

Quant GR1

Unique Solution for
Mobile Laboratory
Radionuclide Analysis



Picture courtesy of EDF Energy

Quant GR1®


POWERED BY THE
WORLD'S SMALLEST
AND HIGHEST
RESOLUTION ROOM
TEMPERATURE
GAMMA-RAY
SPECTROMETER



Quant GR1 Applications

- Environmental Monitoring
- Decommissioning
- Waste Disposal
- Food Inspection



A blue-tinted photograph of an industrial facility, likely a refinery or chemical plant. The image shows a complex network of large metal pipes, valves, and structural steel beams. In the foreground, a large horizontal pipe with a valve is prominent. The background features more industrial structures and a staircase. The overall scene is dimly lit, with light reflecting off the metallic surfaces.

High accuracy and precision

Quant GR1[®] is a unique solution for measuring the activity of radionuclides in beakers.

The low power, small form factor, reliability, and no requirement for cooling, enable measurements of samples, without the need for time consuming transport back to offsite laboratory.

Quant GR1 utilises mature cadmium zinc telluride (CZT) technology, provides less than 2% energy resolution, unmatched by conventional scintillator detector based instruments such as LaBr³ and NaI. This high resolution performance enables clear separation of gamma energy peaks within complex mixed radionuclide samples for accurate quantification of individual radionuclides without the need for chemical separation.

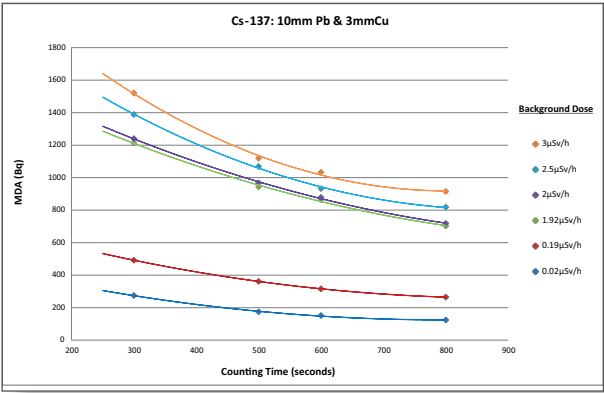
Quant GR1 comes with an optimised and integrated lead/copper shield that enables operation in both standard and raised backgrounds. The enhanced lid locking mechanism has a simple-to-use push switch, which offers positive and secure closing.

MultiSpect™ Analysis Premium Software

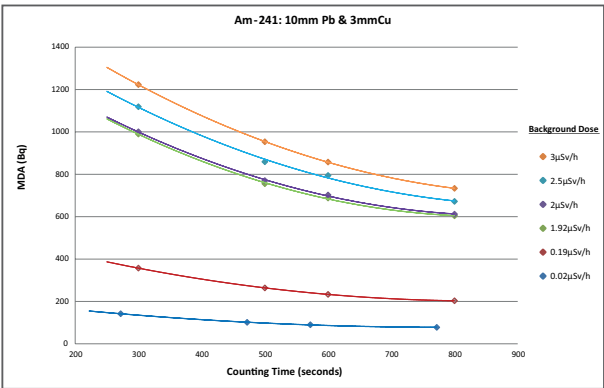
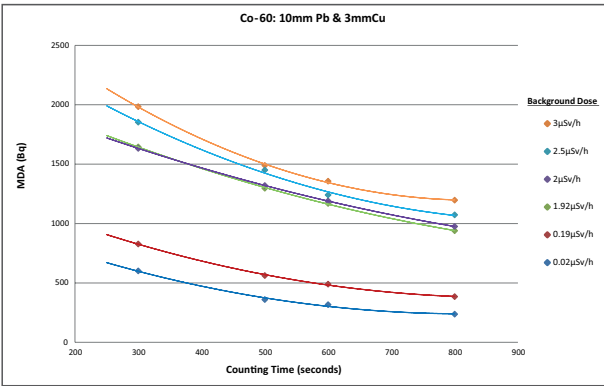
Quant GRI comes with MultiSpect Analysis Premium (MSA Premium) which includes a dedicated Quantitative Activity Analysis module. It enables full spectrum visualisation, radionuclide identification and activity analysis with adjustable confidence levels.

The results are stored within a database that can be exported to CSV file format, and reports output to PDF.

Samples can be tested in efficiency optimised beakers filled with distributed material.



MDA for 1 litre beaker with background doses for various sources



Feature-rich software



Quant GR1 comes with MultiSpect Analysis Premium (MSA Premium) which includes a dedicated Quantitative Activity Analysis module.

MultiSpect™ Analysis Premium Software

MSA Premium offers a predefined Quant GR1 geometry for samples in the provided beaker with hard-coded efficiency factors for activity analysis.

