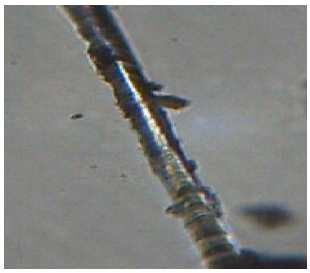
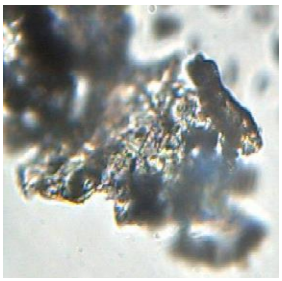
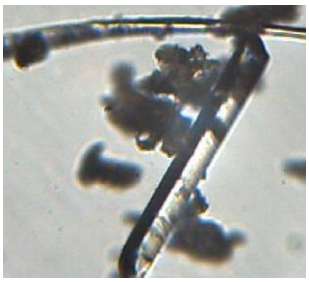
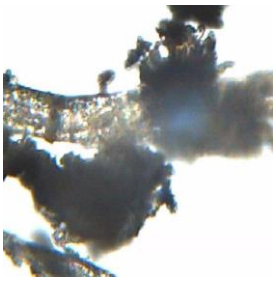
FMR **4–Step-Processing To Win Fine Metals**

