

PORTABLE METAL DECONTAMINATION TOOL



Specialising in fast, clean, non-toxic cleaning, polishing and marking of metal, Reuter GmbH & Co KG has been manufacturing state of the art technology for the past 10 years. Their newly developed method cleans and passivates metal surfaces electrochemically, in one easy step.

Effectively upgrading a principle existing for the past 20 years, Reuter has developed a very reliable product (German build quality) and a safer option for localised metal treatment in the nuclear sector.

Representing Reuter GmbH for nuclear applications, Tech Y Tech will be your ideal partner to help you tailor the right system for your scenario.

IS THIS YOUR CHALLENGE ?

Either to reduce the dose level impact in a facility to allow for easier access during dismantling (radioprotection), to minimise the potential for spreading contamination during further dismantling (safety), to allow for the disposal of waste in a lower category or even to consider clearance of material (ALARP & cost savings), decontamination is always defined as the removal of contamination from surfaces before or after dismantling. Specifically applied to metal surfaces, hot spot or fixed contamination are typically removed so to allow maintenance, re-use or facilitate future dismantling.

For metals, technologies often rely on chemical cleaning or treatment using pre-coated wipes or other absorbent. Extensive cleaning of expensive or fragile parts can quickly become resource-intensive: more efficient and effective decontamination technologies and processes can bring significant benefits to current and future D&D projects.

Reuter GmbH has developed a new electro-decontamination method that makes most metals decontamination possible. With a flexible electrode design that guarantee an effective decontamination at all points, the innovative characteristic of this process is that it not only decontaminates the metal surface but also reduces its susceptibility to the incrustation of subsequent contamination. Its portability is also unique, making it very easy to implement and a perfect partner for glovebox or cell equipment or waste clean-up.



USER CASE 1

ORANO DS - $\beta\gamma$ Decontamination Operation - MARCOULE (FR)



MARCOULE - Clean up operation

- The contaminated area (stainless steel) included complex surfaces.
- A prior decontamination operation (using conventional labile contamination wipes) had not achieved the required residual activity values.
- Mapped by $\beta\gamma$ probe, the Reuter GmbH electro-decontamination technology achieved a confirmed 98% decontamination efficiency on flat surfaces and up to 90% of efficiency on complex and/or difficult to access areas.
- The implementation of the approach was carried out without any major difficulties and successfully achieved the targeted residual activity values.



USER CASE 2



ORANO - Metal Decontamination and Re-use - La Hague (FR)

La Hague - AD1BDH decontamination workshop

- Implementation of the new carbon fibre brush electro-erosion process.
- Alpha Fixed Contamination:
 - Impeller and 1/2 pump casing from La Hague Uranium workshop.
 - Previously been subject to wet contamination and hence with rough surfaces.
 - Two minutes of treatment enabled Decontamination Factors between 2 and 4.
- Beta-Gamma Contamination:
 - Large parts from a vitrification cell. High Beta-Gamma contamination.
 - Results achieved after prior decontamination treatments by ultrasonic baths, chemical baths and strong oxidizing treatment which didn't successfully reach the required level.
 - Exceptional Decontamination factors (DF) between 28 and 70.
 - Electro-decontamination allowed for treated pieces to reach background level.



THE TECHNOLOGY

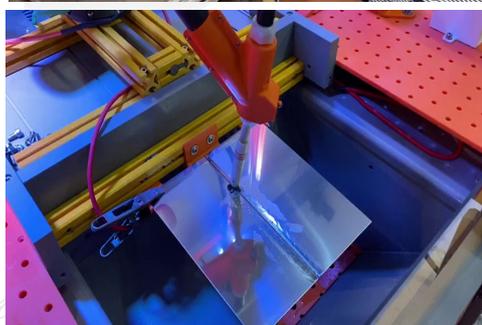
In the nuclear sector, metal surfaces used in active areas often require decontamination upon dismantling or maintenance. This is often done either chemically or mechanically. Chemical cleaning by pickling is poisonous, requires long exposure times and leaves unsightly pickling edges. Mechanical methods by brushing or grinding are not poisonous but leave residues on the surface. Blasting methods, on the other hand, are associated with high vibrations and are often impractical to deploy at the workplace. Reuter GmbH & Co have developed a highly efficient way to clean metal surfaces and welding seams electrochemically:



- In one step, this method cleans, passivates and polishes metal surfaces electrochemically. Polishing drastically reduces the incrustation of subsequent contamination, an added bonus of this specific method. The switchable AC/DC devices also facilitate direct current (DC) mode for high-gloss polishing.

- The newly developed carbon fibre brush (up to 2 million fibres are used per brush) are conducting high current to the work piece (current density up to 250 A/cm²). To maximise the cleaning, the fibres of the carbon fibre brush hug the shape of the work piece ; different brush types make any cleaning task easier and there are in-pipe brushes to allow for pipes and holes to be cleaned from the inside.

- The electrolyte liquid is used to increase electrical conductivity and provide cooling. This electrochemical decontamination process generates extremely little effluent (≈ 0.5 l / h). It is possible to rinse the treated surface or wipe it by smears. Phosphoric acid is here recommended for maintenance operations whereas it can be replaced by nitric acid for dismantling operations.



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