Technical Specification Sheet: Alanine Loose Pellet Dosimeters

Introduction

Alanine loose pellet are white cylindrical dosimeters, comprised of alanine and paraffin wax. Loose alanine pellets are typically used as reference or transfer dosimeters to measure absorbed doses of ionizing radiation and can also be used in routine dosimetry. A protective holder is recommended prior to use. Measurement of the alanine dosimeter is completed using an EPR spectrometer.

A batch of Alanine Loose Pellets is characterised by letters for example 'CW' and is defined as the manufactured quantity prior to being split into weight groups. Once each batch is weight sorted, these groups of pellets are known as lots. Lots are grouped in weights of +/- 0.6mg, and are characterised numerically, for example 'CW600'.

Dose Range

The functional dose range is dependent on the measuring equipment & conditions. When measured in a controlled environment 0.1kGy to 100kGy can be achieved, making it ideal for most irradiation processes.

Material

A white cylindrical pellet of alanine in a wax binder:
90.9% Amino acid L-alpha alanine
9.1% Paraffin wax

Alanine Pellet Dimensions

Diameter: 4.8mm +/- 0.1mm
Height: 2.8mm +/- 0.1mm
Batch Mass: 56.4 – 63.6mg +/- 0.6mg
Lot Mass: +/- 0.6mg within a lot (standard deviation 0.3mg)

Packaging

Sold as tubs of 1,000 pellets, or bottles of 10,000.

Alanine Loose Pellet Measurement Reproducibility

Irradiation response: CV up to 1.0%

Performance

- Each lot of loose pellets are verified via a third-party calibration
- Shelf life unirradiated is 8 years from date of release
- All measurements on this specification are given at a coverage factor of K=2 (providing a coverage probability of approximately 95%)

Handling Instructions

- For use with ionizing radiation only
- There is no significant influence of ambient light
- Handle dosimeters with care and do not use damaged dosimeters
- Recommend storage temperature between 15-30°C
- Do not mix dosimeter batches
- It's recommended to store the dosimeters at the same relative humidity (RH) as the ERP measurement equipment prior to use.