

DESCRIPTION

P1010 - Standard size sample compartment gamma calibration phantom, for use with packages of routine dosimeters, up to two alanine transfer dosimeters, and liquid dosimeters such as Ceric, Cerous, and Dichromate.

P1011 - Small size gamma calibration phantom, for use with small packages of routine dosimeters and up to two alanine transfer dosimeters.

APPLICATION(S)

Gamma calibration phantoms are used for performing in-situ batch calibration of dosimeters in gamma irradiation facilities. These phantoms have been designed and built to provide a consistent method of presenting dosimeters to a radiation source as detailed in ISO/ASTM 51261. Also reference NPL Report CIRM 29 - Guidelines for the Calibration of Dosimeters for Use in Radiation Processing.

SPECIFICATIONS

Physical Specifications:

| | |
|-----------------------|---|
| Material: | Polystyrene |
| Unit Dimensions: | <p>P1010: External - 18cm x 11cm x 3cm; 5 sections, each 6mm \pm 0.5mm thick; 2 sections have 26mm \pm 0.5mm diameter holes for alanine holders and a 70mm \pm 1.0mm square opening for dosimeter packages, 1 section has a 70mm x 140mm \pm 1.0mm opening for large dosimeter packages or ampoules; 4 bolts and nuts secure the sections together.</p> <p>P1011: External - 11cm x 11cm x 3cm; 5 sections, each 6mm \pm 0.5mm thick; 2 sections have 26mm \pm 0.5mm diameter holes for alanine holders, 1 section has a 70mm square opening for dosimeter packages; 4 bolts and nuts secure the sections together.</p> |
| Color: | White or Black |
| Printing: | None |
| Packaging: | Cardboard flip-box |
| Packaging Dimensions: | 9 in x 5.5 in x 1.5 in |
| Packaged Weight: | 1.3 lbs. (P1010); 1.0 lbs. (P1011) |

Shelf Life:

No expiration.

Storage:

Store out of direct exposure to sunlight.

USAGE

GEX Corporation recommends the utilization of NPL CIRM Report 29 as a guiding document on performing a calibration (See References section below.)

Usage Instructions:

1. Remove the nuts on the calibration phantom bolts and lift off the top two polystyrene plates.
2. Record the calibration dosimeter numbers, the transfer dosimeter number, and the target dose in the GEX Calibration Data Workbook or equivalent.
3. Place alanine transfer dosimeter into the circular well. See Figure 1 below.



FIGURE 1 (small phantom)

4. Place the packaged routine dosimeters into the square well on top of the alanine transfer dosimeter or in the separate square well. Secure all dosimeters in place so that they do not shift during irradiation. Stack pouches of film dosimeters to achieve highly uniform results. See Figure 2.



FIGURE 2 (standard phantom)

(Alternative method for P1010 standard dosimeters such as ceric-cerous or dichromate ampoules or PMMA: Place the dosimeter ampoules into the square well and the alanine transfer dosimeter into the circular well. Secure all dosimeters in place so that they do not shift during irradiation. See Figure 3 below.)



FIGURE 3 (alternative method, standard phantom)

(Alternative method for P1010 and a mixture of dosimeter types: Place ampoules into the square well, the alanine transfer dosimeter into the circular well and the radiochromic dosimeter package on top of the alanine dosimeter. **Do not** overload the phantom; this could cause shadowing and dosimeter results could be inconsistent. Secure all dosimeters in place so that they do not shift during irradiation.)

- Place a temperature monitoring device (such as the GEX P/N: P8003) in the calibration phantom and secure it in place so that it does not shift during irradiation.

NOTE: The adhesive on the P8003 Irreversible Temperature Label is permanent. Do not stick them to the alanine transfer dosimeter cases or the phantoms.

- Replace the fourth and fifth plates and reassemble the phantom screwing on the bolts. See Figures 4 and 5.

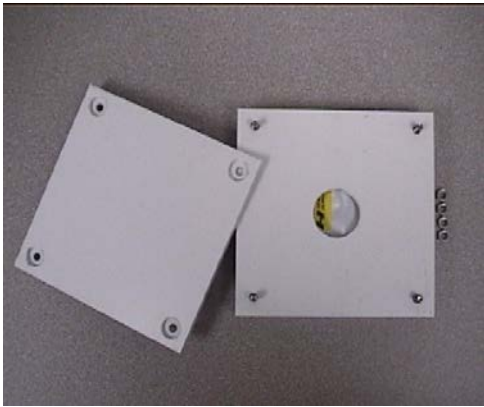


FIGURE 4



FIGURE 5

- The calibration dosimeters and the transfer dosimeter should be parallel to the source rack while in the irradiator in order to achieve the highest dose uniformity. See Figure 6.

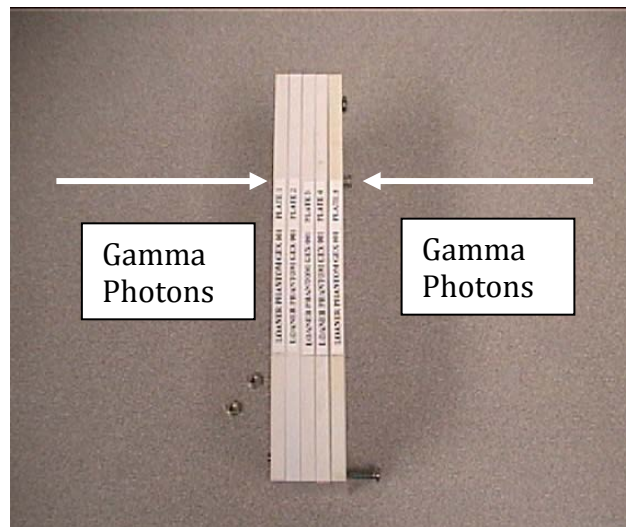


FIGURE 6

- Record the process geometry of the calibration phantom in the Calibration Data Workbook. Describe and state the density of any surrounding material, such as foam, simulated product, and actual product and its geometry, etc.

PRODUCT PHOTOS



Standard Gamma Phantom



Small Gamma Phantom

ACCESSORIES

| GEX Part No. | Description | Purpose | Link |
|--------------|--------------------------------|---|---|
| P8003 | Irreversible Temperature Label | Place a temperature monitoring device (such as the GEX item #P8003) in the calibration phantom and secure it in place so that it does not shift during irradiation. | http://gexccorporation.com/pdf/100-109_A%20Irreversible%20Temperature%20Indictors_021015.pdf |
| B3000 | B3 WINDose Dosimeters | Routine B3 dosimeters | http://gexccorporation.com/pdf/100-101%20B3%203000_PI_112912.pdf |

HEALTH/ENVIRONMENTAL INFORMATION

Can be safely discarded in general waste receptacles.

GUARANTEE

Guarantee:

1 year GEX satisfaction guarantee. May be returned with or without reason with one year from the date of delivery.

REFERENCES

References:

- ISO/ASTM 51261 - Standard Guide for Selection and Calibration of Dosimetry Systems for Radiation Processing.
- NPL Report CIRM 29 - Guidelines for the Calibration of Dosimeters for Use in Radiation Processing.

GEX TECHNICAL REPORTS: <http://www.gexc.com/library-documents.php>

- 100-201 Post Irradiation Heat Treatment of B3 Dosimeters
- 100-203 Comparison of ASTM Calibration Method and Dose On Response Method
- 100-208 Calibration Analysis

To learn more about GEX products and services, visit www.gexc.com or contact a GEX representative at +1 303 400-9640.