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WASTE-07

# High Intensity Focused Ultrasound for Decontamination of Complex Metal Wastes

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**High Intensity Focused Ultrasound(HIFU)**  
is a technology to safely and effectively  
decontaminate metal wastes of various shapes  
from nuclear power plants and nuclear fuel  
fabrication facilities.

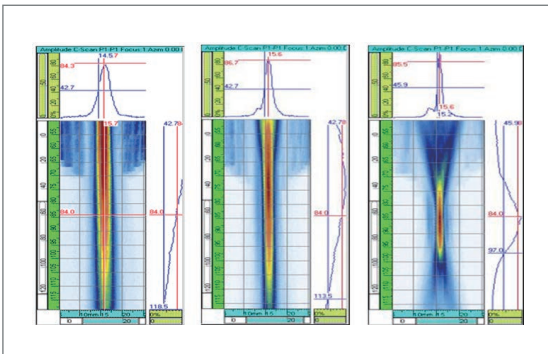
## Description

### ● Background

- As metal wastes that existing methods (molten salt, conventional ultrasound) cannot decontaminate are increasingly generated, developing a technology to treat them is required.

### ● Purpose

- To develop a technology that can effectively and safely decontaminate metal wastes contaminated with uranium of various sizes
- To develop a technology that can decontaminate metal wastes up to the level of self-disposal and quickly decontaminate them over a wide range of areas



< Performance verification using beam simulation >



< Fabrication of hemispherical oscillator >

**● Contents**

- HIFU technology can decontaminate complex metal wastes.
- The technology has a 3-step decontamination system (50, 100, 200 kHz)
  - \* Low frequency(for large particles) → Area-focused high frequency(for small particles) → Point-focused high frequency(for fine particles)
- It is effective in decontaminating highly contaminated complex metal wastes such as pipes, bolts and nuts, components of the motor etc.

- Metal wastes that conventional methods cannot decontaminate can be decontaminated by HIFU technology.

**Technology Readiness Level (TRL)**

Field demonstration of Prototype

**Experience**

- The HIFU devices will be operated from the first half of 2023

**Business Model**

- Technology Transfer
- Licensing
- Joint Search
- Service Execution**
- Others

**Distinctiveness**

**● Characteristics**

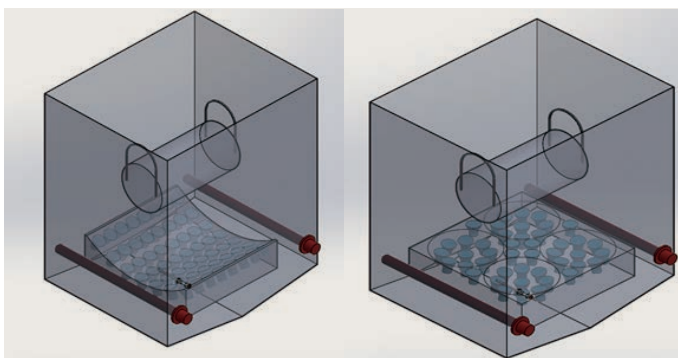
- It is possible to decontaminate metal wastes up to the level of self-disposal.
- It is possible to decontaminate fine particles with more than 100 times stronger energy than conventional ultrasonic technology.

**● Benefits**

- It can be applied immediately to the decontamination of complex metal wastes generated in large quantities during the operation of nuclear power plants.

**Deliverables**

- Design and production of the HIFU devices



< HIFU system schematic diagram >



< Before decontamination >

< After decontamination >