

PLATOM's Expertise and Capabilities to Support Construction and Operation of Hot Cell Facilities

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Platom is a consulting company with more than 30 years' experience in providing nuclear industry with services covering, e.g., radioactive waste treatment management, equipment and process system deliveries, modelling and simulation of NPP processes and control systems as well as design and delivery of I&C systems.

Platom has designed, supplied and commissioned evaporation and waste treatment box to be used in Hot Cell applications. In addition, we have practical experience of Hot Cell laboratory work with several techniques, e.g., crack growth rate testing of irradiated stainless steels, mechanical testing of irradiated reactor pressure vessel materials and Electro-Discharge Machining (EDM) of irradiated materials.

Design, Manufacturing and Commissioning of Evaporation and Waste Treatment Box for Hot Cell Laboratory

Design Requirements. The safety requirements for the equipment are set in Regulatory Guide ST 6.1, "Radiation Safety when using unsealed sources". In addition, the requirements in the Government Decree 400/2008 on the Safety of Machines were considered in the design process.

Manufacturing. The above-mentioned Regulatory Guide 6.1 and Government Decree 400/2008 were also the main guiding documents during the manufacturing of the evaporation and waste treatment box. All the surfaces which are subjected to radioactivity, are made of materials which are easy to decontaminate. All the sub-suppliers were approved by Platom before starting the manufacturing of the equipment.

The structure of the evaporation and waste treatment box. The main parts of the evaporation and waste treatment box are:

- ▶ radiation-shielded drum
- ▶ evaporation and waste treatment box
- ▶ drying equipment

The picture of the box during assembly work is presented in Figure P4.



Figure P4: The evaporation and waste treatment box during assembly work.

The main components of the evaporation and waste treatment box are presented in Figure P5. The operating principle is shortly described in Ch. 3.

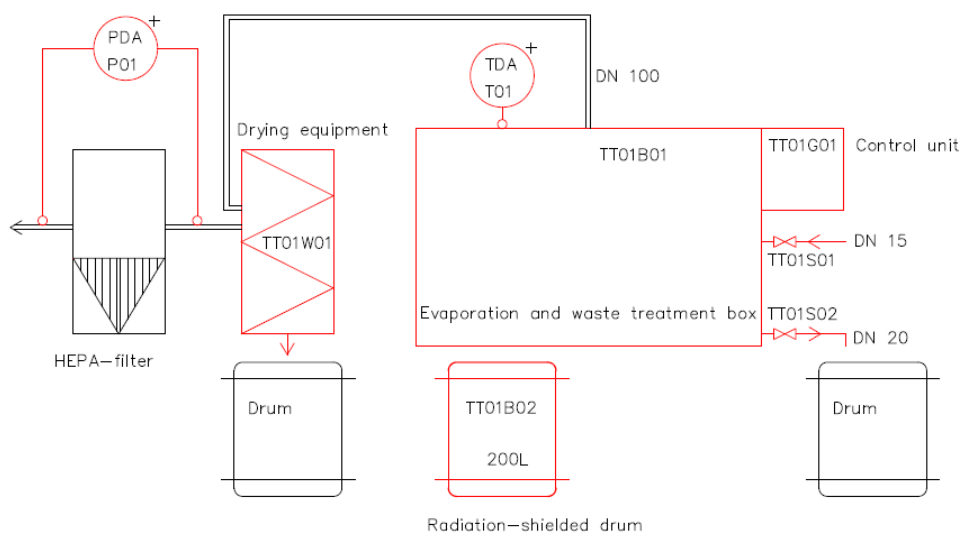


Figure P5: The main components of the evaporation and waste treatment box.

Operating principles of the evaporation and waste treatment box

Liquid radioactive waste will be transported in 200 l drums, with or without radiation shield, depending on the dose rate. The drum is positioned underneath the box, and external heaters are connected around the drum. The drum is lifted so, that it can be tightly connected to the box. The progress of the evaporation process can be followed with mirrors. When the waste is dry, the drum will be detached, covered and transferred to the storage or to the customer.

If the dried waste needs to be solidified, this can be done in the mixer placed in the box. The recipes are determined case-by-case, and different types of sorbents can be utilised.

Different types of wastes, including ion exchange resins, solvents and oils, can be solidified with this equipment.