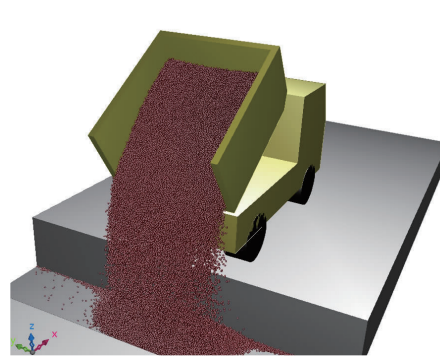


## Example of Coupling with DEM

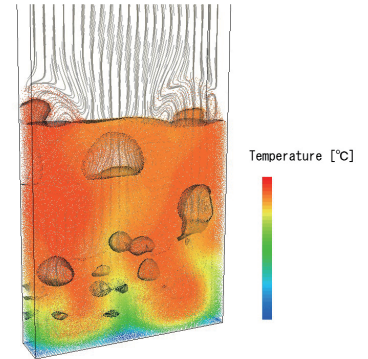
Coupling with meshfree Lagrangean method

### What is DEM?

- DEM (Discrete Element Method) is a kind of a particle-based method to track individual calculation points, classified as a meshfree Lagrangian method in terms of solution method.
- Captures the behavior of individual particles difficult to predict enough by FVM (finite volume method) which requires mesh generation.
- Suitable for modeling phenomena including particle accumulation, filter choking, and heat transfer between particles since it involves identifying the contact force between particles.
- Strong coupling analysis of DEM-FVM available in both scSTREAM and scFLOW.



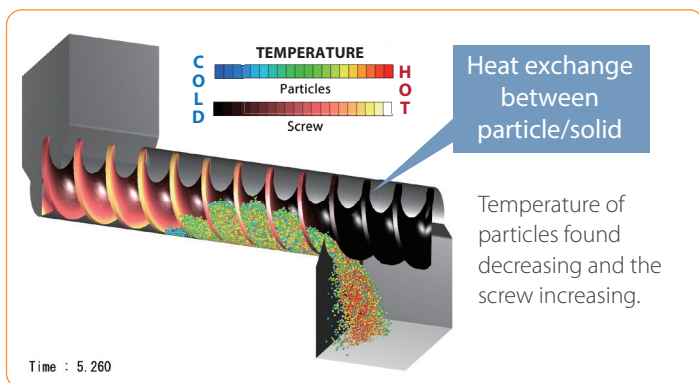
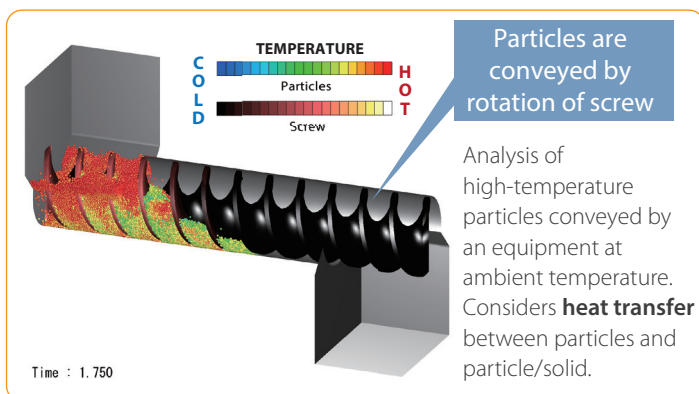
Sand and gravel transportation



Fluidized bed

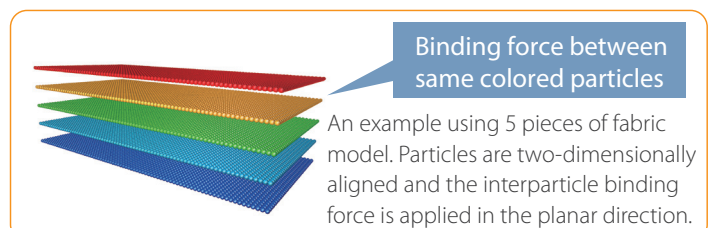
### Screw Conveyor

Calculates the agitation and transportation of particles with a combinational use of **Moving Objects**. Particles are conveyed by the rotation of a helical screw.

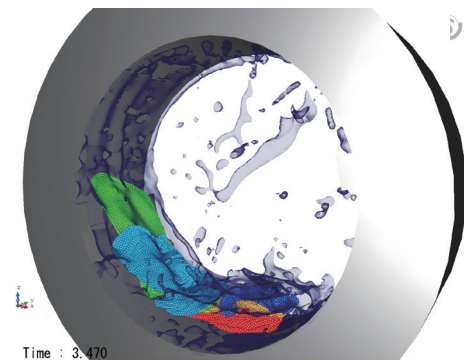


### Washing Machine

Builds a DEM-Fabric Model which moves while maintaining two-dimensional connection like a cloth by defining the binding force between particles.



Analysis of cloth and fluid rotating in a horizontal drum. The gas-liquid interface is calculated by **VOF (Volume of Fluid) Function**, and the cloth is represented by a DEM-Fabric Model.



A complex phenomena involving three phases flow (liquid-gas-cloth) can be analyzed.

### Notes

- Strong coupling of DEM-FVM solution delivered by scSTREAM and scFLOW shows its capability to accurately capture the behavior of the interaction between flow and particles to fit to the user's area of focus.
- DEM can be used in combination with moving elements (Moving object), heat transfer and free surface all of which are standard features applicable to a wide range of engineering projects. The use of Scripts (User-defined functions) will further expand the applications field.