HELGESON
SCIENTIFIC SERVICES

BNC · HEMCHEK INSTRUMENTS, INC. · SCIONIX · Panasonic · DOSImetrics · BSI BALTIC SCIENTIFIC INSTRUMENTS

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HISTORY

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HECM-2

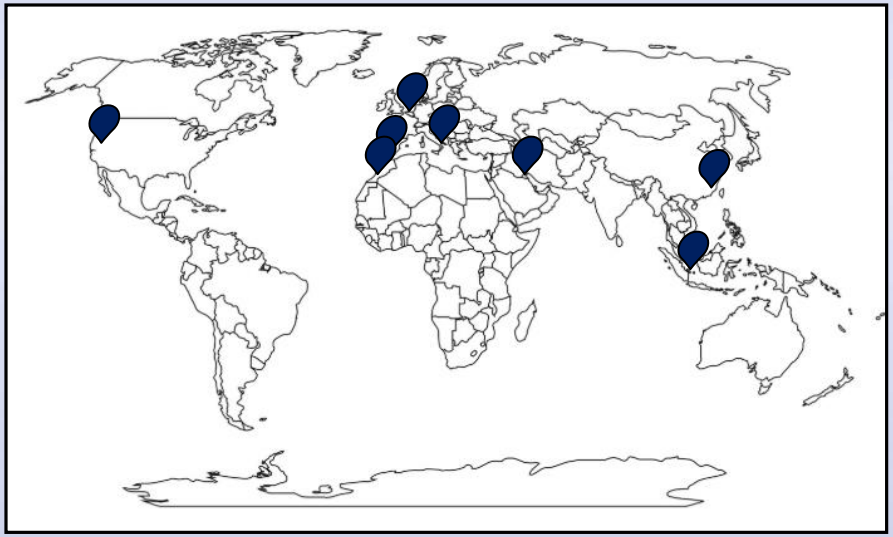
Mini-HECM

Quicky VI

Quicky III

In 1966, a group of engineers from Los Álamos, Vallecitos y Nat. Livermore Labs. founded in Pleasanton (California), Helgeson Nuclear Services with the commitment of designing, manufacturing and delivering top tier detection equipment.

We currently operate from Spain. We are present in all the Spanish NPPs since 1985. All our equipment works continuously since then due to our maintenance program that guarantees the long term performance of the equipment. We have customer all around the world: USA, Belgium, Slovakia, Morocco, Middle East, Malaysia, Taiwan, etc.



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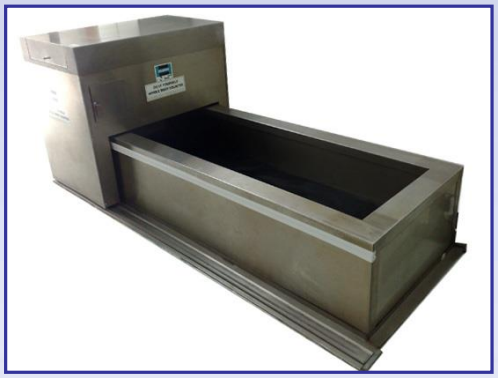
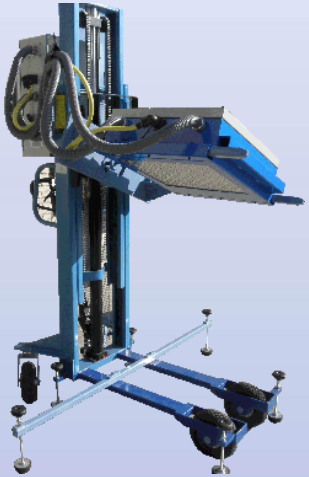
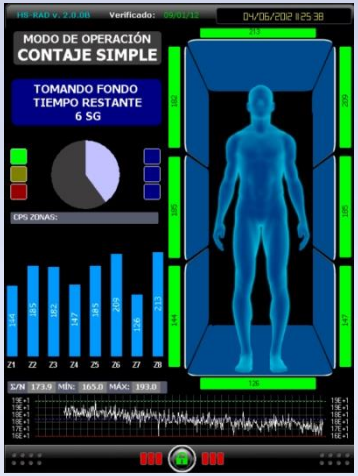
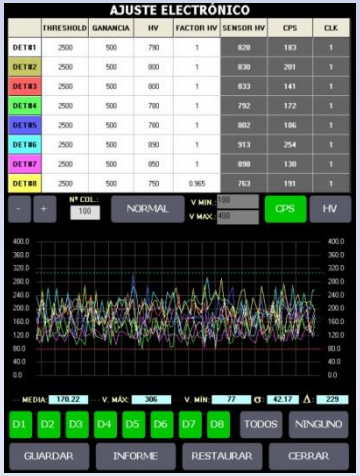
Equipment