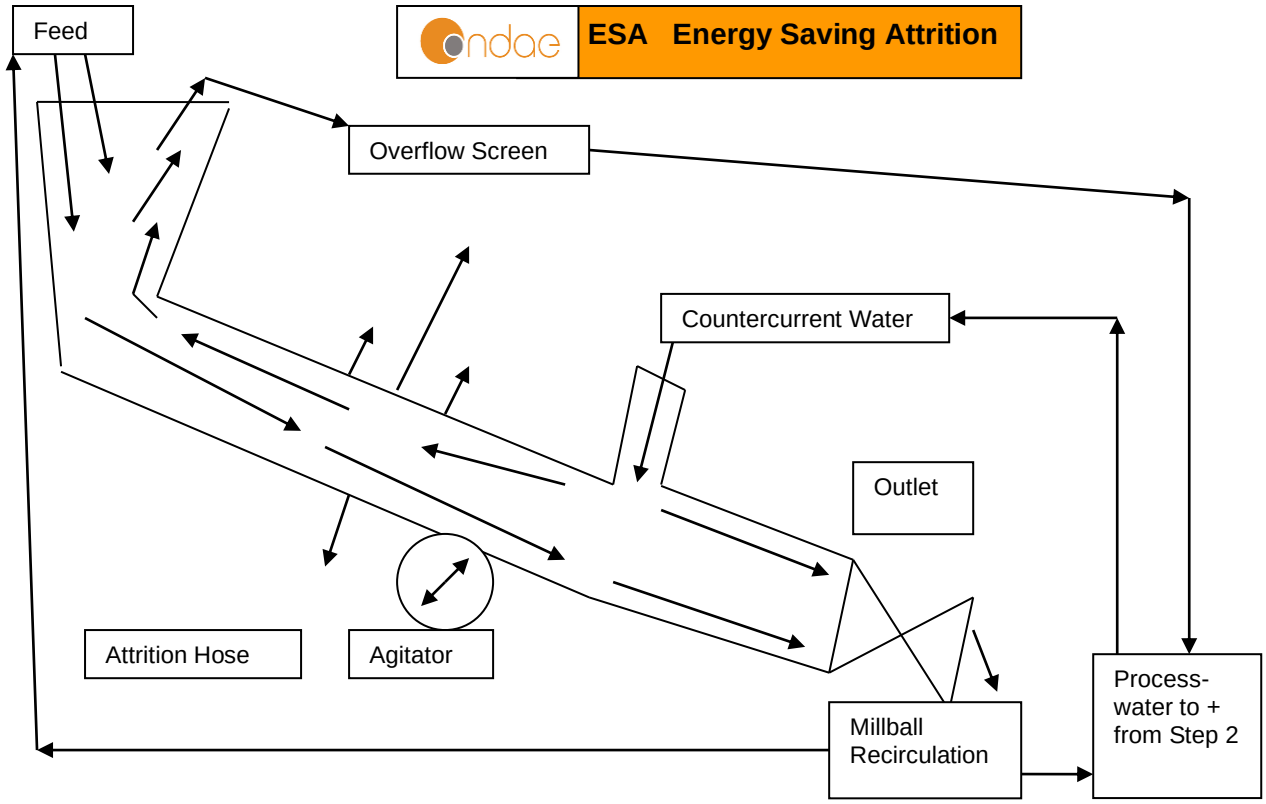
Microscope Photos of Lost Fine Metals

Situation:

As in ore and slag processing there are in several waste mixes, even also in filter dust, metals in different concentrations and grainsizes contained. Very often there are losses in the fines. Stockpiles of tailings are existing and waiting for a new processing technology to win the worthy elements economically. The reason for metal losses in the case of filterdust is a melting of plastic content by heat if there is a dry processing with fine particles. There for we make the last step of attrition in wet processing to avoid remelting by temperature influence.

Step 1: mbb-ESA

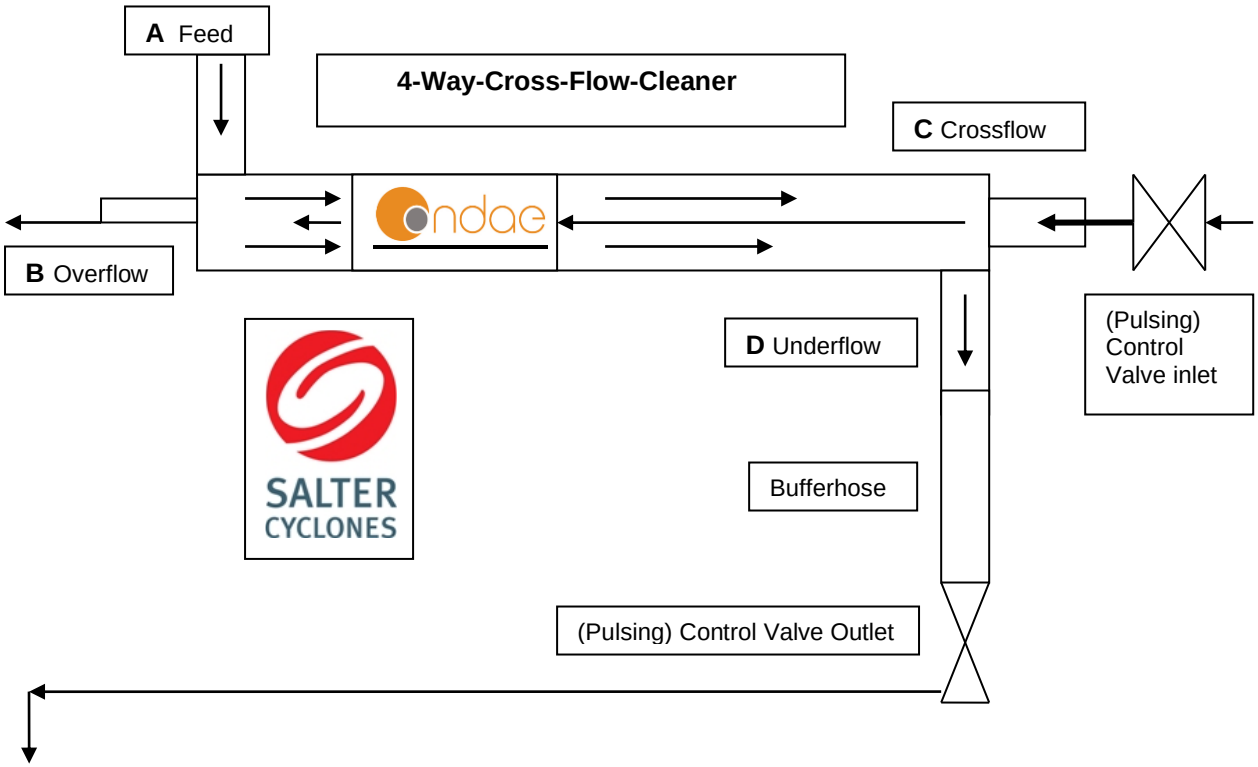
By wet milling in a Hosemill which mills, in some cases with using ore or slag instead of cylpebs, compounds are cracked and solved. After this step a separation by gravity will become possible by ESA (**E**nergy **S**aving **A**ttrition) instead of ballmills due to save cost in special energy and wear. The millballs will be recirculated and can be used from a recycling product. This processing is free of dust and free of wastewater. The wear of the millballs is used to get a heavy density liquid.



