

OSMO – Pilot System for ThyssenKrupp Nirosta

Applied Research and Development with a Grant from the Federal Government



Together with the BFI Betriebsforschungsinstitut VDEh-Institut für Angewandte Forschung (Düsseldorf) and our customer ThyssenKrupp Nirosta (Dillenburg), OSMO Membrane Systems GmbH is developing a new environmentally friendly process for recovering valuable metal from stainless steel pickling using membrane electrolysis.

The project, which comprises construction and operation of a suitable pilot plant on the premises of the customer ThyssenKrupp Nirosta, is receiving financial support from the DBU (Deutsche Bundesstiftung Umwelt – German Environment Foundation).

Process under Pilot Test

The process under analysis in the pilot test is a three-stage process, consisting of diffusion dialysis, electro dialysis and membrane electrolysis.

The electro dialysis unit (see also *inteam* issues 2/04 and 1/05) was supplied and commissioned by OSMO in November/December 2004.

Nitrate emissions (wastewater containing nitrate) from the diffusion dialysis unit already in existence have been effectively reduced by over 50% in this way. The free acid recovery has been increased from approx. 75% to approx. 90%.

Use of membrane electrolysis would enable the materials cycle to be closed and metal recovery to take place at the same time. Appropriate pre-tests for metal separation have already been successfully carried out at OSMO as part of a university degree study.

This pilot test should now enable data to be obtained for the accurate dimensioning of a large-scale plant, as well as conclusions to be drawn on the reusability of the metal mix obtained (nickel, chrome and iron).