

was integrated for sustainable sand regeneration. Since then, roughly 5 million castings have been produced there annually, which have to be freed from foundry sand following casting. The vibration-related systems and components required for this were supplied by Cyrus GmbH Schwingtechnik.

The following requirements had to be factored in when developing the sand processing system.

- > Maximum system availability
- > Maintenance-friendly access to all components
- > Process-safe sand handling
- > Automatic foreign body removal
- > Professional project management

Vibration conveying technology made by Cyrus

In the core-making facility, cores recognised as being defective are separated and taken for sand processing through a shake-out grid and downstream vibration conveyor. The shake-out grid is subjected to vertical vibration movements through unbalanced motors and crushes the sand cores down to a maximum size of 200 x 200 mm. The sand is then taken to the main conveyor lines through the chute distributor (Image 3). Here the sand which has already been separated following the casting process and the defective cores pre-crushed in the shake-out grid are brought together. The sand, which is still hot, is fed to three vibrating conveyors with a total length of around 140 m and a core sand circulation volume of 12 t/h. With an output of 7 t/h in each case, the conveyed material is pulverised to grain size, and any metals, slag residue and other foreign bodies still present are automatically removed. Any impurities still adhering are removed in the subsequent linearly vibrating screen. A stationary 'control screen'

Fig. 1: Overview of the entire system

monitors the maximum permitted grain size of < 3 mm. This ensures that no larger particles can reach the processing stage through the sand conveyor and damage the system. After going through the system, the supplied material obtains 'new sand' quality.

The overall design included a comprehensive testing phase of the components, including measurement of the vibration data, prior to installation and commissioning.

Competence confirmed: effective project and installation plans

The highest level of failure safety was a key criterion for the BMW group when designing the sand processing system, resulting in the decision for a redundant arrangement with two parallel conveyor lines. The vibration conveying technology permanently demonstrates operational reliability in operation; meaning redundancy is therefore not required. The systems now run in regular alternation and have a considerably longer service life

due to the parallel use, whilst also featuring reliability simultaneously.

The secure availability of the entire system is the result of the technical and efficient design from Cyrus. This is usually developed individually, from scratch for each customer, because each customer places different requirements on a regeneration system. "Every sand processing system has its own requirements and needs different concepts which are analysed, planned and implemented with the highest levels of accuracy by Cyrus as a supplier of vibration conveying technology all the way through to complete systems. In addition to professional engineering, objectives are always selecting ideal components for the product-friendly conveying of sensitive castings, a high degree of operational safety and low-maintenance operation of the system", summarises Sven Borghoff, Head of Sales and Marketing at Cyrus.

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Image 2 (left):

Resonance channel as a main conveyor line in the tunnel.

Image 3 (right):

Chute distributor at the transfer point to the two main conveyor lines.