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smart ideas for wastewater & air treatment

NUCLEANTECH®

NUCLEAR WASTE DISPOSAL REDUCTION (NWDR)

CONCEPT

The objective of this process is to minimize the solid waste generated at nuclear facilities, be it fuel preparation plants or nuclear plants. A series of products are used at these facilities (gloves, masks, clothes, pallet wood, plastics, etc.) which once used must be removed, and given the strict standards regulating the sector and the fact that they can carry particles of low and medium activity, their management as nuclear waste is very expensive.

This innovative process was designed to reduce this solid waste to the maximum, so that the solid waste that is finally managed as nuclear waste is a very small proportion of the initial volume.

Unlike the typical incineration process, where permitted by standards, this process can be carried out on site.

TECHNICAL CHARACTERISTICS

- Process based on pyrolysis and catalytic thermal oxidation to guarantee the maximum effectiveness of the treatment .
- Reduction of the original volume of the solid waste of low and intermediate level (LILW) by around 90%.
- Strict compliance with the most demanding standards.

PROCESS

The process is characterized by the treatment of low activity solid waste generated at nuclear facilities (protection equipment, clothes, footwear, plastics, pallet wood, etc.) through a pyrolysis process, in the absence of oxygen, so that a small volume solid fraction is obtained (chart), a liquid stream and a gas fraction (syngas). The liquid stream once treated to be concentrated and is stabilized in solid medium. The syngas, which is a mixture of hydrogen, carbon monoxide, methane, short-chain hydrocarbons, benzene, etc., are converted to carbon dioxide and water by means of a catalytic thermal oxidation process. In this manner, the initial solid waste is converted into a minute fraction of the individual waste, as well as a gas stream that can be released to the atmosphere with total ease after passing the strictest of environmental controls.

APPLICATIONS

The **NUCLEANTECH® NWDR** applies to all facilities that manipulate radioactive species and generate solid waste, despite the fact that their radioactivity is very low.

ADVANTAGES

- Ash which is potentially very contaminating is not generated.
- Dioxins and furans avoided.
- On-site process, without the need to transport the waste to be treated.
- As oxygen is not used, new radioactive species are not generated, such as 14CO or $14CO_2$.
- Significant reduction in the management cost of solid waste produced.
- Relevant reduction in environmental impact compared to conventional management of solid waste.

PROCESS DIAGRAM