P1010 & P1011 伽玛校准模体

技术和使用信息

伽玛校准模体用于执行伽玛工厂剂量计in-situ原位批校准。这些模体被设计并制作以提供将剂量计呈现于辐射源的一个一致的方法，正如ISO/ASTM 51261所详述。

描述:

P1010 – 一个大样品隔间的伽玛校准模体，可用于常规剂量计包，多达2个丙氨酸剂量计，以及譬如Ceric Cerous和重铬酸盐这样的液体剂量计。
P1011 – 一个标准的伽玛校准模体，用于小包装的常规剂量计和多达2个丙氨酸传递剂量计。
GEX公司推荐使用NPL CIRM Report 29作为执行校准工作的指引文件（见参考文件）。

使用：

1. 拆除校准模体螺栓上的螺，并提起上部的2片聚苯乙烯板。
2. 在GEX校准数据工作本上或等效物上记录校准剂量计编号，传递剂量计编号以及目标计量。
3. 将丙氨酸传递剂量计放入圆形的井里。
4. 将包装好的常规剂量计放入丙氨酸传递剂量计顶部的方井内。确保所有的剂量计都处于合适的位置以至于在辐照过程中不会移动。叠放薄膜剂量计小袋以获得高度一致的结果。

标准伽玛模体　大伽玛模体

(P1010的可选方法，对于诸如ceric-cerous、重铬酸盐安瓶或PMMA（聚甲基丙烯酸甲酯）的大剂量计：将剂量计安瓶放置在方井内并把丙氨酸传递剂量计放置在圆井里。确保剂量计在其位置上不至于在辐照过程中产生移动。)
（P1010的可选方法，多种类型的剂量计混合放置：将安瓶放置在方井里，丙氨酸传递剂量计放置在圆井里，辐照变色薄膜剂量计包放置在丙氨酸剂量计的上面。不要在模体里过多装载，这可能会导致遮蔽以及剂量计最后结果的不一致。确保剂量计在其位置上不至于在辐照过程中产生移动。)
5. 放置温度检测装置 （譬如GEX的#P8003）在校准模体里并确保其在原位不至于在辐照过程中产生移动。
注意:：P8003不可逆温度标签上的粘合剂是耐久的。不要把他们粘贴到丙氨酸传递剂量计盒子或模体（Phantom）上。
6. 放置第四、第五片聚苯乙烯板并重新安装模体拧紧螺栓。
7. 校准剂量计和传递剂量计在辐照时应该和源架平行，以便获得最高的剂量均匀度。
8. 记录校验模体的加工几何形状在校准数据工作表中，描述并陈述周围任何材料（譬如泡沫、模拟产品、实际产品）的密度以及它的几何形状等。

参考资料:

ISO/ASTM 51261：辐照加工用剂量系统选择与校准标准指引。

NPL Report CIRM 29：辐照加工用剂量计校准指引

P1010 & P1011 伽玛校准模体

技术和使用信息

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.

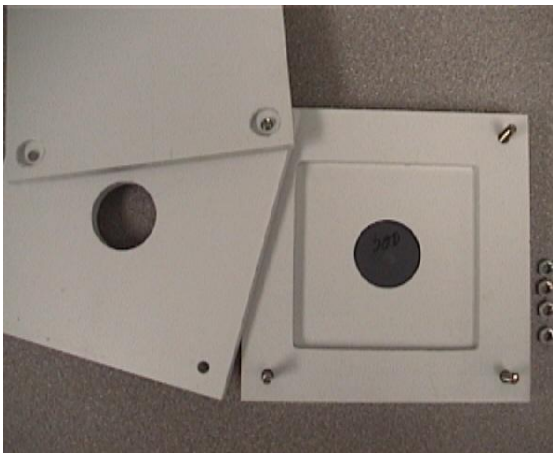
GEX Corporation recommends the utilization of NPL CIRM Report 29 as a guiding document on performing a calibration (see References).

