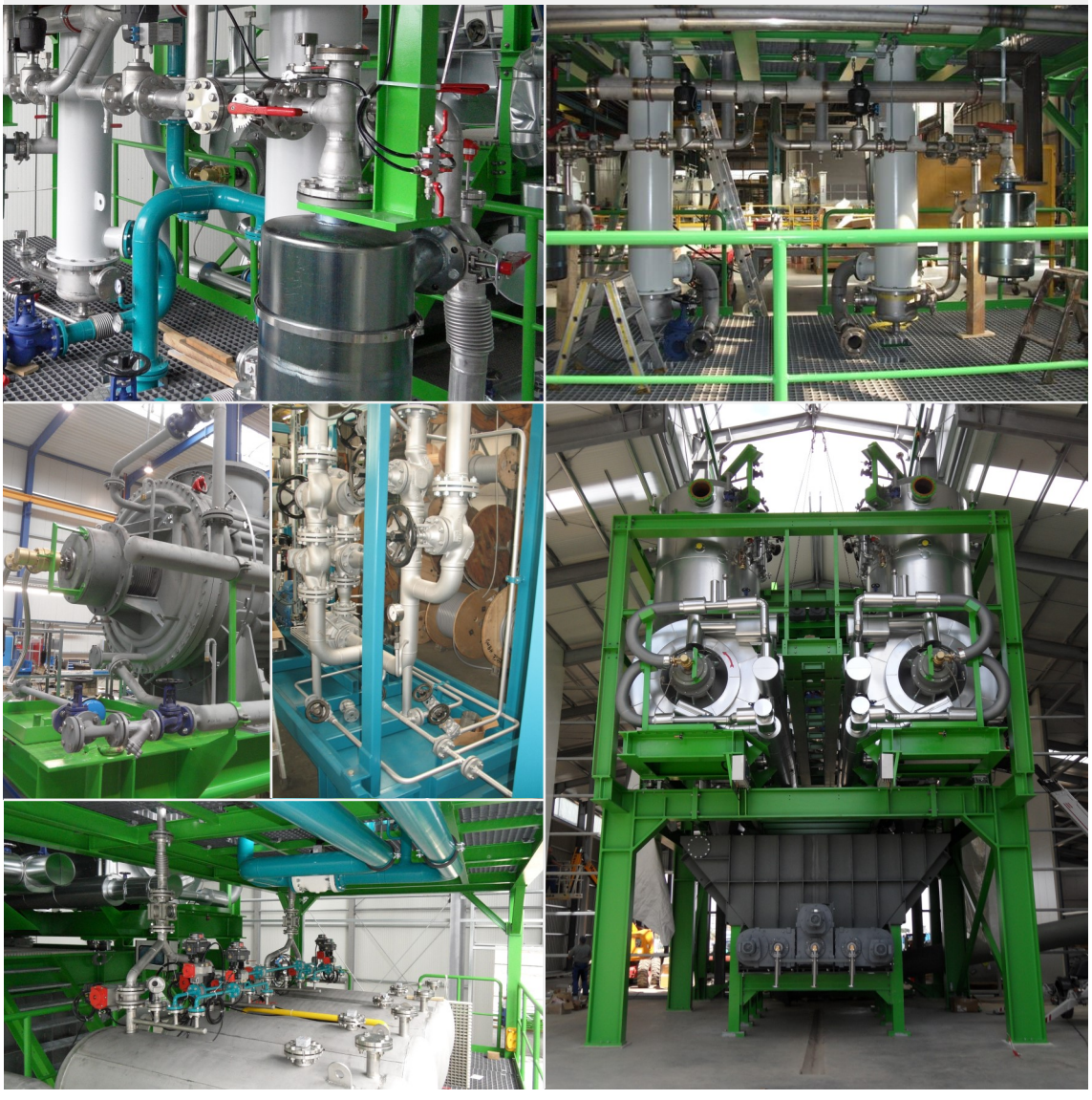
econ INDUSTRIES

Case Study

Oil and metal recovery from mill scale and grinding swarf for the metal industry



econ industries

Schiffbauerweg 1 • 82319 Starnberg • Germany

Tel.: +49 8151 446377 - 0
Fax: +49 8151 446377 - 99
E-Mail: info@econindustries.com
Web: www.econindustries.com

Zero industrial waste … !

Mill scale and grinding swarf

by econ industries VacuDry® indirect heated thermal desorption

A combination of rising prices for resources and the improvement in technology make treatment of mill scale and grinding swarf an extremely environmentally friendly and economical solution. The first VacuDry® plant for the recovery of oil solvents and metals from sludges began operating in autumn 2012.

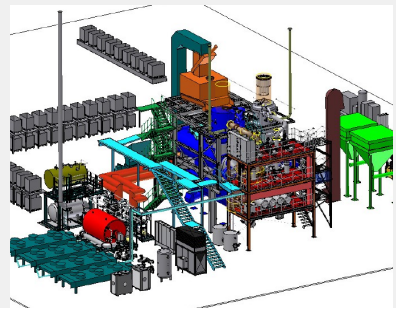
Our client is a medium-sized company operating in the field of waste recycling and production of secondary raw materials. Encouraged by rising resource costs and a high market potential our client chose building the world's first plant for the production of high quality metal alloys and silicium from waste sludges. Typical input materials for this plant are sludges derived from the processing of metal, silicium and other raw materials. The input materials contain varying combinations of oils, esters, water and abrasives. The decision for our VacuDry® thermal desorption plant offers our client the possibility to return valuable raw materials into their production cycle. In addition, this involves running the first closed loop recycling management plant for mill scale and grinding swarf.

During the treatment oils and emulsions are retrieved in a two step distillation process at temperatures of up to 300 °C and partial vacuum down to 50 mbar. In the first step water and volatile substances are separated, and in the second step oils and pollutants are separated. This special process permits the retrieval of oils and emulsions without changing their chemical structures. The absence of oxygen during the process prevents oxidation and therewith changes of the chemical structure of metals and alloys.

Performance data

- Vacuum dryer type: 2 x VacuDry® 12,000
- Batch size: 16,800 litres
- Throughput capacity: 5 t/h
- Heating system: 400 °C thermal oil unit - heated by natural gas
- Operating pressure: 50 - 800 mbar(abs)

Vapour filter



3D model

Detail of the thermal oil heating

Design characteristics

- Special vacuum tight discharge system for separation
- Two condensate lines for contaminants, stand-by solution for highest plant availability
- O_2 free atmosphere preventing oxidation or chemical changes of metals and alloys
- Accurate monitoring of the desorption and condensation processes to ensure the highest possible quality
- Optimal accessibility for maintenance and repair work
- Additional flushing device for cleaning of piping system