High capacity Niagara XL-Class vibrating screens for Rare Earth Elements processing

Rare earth elements (REE) are increasingly in focus worldwide. Because of their special properties, they are used in electrical automobiles, renewable energies, high-tech-products and others.

There are 17 rare earth elements, which are divides into two groups according to their atomic number in the periodic table of the elements or according to their electron configuration. The light rare earth elements (LREE) include lanthanum, cerium, praseodymium, samarium and neodymium. The main representatives of heavy rare earth elements (HREE) are scandium, yttrium, gadolinium, dysprosium and terbium. [i]

Rare earth elements are widely distributed but its availability is limited because of the low concentration in many mineral ore deposits. [ii]
The content of the single REE varies widely depending on the mineral and the deposits.
On average more than 95 % of the REE deposits are the four light REE. The share for the 13 heavy REE Dysprosium, Erbium, Europium, Gadolinium, Holmium, Lutetium, Promethium, Samarium, Scandium, Terbium, Thulium, Ytterbium und Yttrium is approximately only 5%. [iii]

The outlook for REE is quite promising. This is particularly due to the growing demand for REE for electric vehicles, alternative power generation and many other modern technologies. Many exploration projects show the interest and the need for extraction of REE. Because of the REE- process routes there is always a need for modern and efficient processing equipment.

Haver & Boecker Niagara is a leading provider in screening, pelletizing and primary crushing systems. With deep roots and years of experience, we are using our innovative and shared technologies to effectively meet the needs of our customers from different industries around the world.

We at Haver & Boecker Niagara realized the increasing demand for rare earth elements and adapted our screening and pelletizing technology to process rare earths materials in the most sustainable way. Implementing our processing equipment in your rare earth operation, you are increasing your efficiency and are saving costs.

Our customer in Brazil in Goias State trusted our technology and installed eight vibrating screens of our model XL-CLASS ME 3050 x 6100 in his REE-processing plant. The Niagara XL-Class vibrating screen combines advanced exciter drive technology with a wide body for high capacity production.

Our screens were delivered with water spraying system, rubber cover to avoid spillage and slurry feed chute. The cut size is 1 mm and the throughput 210 t/h each screen.

The process works as follows (see flowsheet 1):

The screening system receives rare earth ROM with a top size of up to 100mm. Through conveyor belts the material is fed into the pulping chutes that have water spray nozzles. These chutes feed the material slurry to the HAVER screens, the classifying is done in 1.0 mm mesh and the screens also have spray nozzles to wash the material onto the deck. The oversize of the screen will be rejected from the process, while the undersize contains the slurry (ore + solution) where the final product will be obtained.

Together with our customer we evaluated the operation's needs and engineered a first-class, efficient screening solution.

Sounds interesting for you? Don't hesitate to contact us.

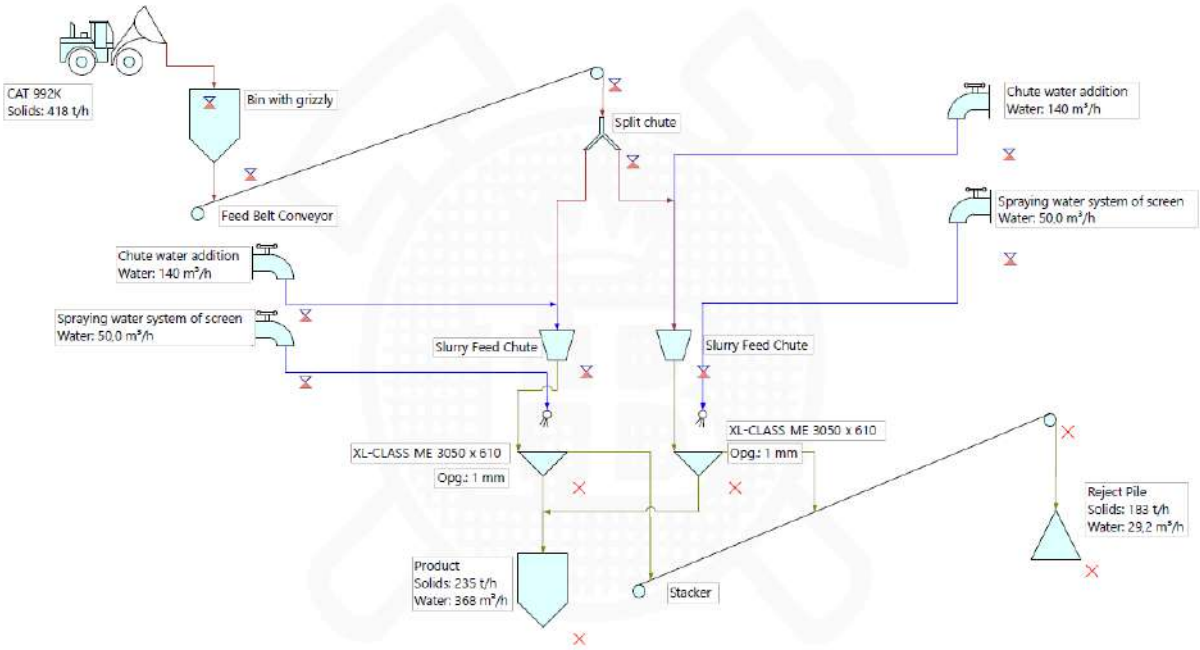

Figure 1: Flowsheet of the process

Figure 2: model XL-CLASS ME 3050 x 6100

Figure 3: model XL-CLASS ME 3050 x 6100

- Primary crushing plants
- Dry fine screening

i Technologiemetalle, Dr.-Ing. Joachim Harder, AT MINERAL PROCESSING 10/2018 (Volume 59)
ii https://institut-seltene-erden.de/seltene-erden-und-metalle/seltene-erden/
iii https://selteneerden.de/