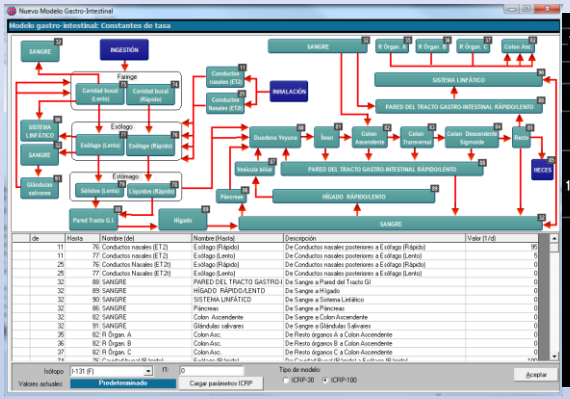
Software

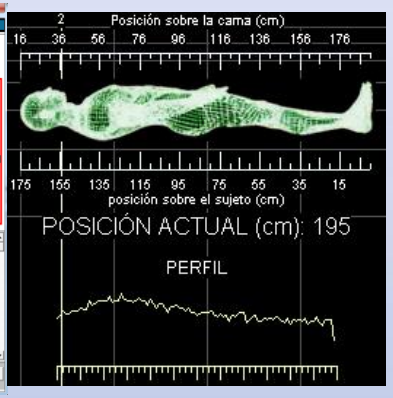




Applications for user friendly management of our systems. Alarm settings, detector configuration, calibration, data base, voice messages, etc.

Software for internal dosimetry assessment following latest ICRP recommendations regarding retention and metabolic models.





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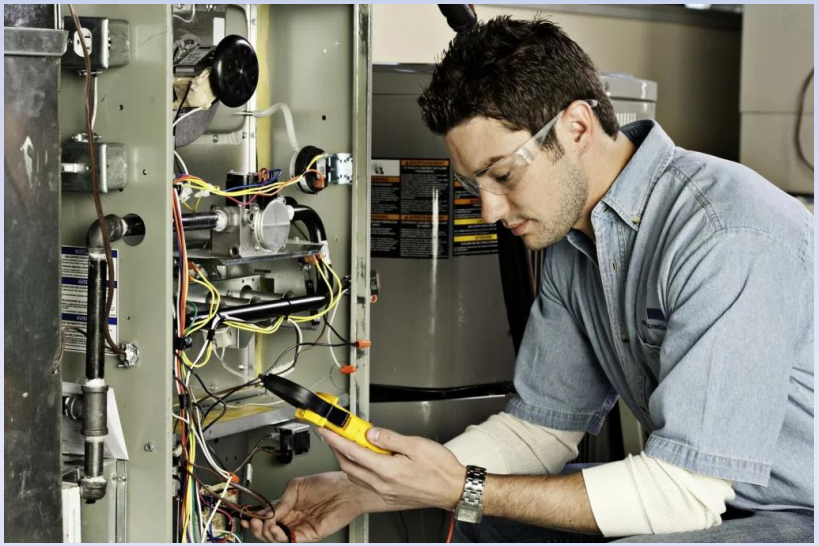
Services - Maintenance and operation



Maintenance of critical equipment like portal monitors (Helgeson and Mirion/Canberra), TLD systems (Panasonic), hand held equipment, HPGe systems, etc.