Step 2: mbb-Cross-Flow-Cleaner (4-Way-Hydrocyclone)

A Cross-Flow-Cleaner is a 4-Way-Hydrocyclone which has a second inlet in the middle of the vortex axis coming from below, and the underflow has a tangential outlet. The feed goes to inlet **A**, the overflow is **B**, underflow is **D** and Crossflow is **C** from **C** to **B** goes an adjustable countercurrent which can be optionally pulsed.

Lights, tailings and even fibres will be washed out to overflow **B** and this overflow will be treated in a second cyclone step in order to recirculate metal losses internally back to the process. In comparisation to the 3-Way-Hydrocyclones the mbb-Cross-Flow-Cleaner the volume split can be changed in current without stopping. The concentration of the underflow can be automatically controlled and also the heavy density. An anti-blockage-system is available.

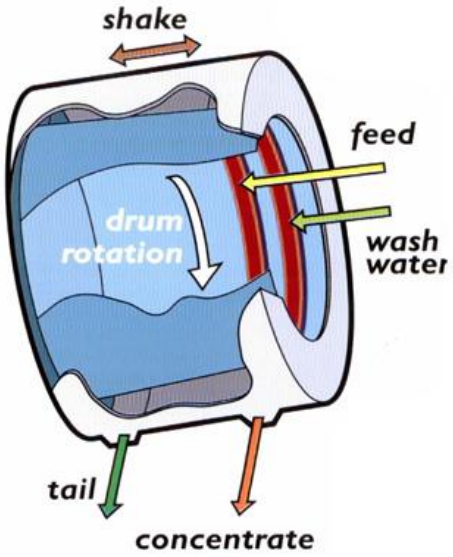

A Feed
4-Way-Cross-Flow-Cleaner
C Crossflow
B Overflow
(Pulsing) Control Valve inlet
D Underflow
Bufferhose
(Pulsing) Control Valve Outlet
SALTER CYCLONES

