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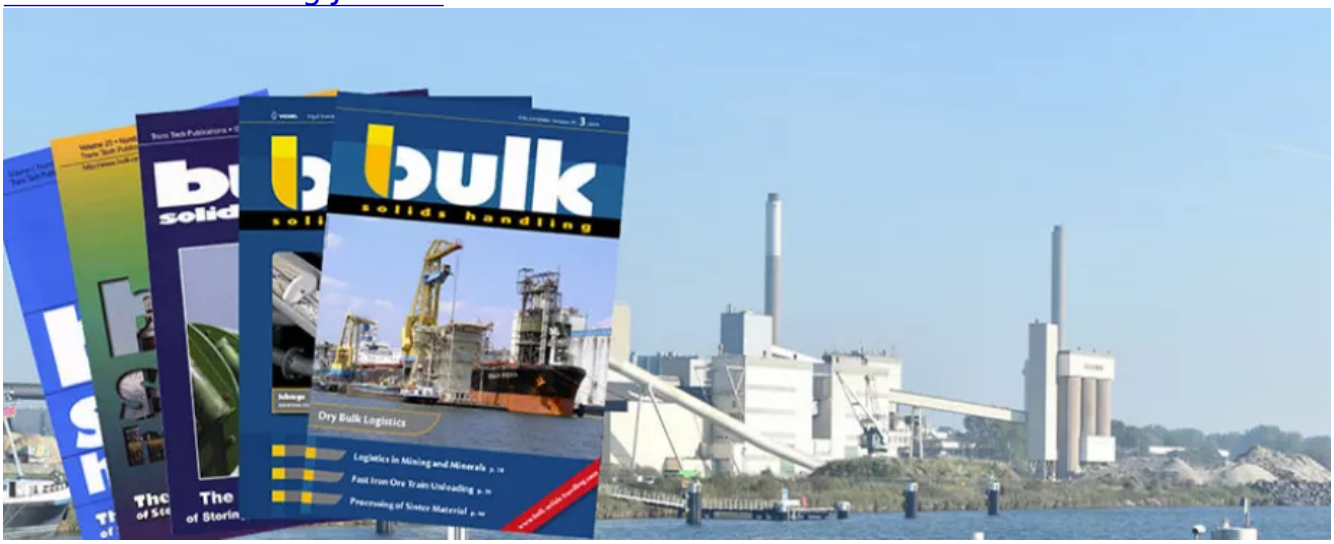

Technical Article

Tests on a Very Large Shear Cell

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The design of storage bunkers requires data on the flow properties of the granular material being stored. Such data is usually gathered using a shear cell of which there are many designs. The Jenike Flow Factor Tester has become almost standard over recent years but the annular cell has the advantage of unlimited travel, ensuring that the material can be put into the critical state.

Most shear cells have an upper limit of particle size which can be handled in the cell, eight mesh being the upper limit for the Jenike cell. To gain information on the flow properties of materials which have large particles (say 50 mm) a large annular shear cell has been constructed, of average trough diameter 1020 mm, trough width 100 mm.

The Portishead annular shear cell (average diameter 250 mm, trough width 25 mm) is a device very similar to the large cell and the author was able to carry out a series of comparative tests using the same material in each. The large annular cell gave much higher strength values and the author speculates that a Janssen effect may be resulting from the difference in trough sizes.

The fact that the design of the two annular cells differed a little does not remove the concern over the differing strength values for there are important serious implications on the validity of the shear test methods in general. Mention is made of a previous work which showed poor agreement between a Portishead cell and a

Jenike cell and in one case revealed cyclic behaviour in the annular cell.