Operation of waste characterization equipment based in HPGe or scintillators (e.g. Canberra ISOCS, BSI Hercules or Monolith) including Montecarlo simulation.

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Soil Segretation Unit

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Waste to be treated

Soil/sand

The nature of the soil to be monitored depends on the location where the contamination was produced and can include several type of debris (concrete blocks, etc.).

The system can be designed to screen and segregate different types of soil.

Depending on the radiation to be monitored (alpha. beta or gamma) different processes shall be considered.

Standard Configuration

Automated system inside a customized container with external control room.

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Standard Configuration

Two independent trains in order to operate in paralel or just with one of them

Standard Configuration

The conveyors include a hopper with a screening mesh to avoid big rocks to enter into the system and damage the detectors.

Standard Configuration

The conveyors are covered with lids in order to avoid exposure of the material during the transportation.

Standard Configuration

Once inside the container, the material is analyzed in the selected detection system.

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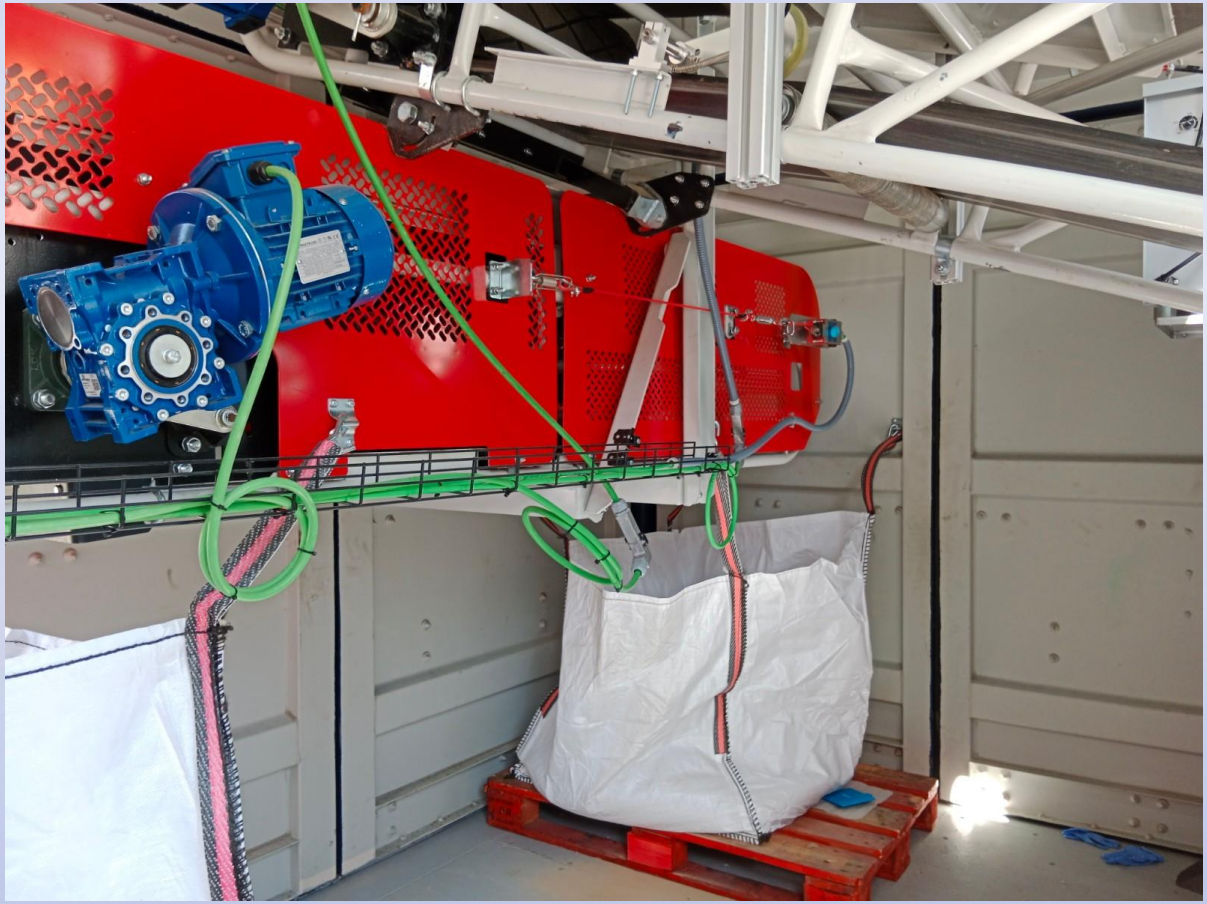
Standard Configuration