Step 3: MGS

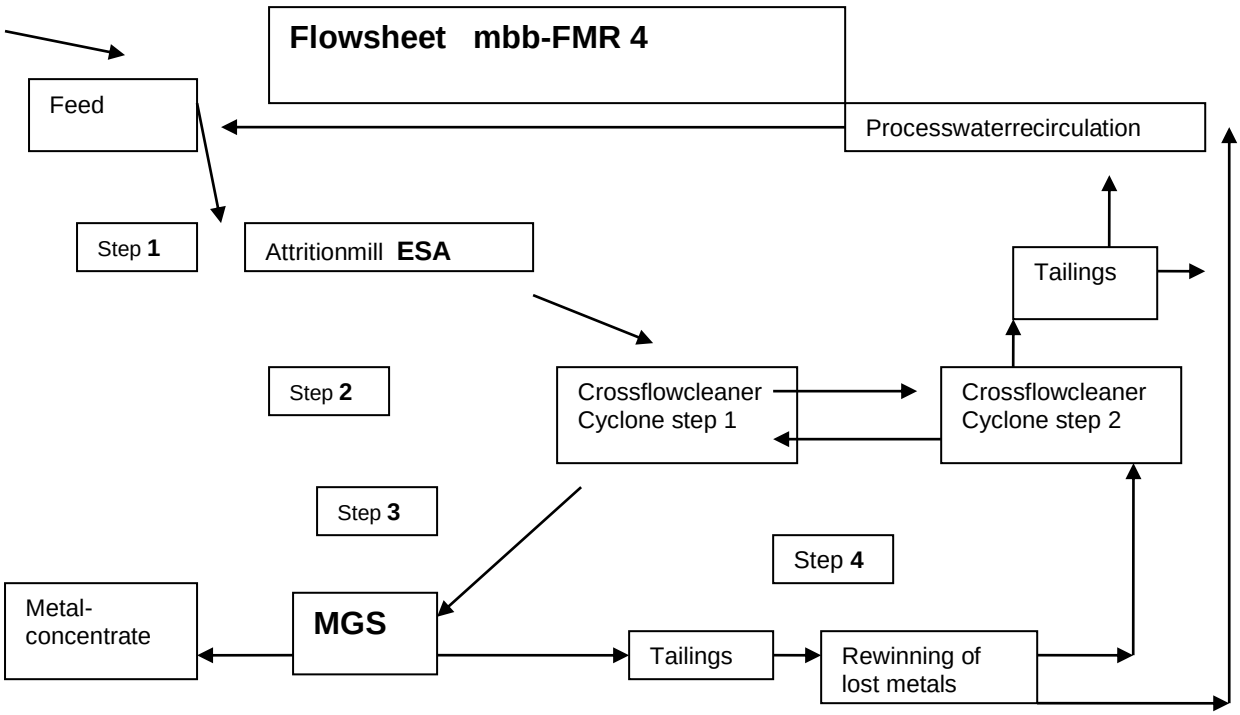
Upgrading a concentrate, which can be economically melted, by SCMG (Multi-Gravity-Separation) - it is a rotating shaking table. This technology had been sucessfully used in the field of international ore processing first by Richard Mozley.

SCMG1 Laboratory MGS

SCMG2 Full Scale MGS



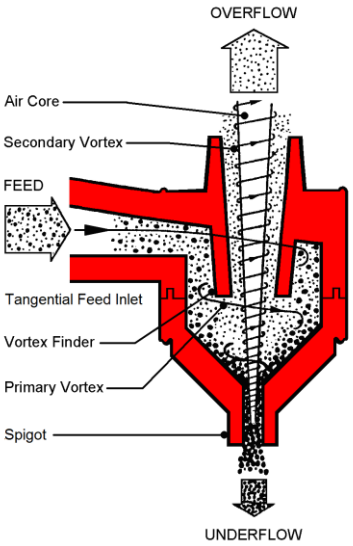
The rotation of the drum produces multiple gravity and by that the separation becomes more effective even ultra fine particles in the grain size from 5 – 80 µm and less gravity differences. Benefit of this processing is the small footprint in comparisation to shaking tables is a factor of 1 : 6 less space.



June 2018

Step 4: Recirculation Of Losses

By adjusting a MGS to get a high grade concentrate there is the option to rewin its losses in the 4th step by a hydrocyclone recirculation, so the effectivity will be better.



Princible of centrifugal Function

3-Way-Hydrocyclone

4-Way Cross-Flow-Cleaner

For further information and pricings please contact:

Ondae separation
Vertical Jigs and Hydrocyclones
Dipl.-Ing. Thomas Pfeuti
Bahnhofstr. 13e
D-25469 Halstenbek
mobil: +49-151-24047111
www.ondae-separation.de
info@ondae-separation.de

June 2018