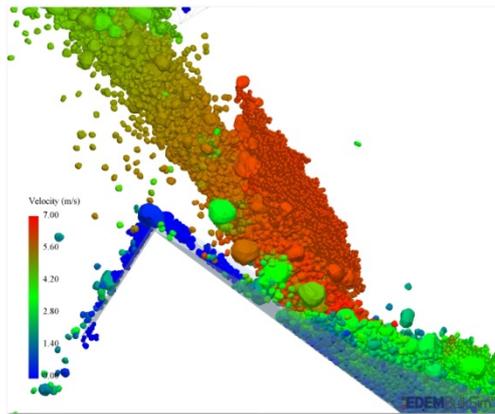
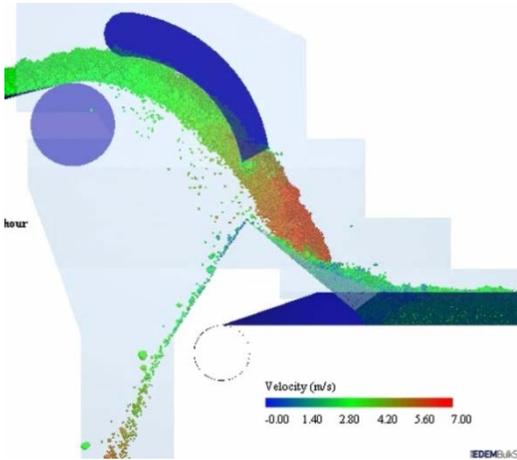


Hatch Deploys EDEM BulkSim Solution for Mining



Hatch Ltd. is a global supplier of engineering, project and construction management services to the Mining, Metallurgical, Energy, and Infrastructure sectors.

Hatch deploys EDEM BulkSim to explore “what-if” scenarios, while performance testing and verifying complex conveyor transfer point designs.

<http://www.hatch.ca>



Challenge

Hatch was contracted to upgrade the conveyor transfer point at an existing coal preparation plant. Hatch’s client required upgrades to accommodate a scheduled increase in production.

The conveyor carried coarse product coal, topped by a layer of filter cake with a high moisture content. The existing chute was prone to material build-up of this “sticky” filter cake, often plugging during surges in flow rate and causing costly downtime.

Although a relatively small conveyor, at 1,200 t/h, it was critical to ensuring constant product throughput to truck-loading bins.

Hatch deployed EDEM BulkSim to design and validate a new transfer point for use under various operating scenarios and levels of filter cake moisture.

Solution

The redesign of the transfer chute was accomplished using the EDEM BulkSim Solution, including Material Testing and DEM Material Model Calibration services.

Dynamic flow testing was performed on actual samples of the product coal and filter cake that were representative of actual materials on site. DEM Material Models were quickly calibrated by comparison of physical test results with simulations, using automated parameter sweeps on a cloud computing platform.

Hatch’s new transfer point design included a flop gate, hinged at the top, to direct flow onto one of two flow paths.

Virtual performance testing of design options was performed under a range of material flow conditions and included highly cohesive materials. This enabled Hatch to quickly select the optimal configuration for production of the detailed design.

Benefits

EDEM BulkSim simulation showed that the proposed new transfer point design would provide increased throughput and perform better than expected when dealing with highly cohesive materials and at surge in-flow rates.

Hatch was able to verify the performance of the transfer point before fabrication, and simulations showed low wear rates on the receiving chute.

The use of **calibrated DEM Material Models** provided Hatch with accurate, fit-for-purpose DEM simulations, resulting in a re-design with substantial benefits in **equipment reliability** during plant start-up and commissioning, and further benefits of **increased plant quality, yield and performance for the client**.

The EDEM BulkSim Solution provides design validation for an upgraded conveyor transfer point handling sticky materials

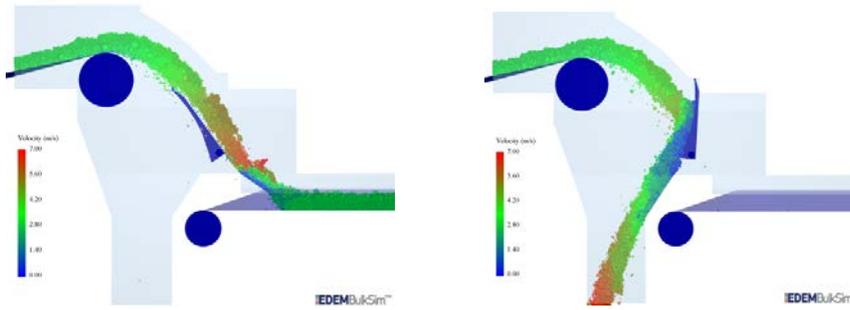
“Over the past several years Hatch has been integrating EDEM simulation technology and services into design projects and has achieved a high level of confidence in materials handling equipment designs.

