

## Treatment of Steel Plate Coolant Wastewater by Superconducting High Gradient Magnetic Separation

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We have developed the prototypes of superconducting magnetic separation system with high temperature superconductor wire. This separating filter system consists of magnetized matrix SUS430 wire and acrylic frame. This study introduced steel plate process coolant wastewater applied superconductor HGMS(High Gradient Magnetic Separation). Cryo-cooled NB-Ti superconducting magnet with 100 mm room temperature bore and 600 mm of height was used for magnetic separator. HGMS treatment is acted high efficient method for various wastewater. We have surveyed superconducting magnetic separation technology and reviewed the status of related industries using applied superconductivity. In our basic preliminary experiment using HGMS, it was made clear that the fine para-magnetic particles in the wastewater obtained from rolling process of steel can be separated with high efficiency. We investigated the ability of magnetic flock formation, which used inorganic materials and polymer coagulants. We had a purpose to remove SS of coolant at steel factory. Maximum coagulation remove rate of SS 98%. Removing ratio of Fe<sub>3</sub>O<sub>4</sub> fine particles in wastewater showed over than 99% in the wastewater containing magnetic fines after four times of repetition of separation..

Keywords : HGMS, superconducting magnet, steel plate coolant, filter wire