



# P1010 & P1011 Gamma Calibration Phantoms

## Technical and Usage Information

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.

### Description:

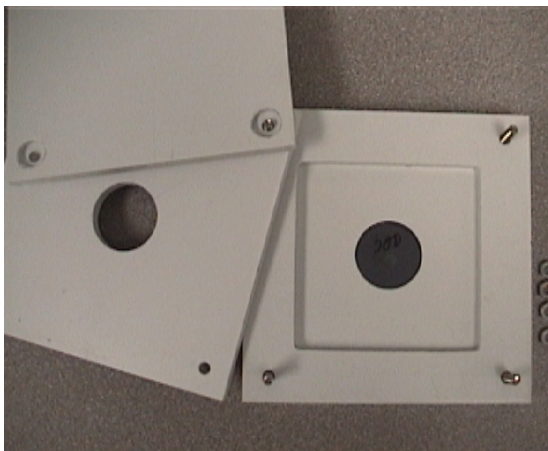
- P1010 - A Large sample compartment gamma calibration phantom, for use with packages of routine dosimeters, up to 2 alanine transfer dosimeters, and liquid dosimeters such as Ceric Cerous and Dichromate.
- P1011 - A Standard gamma calibration phantom, for use with small packages of routine dosimeters and up to 2 alanine transfer dosimeters.

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



### Usage:

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.
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.

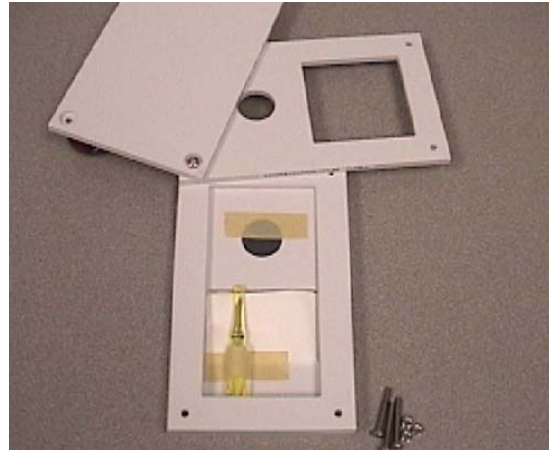




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(Alternative method for P1010 large dosimeters such as ceric-cerous or dichromate ampoules or PMMA: Place the dosimeter ampoules into the square well and the alanine transfer dosimeter into the circular well. Secure all dosimeters in place so that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

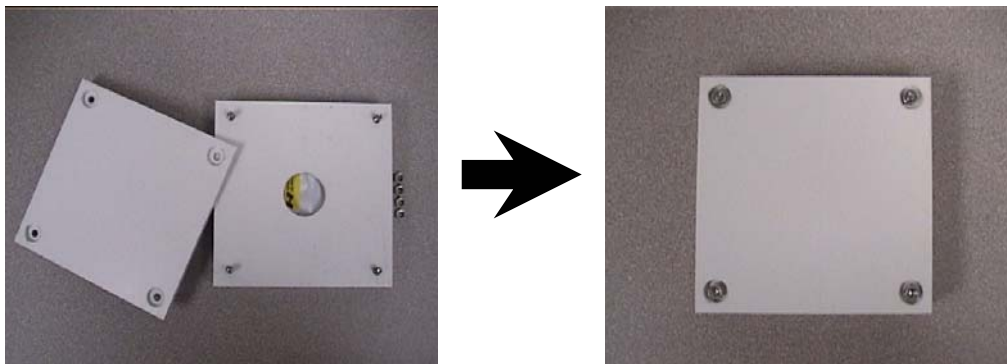


(Alternative method for P1010 and a mixture of dosimeter types: Place ampoules into the square well, the alanine transfer dosimeter into the circular well and the radiochromic dosimeter package on top of the alanine dosimeter. Do not overload the phantom; this could cause shadowing and dosimeter results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

5. 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.

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

6. Replace the forth and fifth plates and reassemble the phantom screwing on the bolts.

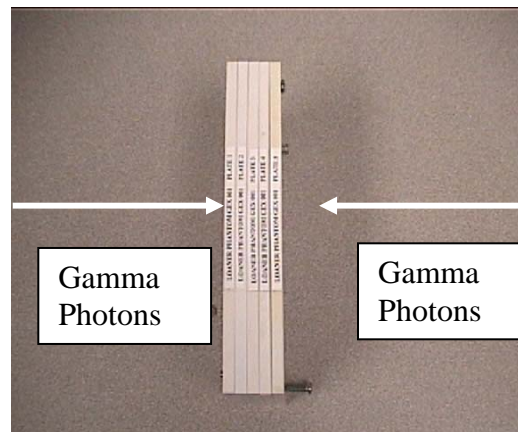


7. The calibration dosimeters and the transfer dosimeter should be parallel to the source rack while in the irradiator in order to achieve the highest dose uniformity.



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8. 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, actual product and its geometry, etc.

### 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.