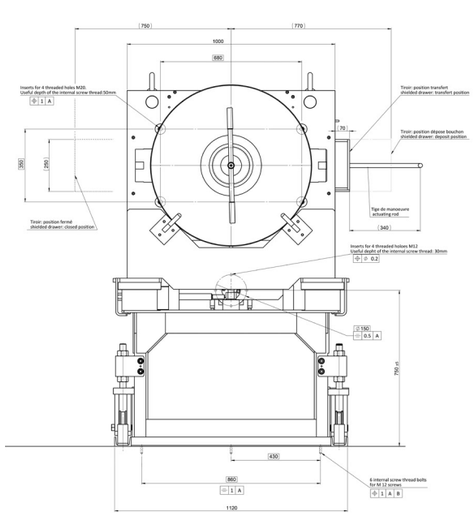
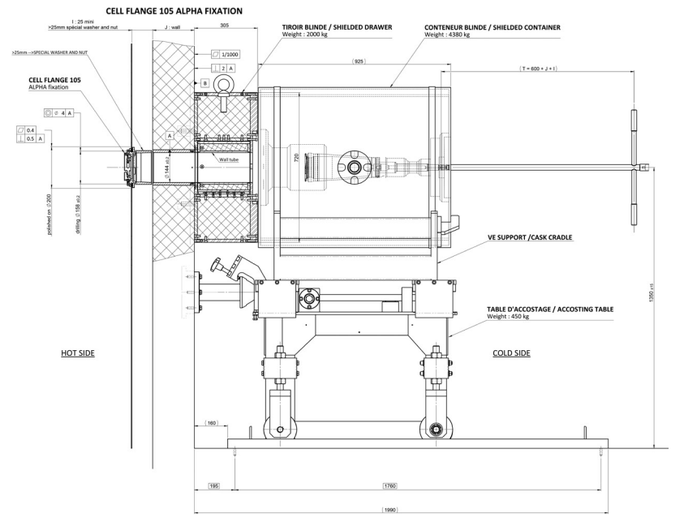
AGNES Technical Notes





LACALHENE

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LaCalhene is an equipment manufacturer specialized in material to protect human beings in a hostile environment, protect a product against the surrounding environment, and protect the environment from hazardous products. Its customer base is half in the nuclear field and half in the pharmaceutical field.
In the nuclear sector LaCalhene supplies 4 product lines: remote manipulators, transfer systems (the DPTE® range, standard and special applications), glove box ports, and shielded casks for transfer / transport. LaCalhene supplies to 5 market segments: nuclear fuel manufacture, spent fuel recycling, radiopharmacy, laboratory / universities / units of research, and dismantling / decommissioning / sanitization.

On the basis of its long experience in the nuclear sector, Getinge La Calhène developed a set of solutions and equipment for the pharmaceutical industry, in particular for isolators and sterile transfer systems (DPTE® and DPTE-BetaBag®).

LaCalhene is an active member of:

AGNES

Transport and transfer solution inside hot cells and pools

A cask for transporting material on public roads - load under water or in hot cells and unload in shielded zones

Thanks to its DPTE® interface, the AGNES cask is immersible for loading in a pool (reactor) and unloading in a hot cell, without breaking containment or shielding.

The AGNES cask was designed to transport irradiated uranium 235 targets (HEU or LEU), i.e. for nuclear medicine applications. Other possibilities for use can be considered.

It supplies biological protection and containment, providing safe and simple use for the operator.

The AGNES cask, with its transport accessories (cover, flange, etc.) is certified for transporting materials on public roads (Type B certification).

AGNES Cask in swing arm: short + long versions

Features

Transport: emballage de type B (U).

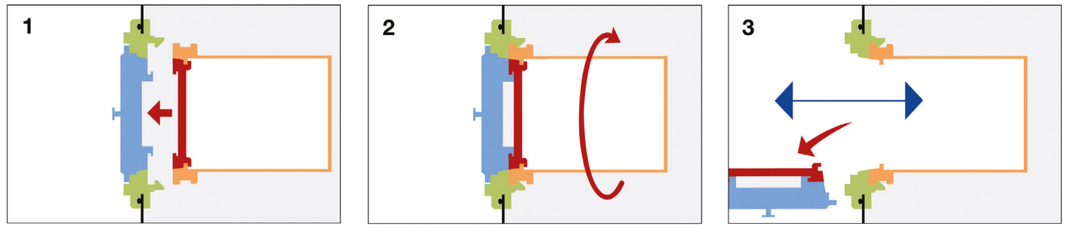
Alpha leaktightness (2 successive barriers):
- A DPTE® 105 type container.
- Cask is put under vacuum before transport.