After the completion of the analysis, the material is shifted to another conveyor that transports it to the final big bag depending on the results of the analysis.



Standard Configuration

Once the big bags are full, they can be removed by means of forklift through the container side door.

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Standard Configuration

The container is equipped with a alpha/beta airborne contamination monitor to check the potential contamination in the air inside the container.

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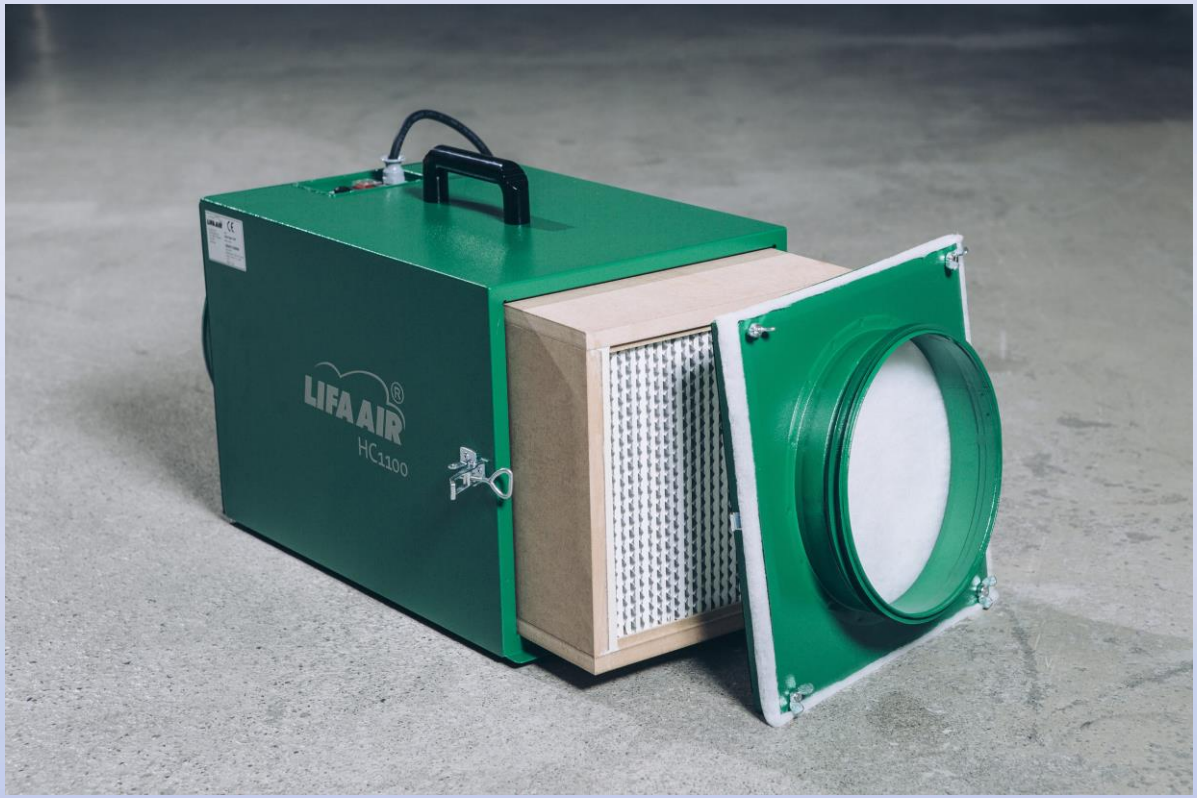
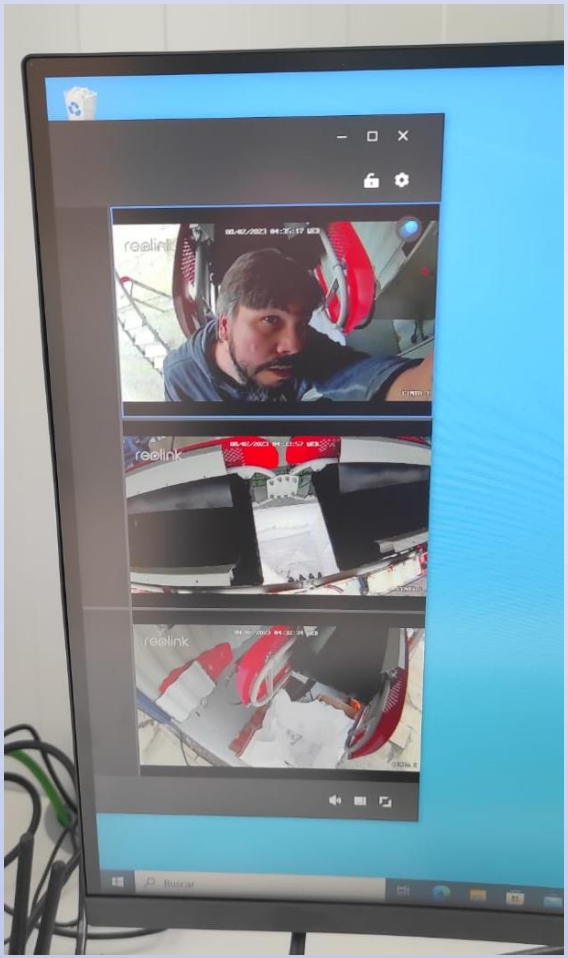
Standard Configuration