The screenshot displays the MultiSpect Analysis Premium software interface. The main window shows a spectrum plot and a table of activity analysis results. A red arrow points from the 'Activity Analysis Options' window to the 'Activity Analysis Table' window, indicating that the options allow the user to select the required statistics. Another red arrow points from the 'Activity Analysis Table' window to the 'Activity Analysis Nuclides' window, indicating that the table displays the result, uncertainty, and MDA of each selected radionuclide with the ability to export to CSV. A third red arrow points from the 'Activity Analysis Nuclides' window to the 'Activity Analysis Table' window, indicating that the user can configure the radionuclide library.

Activity Analysis Options allow the user to select the required statistics

Activity Analysis Table displays the result, uncertainty and MDA of each selected radionuclide with the ability to export to CSV

User configurable radionuclide library

MSA Premium Features Relevant to Quant GR1	
User definable confidence limits	✓
Quantitative library of 3 nuclides	✓
User ability to add energy and efficiency calibrations for further quantitative analysis	✓
User customisable libraries	✓
Display calibrated spectra at the same energy scales to allow comparison	✓
Thumbnail indication of loaded spectra	✓
Ability to save spectra in SPE or CSV formats	✓
Ability to export data	✓
Ability to save detector calibration information	✓
Association of calibration data with particular detectors by serial number	✓
Aggregation of multiple spectra into one spectrum	✓
Built in library of 416 isotopes for identification and basic analysis	✓
Industry standard categorisation of isotopes	✓
Automated peak analysis of Spectra	✓

The screenshot displays the MultiSpect Analysis Premium software interface. The main window shows a spectrum plot and a table of activity analysis results. A red arrow points from the 'Peak Analysis Options' window to the 'Activity Analysis Options' window, indicating that the options allow the user to select the required statistics. Another red arrow points from the 'Activity Analysis Options' window to the 'Activity Analysis Table' window, indicating that the table displays the result, uncertainty, and MDA of each selected radionuclide with the ability to export to CSV. A third red arrow points from the 'Activity Analysis Table' window to the 'Activity Analysis Nuclides' window, indicating that the user can configure the radionuclide library.

Configuration options for the analysis based on statistical significance.

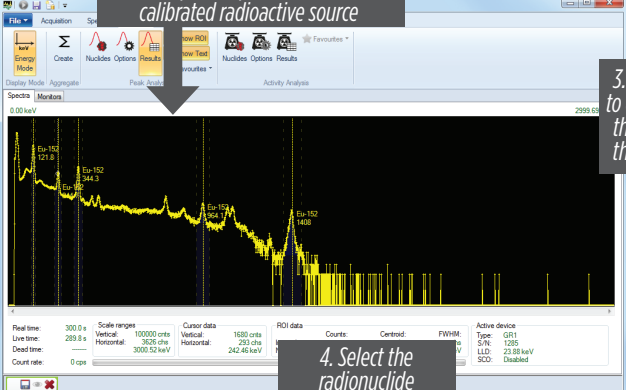
Drivers available for both Windows® (7, 8, & 10) and Linux® operating systems

Manual Efficiency Calibration

Where the detector and radioactive sources are used in a fixed geometry, an efficiency calibration of the system can be used, together with the measured count rates in spectrum peaks, to

calculate source activity. Tools are provided allowing the user to determine the efficiency of their system using a calibration source of known activity.

1. Acquire a spectrum from a calibrated radioactive source

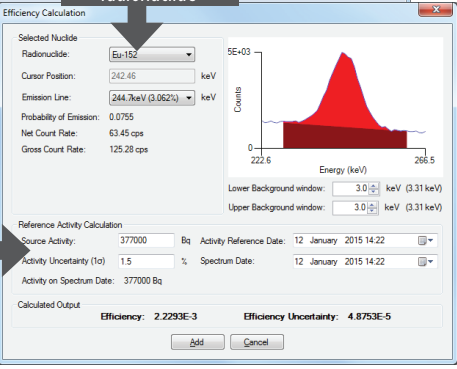


2. New 'Efficiency Calibration' tab in 'Device Settings'



3. Click 'Add Cursor Point' to calculate efficiency from the acquired spectrum at the position of the cursor

4. Select the radionuclide

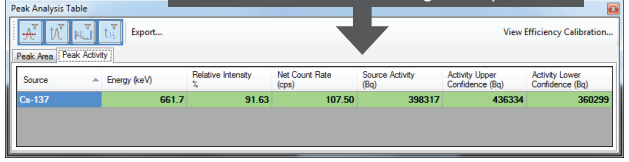


5. Enter the source activity and MultiSpect calculates the efficiency value

6. Choose the equation for fitting the data

7. View the fit confidence limits graphically to check the quality of the calibration, then save as a 'Favourite' for future use

8. Calculate the activity of any radioactive source measured in the same geometry



Standard kit includes:

- Quant GR1 device including optimised background shield
- Integrated GR1+ <2% resolution
- MultiSpect Analysis Premium Software - Licence key provided with device
- Quant GR1 Beaker (1L)
- Custom built PELI case



Accessories:

- Q4GR-002-OE - Quant GR1 Beaker 1L (Pack of 1)
- Q4GR-003-OE - Quant GR1 Beaker 1L (Pack of 5)