Gamma shielding:
- 230 mm lead.
- Removable gamma lead plug.

Thermal and mechanical protection:
- Double-skinned structure with thermal protection.
- End covers with thermal protection and energy-absorbent spacers for falls.
- Stainless steel single piece internal sleeve.

DPTE ®, or Double Porte de Transfert Etanche

A solution to avoid breach of containment during products transfers.

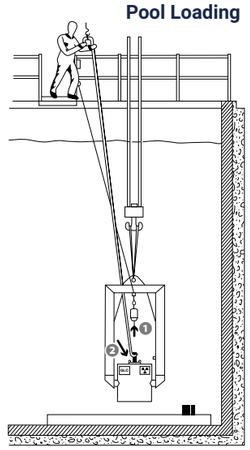


During connection by 60° rotation, both ports Alpha and Beta of our unique LaCalhene system, join together to form a single unit. At the same time both doors are detached from their respective flanges and fixed together, while the flanges and seals continue to maintain leaktightness of this new joined assembly.

Operating Principle

- Pool loading: the DPTE® having previously been opened, the gamma plug removed, ❶ (by a cable fixed to the swing arm), the targets are placed in their housings ❷ using a remove manipulation device.
- Draining / Drying: the gamma plug is replaced, the cask is brought to the poolside and tilted to drain out any water, then vacuum dried once the DPTE® container is closed.
- Transport: the cask is put under vacuum and the transport equipment (cover and flange) is installed.
- Transfer to shielded zone: the container is placed horizontally on a cradle-support. The cluster holder is pushed through a shielded door with drawer on the DPTE®, the cask protection plug having already been placed in the door drawer.

Pool Loading

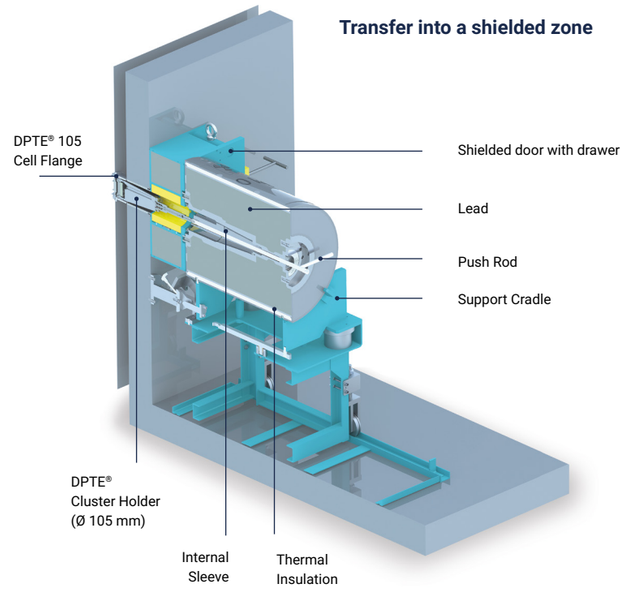


System Components

The system consists of:

- Pool loading phase: cradle, long swing arm, pushing rod, loading funnel, vacuum pump and drying suction plunger.
- Transport phase: end covers, flanges.
- Unloading / transfer to a contained zone phase:
  - Fixed part on the contained zone, consisting of a shielded drawer and a DPTE® 105.
  - Mobile part consisting of the cask itself placed on a mobile table. The DPTE® 105 cluster holder is handled using the push rod.
  - Accessories: short swing arm and degassing tools.

Transfer into a shielded zone



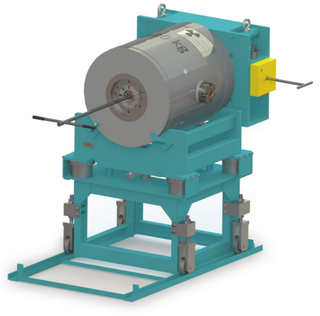
Dimensions

Transport Cover:
Maximum External Diameter: 1664 mm
Overall Height: 1703 mm

AGNES Cask:
Weight: 4380 kg
External Diameter: 776 mm
Overall Height: 985 mm

Internal Container:
Maximum Diameter: 138 mm
Overall Height: 680 mm

Docking



Transport Shell