

PFC Ultrasonic Decontamination Performance on the Various Types of Metal Specimen

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A study on the decontamination of various types of SUS-304 specimens was carried out in PFC(Perfluorocarbon, C_7F_{16}) solution containing 0.1 vol% anionic surfactant at room temperature under atmospheric pressure. To make a loose contamination, metal surface was contacted with the ethyl alcohol solution which contains Eu_2O_3 powder and fluorescent material by using a syringe. Decontamination behavior of PFC ultrasonic method on the loosely contaminated metal specimens such as rectangular type, tube type, welding specimen and crevice type was investigated. After the specimen was put into the specimen chamber, the reactor was filled with PFC solution. Then the specimen was decontaminated by ultrasonic method for 5 minutes. Before and after the test, the weight of specimen was measured. The outer surface of specimen was also photographed. From the results, the weight of the total contaminants and the weight of removed contaminants were calculated. For all the rectangular type metal specimens(no scratch, linear scratch and check scratch), all of the contaminants were removed within 5 minutes. For all the specimens, more than 80 % of contaminants were removed within 1 minute after ultrasonic application. For the tube type specimens(diameter was 2cm, tube length was 1, 2, 4 and 6 cm, respectively), only the specimens with a length of 1 and 2 cm were fully decontaminated. For the length of 6 cm specimen, 98.5 % of the contaminants were removed. After the multiple applications, distillation test on the spent PFC solution was performed. More than the 95 % of the PFC solution could be recycled without the loss of decontamination efficiency.