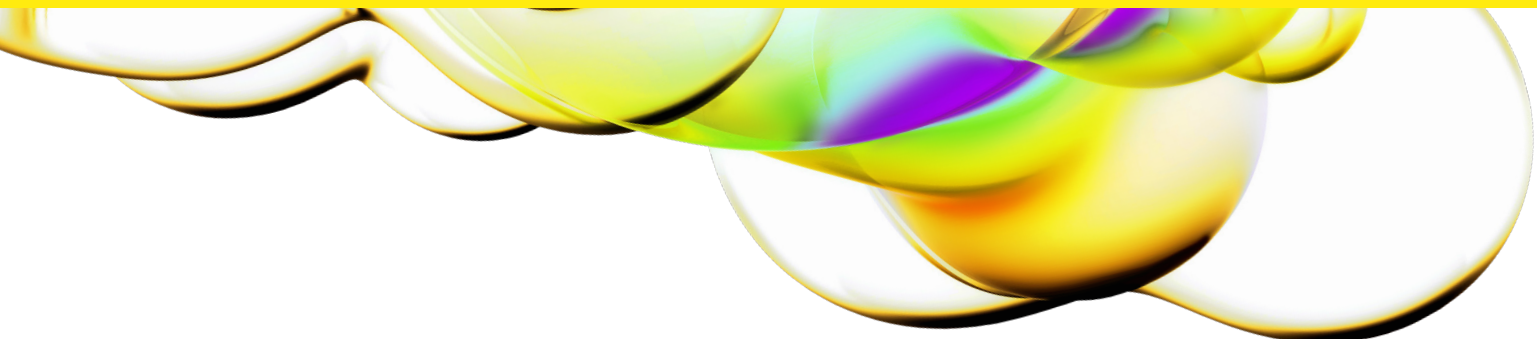


# Guard compensation.



“Guard Compensation” is a mathematical method which calculates the number of environmental background events that were not blocked or detected by a guard, and then uses this information to reduce sample background counts accordingly.

Guard Compensation Technology (GCT) determines the number of environmental background events which pass through the BGO guard undetected, and then produce scintillation events in the sample. GCT then uses this information to reduce (in real time) sample background counts caused by the environment.

**The patent pending GCT process works as follows:**

The ability of a BGO guard to detect background events from the environment is measured at our factory. These measurements are stored, and later used to calculate a set of guard efficiencies.

When a customer sample is analyzed, environmental background events are stored in parallel with sample decay events, and using previously measured guard efficiencies, the instrument calculates the number of background events that passed through the BGO guard undetected. The background events which were missed are then subtracted from the sample measurements in real time.

**In scintillation counting, if a detector’s efficiency is known, the number of events can be calculated using the equation:**

$$\text{Actual events} = \frac{\text{detected events}}{\text{efficiency}}$$

When an unknown sample is counted, the actual number of environmental background events is calculated using the first equation above. The total events the guard missed can then be calculated (ACTUAL - DETECTED) and subtracted from beta sample counts.

Finally, GCT has a tendency of working better than TR-LSC Low Level count mode when plastic or Teflon vials are used.