and online help file for each instrument.

- 1 Attach the IMF to the gantry.
- 2 Insert the instrument in the IMF and secure to the bottom plate of the IMF. When properly installed, the center detector will be aligned with the beam axis.
- 3 If desired, install buildup (see Table 2 for maximum buildup amount).

## IMF – Potential Misalignment Sources and Suggested Solutions

### Potential Misalignment Sources

- The nominal tolerance between the devices (Daily QA 3, MapCHECK, and PROFILER 2) and IMF centers is  $\pm 0.5$  mm on X, Y and Z directions. When mounted in the IMF, the SDD for the Daily QA 3, MapCHECK and PROFILER 2 should be 100 cm. For MapCHECK 2, the SDD is 100.07 cm.
- The IMF is designed according to the nominal dimensions of the accelerator mounting mechanism. Therefore, the tolerance of the mounting mechanism and the play in the accessory tray could cause an offset between the IMF and the linac cross hair.
- The cross hair or laser offset from the actual beam center may appear to be the offset between the IMF and cross hair.

### Suggested Solutions

- A 1.5 mm error on SAD (100 cm) will only cause a 0.3% error. This error can be corrected in the TPS calculation, or, to correct the error in the hardware, use spacers to raise the device on the IMF.
- The offset of 1 mm on X and Y directions should not normally impose a significant error in the measurement. If a 1 mm offset is not acceptable, or if the error is larger:
  - Check the alignment error between the cross hair and true beam center.
  - Adjust the accessory tray or replace worn parts to improve the alignment between the IMF and cross hair, if possible. This would be the likely solution for the IMF shift when gantry is rotated.
- The offset error on X and Y directions may be corrected by software using TPS calculation or using the Calc Shift feature in the MapCHECK software.
- The offset error on Z direction for MapCHECK 2 may be corrected in the TPS software.

If these suggestions do not resolve the issue, contact Sun Nuclear Customer Support:

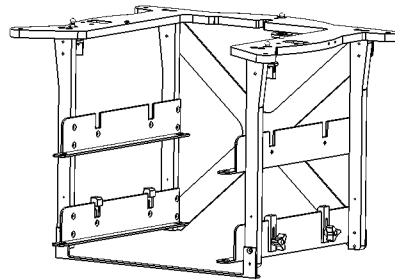
Telephone: +1 321-259-6862, option 3

Fax: +1 321-259-7979

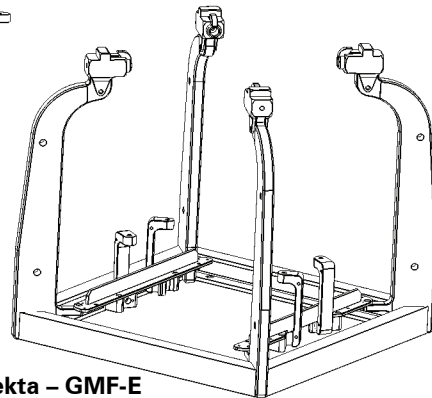
E-mail: [contactus@sunnuclear.com](mailto:contactus@sunnuclear.com) or [techsupport@sunnuclear.com](mailto:techsupport@sunnuclear.com)

## Gantry Mounting Fixture

Currently, the Gantry Mounting Fixture is only used with the IC PROFILER. GMF assemblies are available for two accelerator types: Elekta and Varian.



**Varian – GMF-V**  
P/N 1122000-V



**Elekta – GMF-E**  
P/N 1122000-E

Table 3. GMF Assemblies

Accelerator	P/N	Color	Weight	Dimensions
Varian	1122000-V	Black, blue rails	3.7 kg (8.2 lbs)	40.0 x 47.1 x 42.2 cm (15.7 x 18.6 x 16.6")
Elekta	1122000-E	Black	16.8 kg (37 lbs)	56.5 cm x 56.5 cm x 56.0 cm (22.25" x 22.25" x 22.0")

Table 4. GMF-V, Part Number 1122000-V

Item	IC PROFILER
SSD	Lower rails: 99.1 cm Upper rails: 74.1 cm
SDD	Lower rails: 100 cm Upper rails: 75 cm
SDD Tolerance	± 0.5 mm
X, Y Position Tolerance	± 0.5 mm
Electron Cone	Yes
Double Electron Wedge	Yes
Maximum Supported Weight (0–360°)	27.68 kg (50 lbs)
Maximum Buildup (0–360°)	1.5 cm

Table 5. GMF-E, Part Number 1122000-E (IC PROFILER)

Item	IC PROFILER
SSD	99.1 cm
SDD	100 cm
SDD Tolerance	± 0.5 mm
X, Y Position Tolerance	± 0.5 mm
Electron Cone	Yes
Double Electron Wedge	Yes
Maximum Supported Weight (0–360°)	27.68 kg (50 lbs)
Maximum Buildup (0–360°)	3 cm

## GMF Setup Summary



**Note:** Detailed instructions for attaching the GMF to the gantry, securing the instrument to the IMF, installing an electron applicator, and installing buildup are in Bulletin 17-09 (GMF-E) and Bulletin 1-10 (GMF-V), Part Number 1122093. The applicable bulletin is included with the GMF unit when it is shipped.

- 1 Attach the GMF to the gantry.
- 2 Insert the IC PROFILER in the GMF and secure to the bottom rail of the GMF. When properly installed, the center chamber will be aligned with the beam axis.
- 3 If required, install an electron cone (GMF-V only), double wedge plate, or buildup (refer to Table 5 for maximum buildup amount).