

Treatment of secondary waste produced from the Waterjet Abrasive Suspension Cutting using separation techniques and to recycle the abrasive material (NaMaSK)

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Context

Water Abrasive Suspension Cutting (WAS) process is commonly used for the dismantling of a reactor pressure vessel and its internals. The cutting tool is capable of slicing metallic internals and other materials using a pure jet of water mixed with an abrasive substance at high velocity and pressure. The process offers numerous technical advantages, but it has a major disadvantage in producing secondary waste. Due to the addition of abrasive, the WAS process produces a waste mixture of inactive abrasive particles and radioactive steel particles (activated by neutron radiation) during the dismantling of steel components in nuclear facilities.

Aim of the Project

The research project aims to separate the two fractions (abrasive and steel particles) with the help of magnetic separation and wet sieving so that abrasive generated by the WAS process can be reused. With the reuse of abrasive material, the secondary waste can be minimised. For this purpose, a prototype separation system with a sieving and magnetic filter has already been built and tested, which can separate up to 90% of the steel particles from the mixture. One goal of this follow-up project is to increase the separation quality through wet sieving and magnetic filtration. In addition, the new test plant will be designed for the separation process using radioactive material. For this purpose, the mode of operation will be converted from a batch process to a continuous operation. The separation process will be evaluated in the controlled area with a small-scale test setup employing activated materials for the suitability of the treatment for radioactive waste at our project partner institute 'Institute for Nuclear Waste Disposal'.

Advantages & Special Features

- Secondary waste minimisation during the dismantling of nuclear facilities
- Increasing the economic attractiveness of the WAS procedure
- Experiments to determine the degree of separation
- Magnetic separation
- Wet sieving

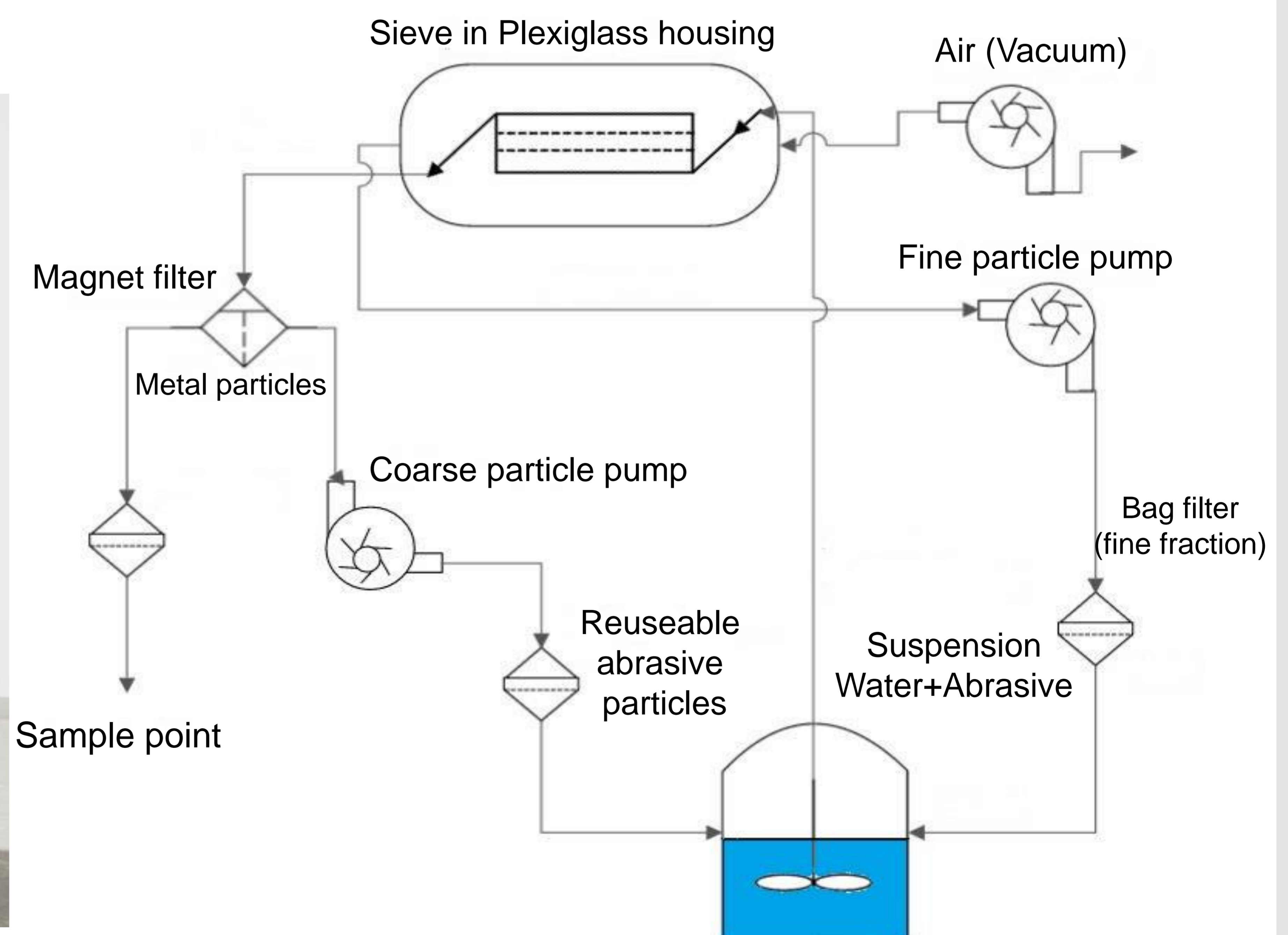
Affiliation

- Project Partner: Institut für Nuclear Waste Disposal (INE)
- Cooperation with ORANO, EnBW, and ANT-AG
- Project duration: From January 2021 till December 2023

Previous batch process (MaSK Pilot-plant)



Continuous operation for new Pilot-plant



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Rückbau konventioneller und kerntechnischer Bauwerke

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GEFÖRDERT VOM