This results in substantial benefits around design robustness, equipment reliability in plant start-up and commissioning, and increasing plant quality, yield and performance...”

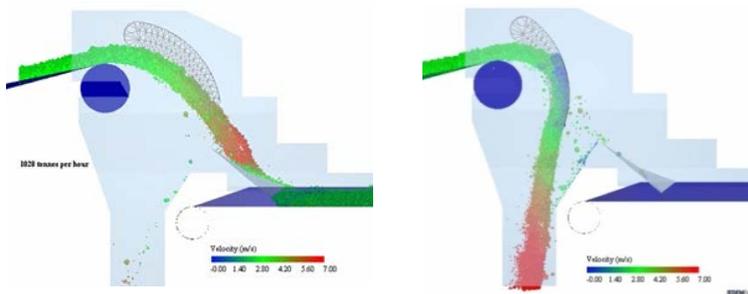
Dr. Brian Moore, Lead Engineer, Bulk Materials Handling, South East Australian Hub, Hatch



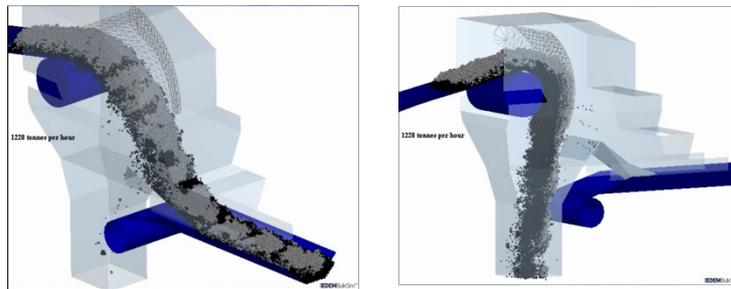
Key Information



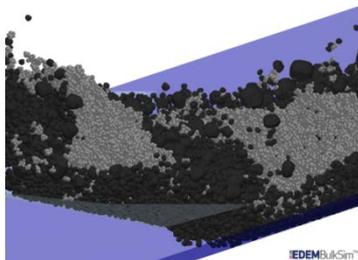
Previous transfer point, shown with flopp gate lowered (left) and raised (right), was prone to build-up and blockage. Material colored by velocity (blue shows slower-moving material). Hatch was contracted to redesign the transfer point to handle a planned increase in throughput.



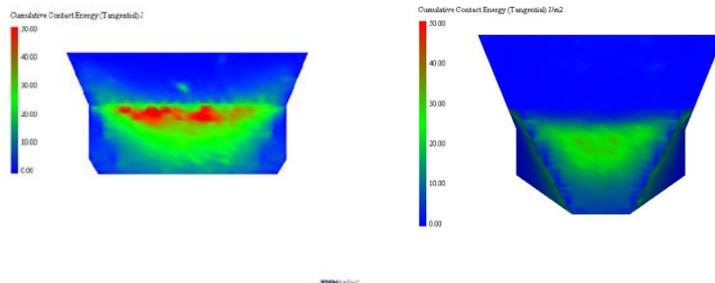
New transfer point design, showing flopp gate raised (left) and lowered (right). EDEM BulkSim simulation shows material flow for the proposed new design, running at design rate (1,200t/h), with slower-moving material colored blue.



EDEM BulkSim simulation of material flow for the new design, running at surge in-flow rate (1,228t/h). Reliable flow is maintained with flopp gate in raised (left) and lowered (right) positions.



Close-up view showing clumping of highly cohesive filter cake discharging to receiving conveyor belt.



EDEM BulkSim image shows areas likely to experience relative wear on the load chute for the updated configuration (right) and original configuration (left). (Red indicates high relative wear.) Analysis indicates the updated configuration will experience lower wear rates.