Success Story

SUCCESSFUL CUSTOM PROJECT: LAUNDRY CONTAMINATION MONITOR FOR KTE-KARLSRUHE

In December 2025 Berthold Customer Project Group Radiation Protection (RP) successfully installed and setup of one of our most recent individual solution projects: a laundry contamination monitoring system in Karlsruhe.

KTE (Kerntechnische Entsorgung Karlsruhe) is a company that bundles all dismantling activities regarding the decommissioned nuclear research and prototype plants and the necessary disposal activities at the Karlsruhe/KIT Campus North site. Marvin Haas, Radiation Protection Instrumentation specialist at KTE, is telling us more about the project from a customer perspective.



Figure 1: One of the measuring units with pieces of clothing going in (left) and out (right).

Hello Marvin, thanks for finding the time to talk to us. KTE's premises are rather extensive, with many buildings and facilities. What specific facility was equipped by Berthold within this project? What are its main activities regarding radiation protection?

It's the laundry building. There, uniforms, coats and other pieces of clothing are washed and prepared for subsequent use. An important step is to ensure that washing has removed any traces of radioactive contamination, hence the need of a laundry contamination monitor.

What were the requirements of the project?

The main requirements were:

1. Simultaneous measurement of alpha and beta/gamma radioactive contamination.
2. Lowest limit of detection of 0.02 Bq/cm^2 for alpha and 0.2 Bq/cm^2 for beta radiation.

3. A detector surface of at least 14400 cm^2.
4. The system must be able to measure pieces of clothing of 180 x 80 cm.
5. Easy handling.
6. Pre-fitting of the garments.
7. Automated operation.

And, of course, the system had to fit the room that was assigned for this task.

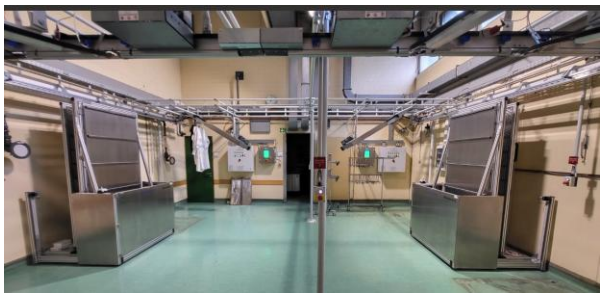


Figure 2: General view of the laundry contamination monitoring system

What did Berthold's offer consist of? To what extent did the offer fulfil the requirements?

Berthold offered two complete monitoring systems, each one including conveyor unit and measuring unit, to be installed in the same room, one system at each side of the room. The main components of each system were:

Overhead conveyor system, consisting of the following main components:

- Pawl conveyor
- Hook transport system
- PIN conveyor
- Pneumatic discharge via three chute rods with the following sorting:
  - Non-contaminated
  - Contamination level I
  - Contamination level II
- Control cabinet with control system (Siemens S7) and fault indication panel

Measuring unit, consisting of the following main components:

- Detection unit comprising two detector walls, one of which is movable, each equipped with 20 PDK 860 detectors.
- Control cabinet for the counting gas supply, including the gas management system.
- Control cabinet with display and operator interface featuring a 10.1-inch touchscreen, as well as I/O modules and additional electrical components (such as power supplies, etc.).



Figure 3: Detail views of the measuring system (left) and screen (right)

This approach completely fulfilled the requirements of the project:

Detection limits exceeded the specifications, especially for beta radiation: using an averaging area of 300 cm^2, and a measurement time of 20 s, a detection limit of 0,017 Bq/cm^2 was achieved for alpha radiation (^{238}Pu), and 0,048 Bq/cm^2 for beta (^{36}Cl).

In addition, as each system was designed to fit the walls at one side of the assigned room, the complete system leaves the centre of the

room free, without obstructing the movement of staff or the access to doors or corridors. This way, operation is hassle-free and contamination monitoring integrates very nicely with the rest of activities in the facility.

Why did you choose Berthold's solution?

We have had good experiences with Berthold in the past with many products, including other contamination monitors, and the overall package comprising the laundry monitor and the personalised service offered by Berthold was the most suitable for our purposes. The system was purchased by public tender, and Berthold's positive qualities were reflected in the scores, as Berthold's offer fully complied with each of the points listed above and got the best score.

Is there anything else you'd like to comment about this project?

Well, we have had Berthold's laundry contamination monitoring system running for close to 6 months now and it has scanned around 1900 pieces of laundry per week without any significant problems.

The system can handle 300 items of laundry per hour. This means there is sufficient capacity, even if one system were to be unavailable due to maintenance or a breakdown. We are very satisfied with the system.

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