Template Provided By:

Cancer Imaging Program

National Cancer Institute

Standard Operating Procedure

GEN-Q110

Filter Integrity Test by Bubble Point

1. **Purpose:** To describe the procedure for integrity testing a sterile filter using bubble-point determination.

2. **Scope:** The last step in the manufacturing process requires sterile filtration of the final product. Integrity testing of the sterile filter post-filtration adds another level of assurance that the product is sterile. This procedure will be performed at the sites manufacturing radiopharmaceuticals. This procedure is one of the tests performed after the manufacturing is complete, and it must be completed prior to releasing the lot for human administration.

3. **Responsibilities:**
   3.1. *Manufacturing Sites*: To follow this procedure as written and to ensure that all results, control information, and raw data are documented as specified in the corresponding Master Production & Batch Records for this lot.

4. **References**
   USP 28 ‹821› Radioactivity
   USP 28 ‹823› Radiopharmaceuticals For Positron Emission Tomography—Compounding
   GEN-Q015, "Investigating Out of Specification QC Test Results"
   FDA Draft Guidance PET Drug Products—Current Good Manufacturing Practice (CGMP)—September 2005 (CDER)
   MPR-[Name], Master Production Record of the final product
   Manufacturer's Specifications for Integrity Test

SOP**: GEN-Q110** Date:_____

Printed Name	Signature	Date
Author:		
Regulatory Approval:		

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GEN-Q108, "Resterilization of Final Product in the Event of a Failed Filter Integrity Test"
GEN-M120, "Documentation of Manufacturing Variances**"**

5. **Forms**
   - **MBR-[Name]**, Master Batch Record for the final product
   - **Form MVR-001**, Manufacturing Variance Report Form
   - **Form IOS-001**, Investigating Out of Specification (OOS) QC Test Results Form

6. **Policies**

   Perform the procedures using good radiation safety techniques, as the filter will contain residual radioactive product.

7. **Materials and Equipment**

   Nitrogen Gas, Compressed Air, or Air in a Syringe
   Pressure Test Apparatus
   Beaker
   Water
   Filter to be Integrity Tested (still wet from use)

8. **PROCEDURES**

   Integrity Test of the Filter

   Attach the filter to the male Luer fitting of the pressure test apparatus. Immerse the filter outlet, with the needle attached, in a beaker of water.
   Slowly increase the applied pressure while observing the water for any emerging bubbles from the filter outlet.

NOTE: Initially a few bubbles may appear, however, they should cease as the pressure is increased.

Continue increasing the pressure on the filter until a slow stream of bubbles begins to emerge from the filter outlet, **OR** until the pressure exceeds 55 psig. Record the pressure at which bubbles appeared, or "≥ 55 psig" if pressure exceeded 55 psig without development of bubbles, as the filter bubble point.
Compare the wet filter bubble point to the manufacturer's specification (≥ 50 psig for a Millipore SLGS.)
If the test yields a bubble point lower than the wet filter bubble point specification, pass approximately 10-30 mL of water through the filter to insure that it is completely wet and repeat the test. The filter must be completely wet to perform an accurate integrity test.

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NOTE: If re-wetting is necessary, document on **Form MVR-001**, "Manufacturing Variance Report Form."

Acceptance Criteria

The measured wet filter or re-wetted filter bubble point *must be equal to or greater than* the manufacturer's specification.

If the filter fails the bubble point test and the product is refiltered using a new filter, the *new filter must pass the bubble point test* and *its bubble point must be equal to or greater than* the manufacturer's specification.

Failure to Pass the Bubble Point Test

If the *original filter has a bubble point less than* the manufacturer's specifications, and *it also fails the bubble point test after rewetting*, perform Resterilization of the Final Product as per **GEN-Q108**, "Resterilization of Final Product in the Event of a Failed Filter Integrity Test," and document the integrity test failure and manufacturing variance on **Form MVR-001**, "Manufacturing Variance Report Form," and place with the corresponding batch record.

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