An exhausted air system with HEPA filters is also installed inside the container to maintain a proper atmosphere.



Standard Configuration

A CCTV system allows the operator to check all the process remotely from the control room.



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Standard Configuration

Control room is equipped with an office and a desktop PC from where the whole process is controlled. The control room includes air conditioning system.

Radiation to be measured

Alpha and beta: typical radiation emitted by natural radionuclides from U and Th decay chains. Their penetration power is low what leads to:

1) Small thickness of soil to measure in order to avoid self-absorption
2) Dry material since water can interfere in the measurement
3) Sensitive detectors

Gamma: also emitted by some natural nuclides. Its penetration energy is very high what leads to:

1) Bigger thickness of soil (even rocks and gravel)
2) Stronger and resistant detectors

Working Capacity

The working capacity is defined by:

1) Radiation to be measured: higher the thickness the higher the throughput
2) Measuring time: depends on the minimum detectable activity to be measured

For measuring beta emitters, the thickness considered is about 0,5 – 1 cm, with a surface of 50 x 50 cm. It means that approximately 1,5 kg of soil are measured every 30 seconds (i.e. approx. 180 kg/h per train).

The throughput is not as important as the reliability in the measurement. Be sure that what you are measuring is correct (better to go slowly and safe than fast and inaccurate).

Soil Segregation Unit – Operation

Human resources:

1) One unit operator (to fill the hoppers and check the system)
2) Radiation protection officer is recommended to perform or validate the clearance of the soil according to the approved methodology, and monitor the radiation levels in the unit

Utilities and consumables:

1) Power (approx. 20 kW)
2) Operation consumables: grease, mylar, etc. Very low operating cost.

Soil Segregation Unit – Notes & Recommendations

1) Installed under shelter or warehouse, covered from direct exposure to sun and climate events (not mandatory)
2) Enough space to maneuver with a forklift
3) Simple installation with a crane truck

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