STANDARD GAMMA PHANTOM

LARGE GAMMA PHANTOM

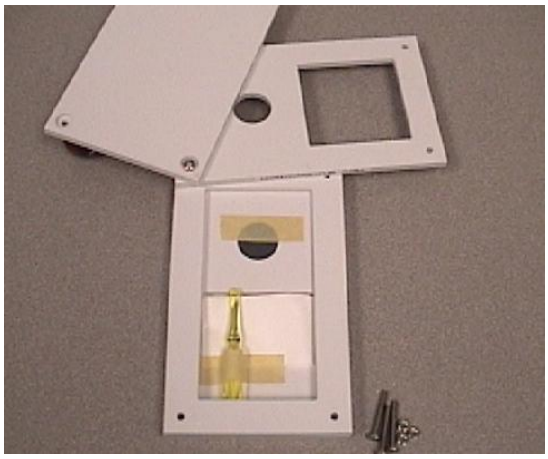
Usage:

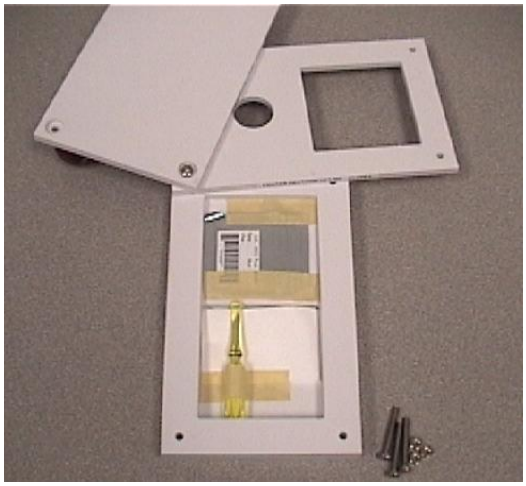
1. Remove the nuts on the calibration phantom bolts and lift off the top two polystyrene plates.
2. Record the calibration dosimeter numbers, the transfer dosimeter number and the target dose in the GEX Calibration Data Workbook or equivalent.



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.

(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.)

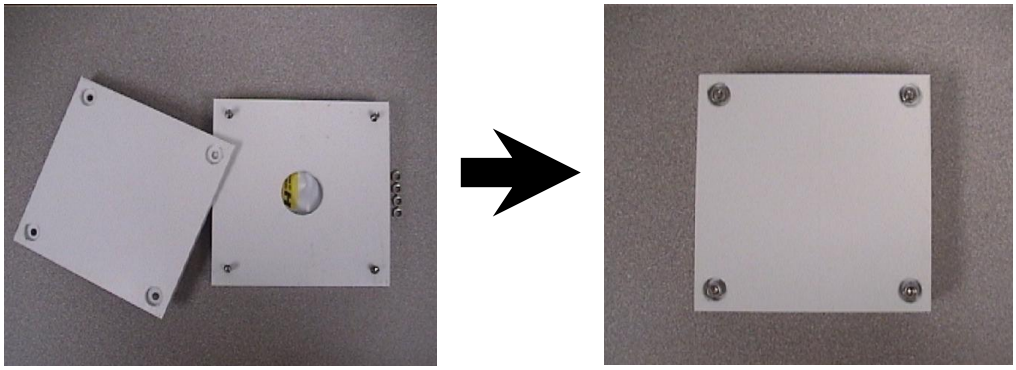




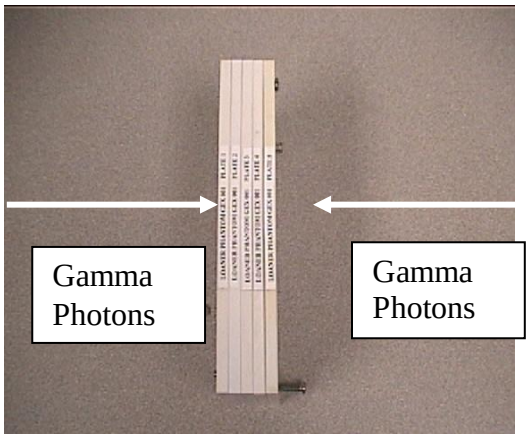
(Alternative method for P1010 and a mixture of dosimeter types: Place ampoules into the square well, the alanine transfer dosimeter into the circular well and the radiochromic dosimeter package on top of the alanine dosimeter. Do not overload the phantom; this could cause shadowing and dosimeter results 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.



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.