



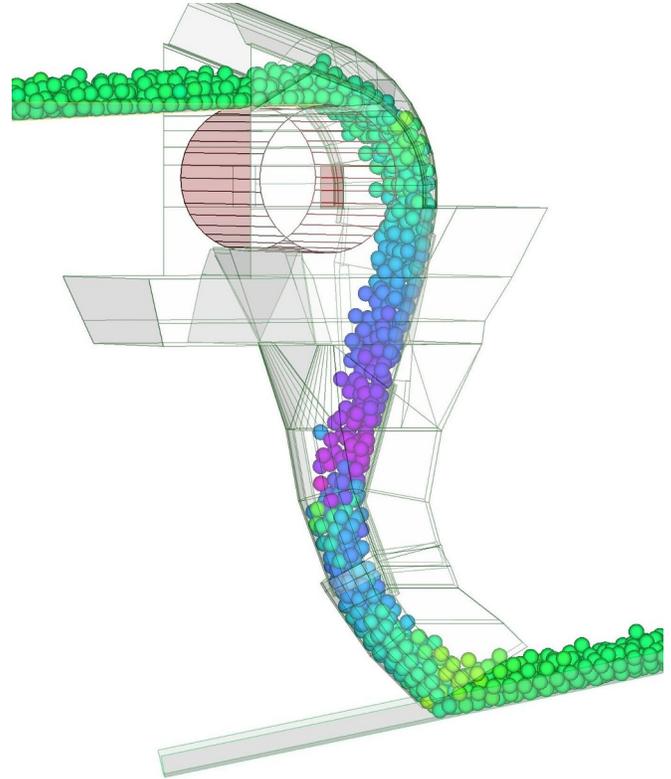
## Smart Chute<sup>®</sup> Transfer Design Discrete Element Modeling (DEM)

Advances in computer technology have made it possible to apply complex mathematical computations, computer simulation and three-dimensional visualization to transfer chute design. The result: applying science to chute and loading systems design.

Using this method, known as Discrete Element Modeling (DEM), CCC Group, Inc. Engineering & Design Division is equipped to provide advanced design and analysis of bulk material transfer systems. The objectives are to: optimize the flow of material; minimize abrasive wear to conveyor belts, chutes and other system components; and greatly reduce material degradation and dust. Additionally, DEM design contributes can generate a considerable cost savings by ensuring the design is right the first time, prior to system fabrication and construction.

The DEM explicitly models the dynamic motion and mechanical interactions of each particle in the physical system throughout a simulation and provides a detailed description of the positions, velocities and forces acting on each particle at discrete points in time. The particles interact with chute surfaces, other particles and the conveyor belts.

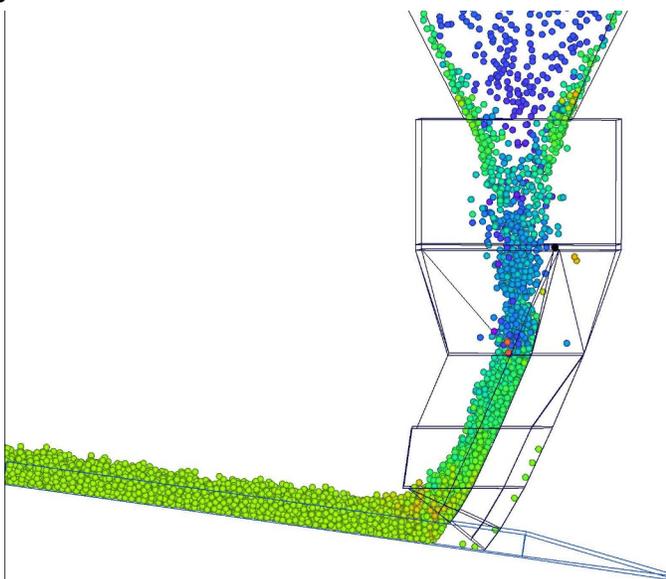
By watching these interactions, the behavior of the material can be understood and, perhaps most importantly, 3-D visualizations of the simulation provide the designer an overall "feel" for the material behavior. Flow problems are accurately predicted in existing installations, and the most efficient design can be achieved for modernizing a system, or designing a new one.



In summary, Discrete Element Modeling, when applied to a material handling system by CCC Group, Inc. Engineering & Design Division, yields these benefits for bulk material handling system plant executives and other stakeholders:

- Less induced air
- Less turbulence in load zone
- Less particle degradation
- Less differential between material speed and belt speed
- Less dust
- Less belt wear
- Less chute wear

To learn more about achieving a clean plant through Discrete Element Modeling design, contact CCC Group, Inc. Engineering & Design Division or visit us at [www.cccgroupinc.com](http://www.cccgroupinc.com).



**DEDICATED TO DUST CONTROL & MATERIAL TRANSFER TECHNOLOGIES**