

## **ThyssenKrupp Fördertechnik presents its latest generation of the world's largest screen**

It was already at the end of the 90s that a client from Northern Canada asked ThyssenKrupp Fördertechnik to develop special screens with very high throughput rates for economic oil sands processing.

The engineers at ThyssenKrupp Fördertechnik took up the challenge and designed the largest oil sand screen ever built for a feed rate of 10,000 t/h and with a screen size of 4 m x 10.5 m.

These screens incorporate 6 ThyssenKrupp size IV exciters and have a vibrating weight as high as 75 t with the isolation frame to be added.

As these huge machines have been working very satisfactorily all over the world since 1999, ThyssenKrupp Fördertechnik has further developed these screens for its client Canadian Natural Resources Limited for the processing of oil sand.

The screen type DU 64-3.6 x 8.0 (8.9) ED displayed at Bauma 2007 is a model of the latest generation which was designed for extremely difficult-to-screen materials.

The screen deck has two steps causing the material bed to break up. This way, the fines can be screened off more quickly and the screen efficiency is considerably increased compared with that of traditional screens. In order to loosen up the material being turned at the steps even further, it is sprayed with water. The feed capacity of these state-of-the-art machines is 6,000 - 8,000 t/h of oil sand with a bitumen content of 18 % and a feed size of 0-600/900 mm.

By adding approx. 3,000 m<sup>3</sup>/h of hot water (95 °C) a closed material bed with an effective weight of approx. 10 t is formed on the screen deck, especially when exposed to the low winter temperatures of -45 °C.

This material bed is broken up by 6 ThyssenKrupp size IV exciters, each generating a centrifugal force of 56 t. A 200 kW motor drives two rows of size IV exciters - three in each row - through a synchronised gear box reducer. Synchronisation of the two exciter rows allows the amplitude between the feed and the discharge side to be adjusted, so that in case of, for example, seasonal material build-up a higher conveying speed and break up of the material bed in the feed area can be realized.

To respond to changing material characteristics a frequency converter is provided which ensures that the required operating speed and a constantly good screening efficiency are attained.

Extreme temperatures ranging from -50 °C in winter to +35 °C in summer as well as the addition of hot water (liquor) make high demands on the advanced materials, which must be exceptionally elastic to withstand the high dynamic loads.

In order to meet the stringent quality requirements for materials, welding technology and machining, the screens have been and still are manufactured in Germany only. Normally, the screens are installed in steel structure buildings - in this case at a height of 20 m. They incorporate isolation frames to minimize the dynamic foundation loads passed to the supporting structure of the screen.

Design calculations were carried out with the aid of finite element analysis. Since the latest generation has proved its readiness for series production, comprehensive vibration and strain measurements are being performed on a routine basis during the test run at the workshop for verification of the design calculations.

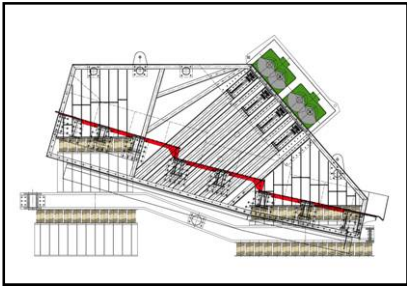


Bild 1: Schematische Darstellung der neuen Siebgeneration  
*Fig. 1: Schematic illustration of the latest screen generation*



Bild 2: Das zweistufige Siebdeck der neuen Siebgeneration  
*Fig. 2: Two-step screen deck of the latest screen generation*



Bild 3: Eines der neuen Siebe kurz vor der Verschiffung  
*Fig. 3: New screen waiting to be shipped*