Altair® EDEM™
Discrete Element Method (DEM) Software

EDEM Creator

EDEM Simulator

EDEM Analyst

Altair® EDEM™ is the market-leading software for bulk and granular material simulation. Powered by state-of-the-art Discrete Element Modeling (DEM) technology, EDEM quickly and accurately simulates and analyzes the behavior of coal, mined ores, soils, fibers, grains, tablets, and powders.
EDEM simulation provides engineers with crucial insight into how bulk materials will interact with their equipment during a range of operation and process conditions.

Product Highlights:

- Bulk and granular material flow simulation software based on Discrete Element Method (DEM)
- Over 60,000 of Material Models available
- CPU, GPU and multi-GPU solvers
- Couple with Finite Element Analysis (FEA) Multi-body Dynamics (MBD) and Computational Fluid Dynamics (CFD).
- Customization using EDEM API

Benefits

Simulate any material:
Comprehensive range of validated physics models available: simulate any material type and shape: large lumps, dry, fine, sticky, cohesive, flexible

Easy workflow:
Intuitive user interface for quick simulation set-up and

High performance:
Fast and scalable compute performance across CPU, GPU and multi-GPU solvers – simulate large and complex particle systemsadvanced visualization and analysis

Material models available:
Instant access to a library of thousands of pre-calibrated material models representing rocks and ores. Set of material models with advanced physics available for soils and powders.

Advanced customization:
Custom physics with EDEM's highly versatile Applications Programming Interface for complex simulations and advanced material behavior: sticky solids, breakage, flexible fibers & more.

CAE INTEGRATION:
Couple with Finite Element Analysis (FEA) Multi-body Dynamics (MBD) and Computational Fluid Dynamics (CFD).

EDEM components
EDEM software is made of 3 core components: EDEM Creator, Simulator and Analyst.

EDEM Creator
EDEM Creator is the pre-processor for setting up an EDEM simulation model.
- Setup simulations in a fast, logical manner with EDEM's intuitive and user friendly interface
- Import equipment geometry from a wide range of CAD files (IGES, STL, STEP and more)
- Assign equipment motion (linear, rotational, sinusoidal and more)
- Model real world particle shapes using the validated and highly versatile multi-sphere method
- Select contact physics models, define
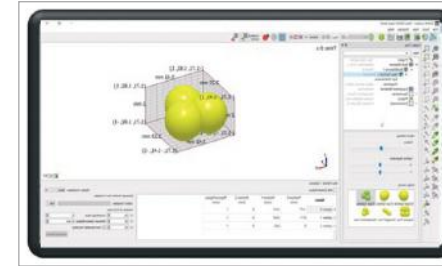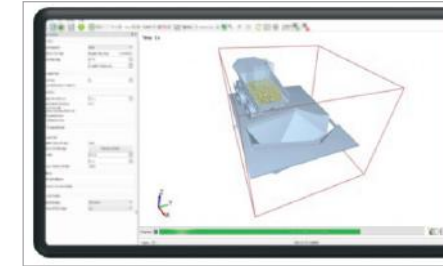
material properties or add a material model straight from our extensive libraries.

EDEM Simulator
EDEM Simulator is a powerful solver for fast and efficient simulations.
- Cutting edge DEM solver, highly parallelized for use on multi-core shared memory workstations, GPU hardware and multi-GPU systems
- Solver engine is fully double precision across all platforms
- Simulate large and complex particle systems
- Live viewer window to easily review progress and assess design performance
- Start and stop simulations at any time or configure on-the-fly data output

EDEM Analyst
EDEM Analyst is the post-processing environment where simulations are reviewed and analyzed.
- Advanced and powerful post-processing capability
- Extensive set of tools for visualization and analysis (coloring, graphing, bin groups)
- Create high resolution images and videos
- Data mining: option to export all simulation results data in .csv format as well as an EnSight file for advanced visualization
- Access EDEMpy: a Python library for post-processing and analyzing simulation data

CAE integration
EDEM has the interfaces and functionality to couple with all of the major CAE technologies such as finite element analysis (FEA), multi-body dynamics (MBD) and computational fluid dynamics (CFD).

Bringing EDEM into play with other CAE tools enhances the insights and design capabilities of these tools and enables a more integrated and seamless multi-physics simulation capability for engineering design and analysis.

EDEM and Finite Element Analysis
Using EDEM in combination with Finite Element Analysis (FEA) provides manufacturers of bulk materials handling equipment – such as bucket loaders, transfer chutes, and truck bodies – with valuable additional insight as to how their equipment will perform during operation. EDEM provides design engineers with an accurate representation of the pressure and forces acting on equipment as a result of a bulk material. By transferring this realistic material data to their FEA software, engineers no longer need to rely on hand calculations or approximation during the design cycle and can have confidence that a proposed design will meet requirements.

EDEM and Multi-body Dynamics
Coupling EDEM with Multi-body Dynamics (MBD) software allows manufacturers of heavy equipment to gain better insight into machine-material interaction. EDEM-

MBD co-simulation provides the capability to model and visualize dynamics of equipment movement and examine how loads exerted by bulk materials are distributed throughout the mechanical system.

The EDEM Coupling Interface enables coupling of EDEM with 3rd party MBD simulation software, as well as implementation of user-defined kinematics and rigid body dynamics models within the EDEM simulation environment.

EDEM and Computational Fluid Dynamics
Particle-fluid systems such as fluidized beds, solid-liquid mixing, spray coating, can be investigated by coupling EDEM with Computational fluid dynamics (CFD) software.

The EDEM Coupling Interface provides a means of coupling EDEM with CFD solvers for 1-way and 2-way coupled simulations.

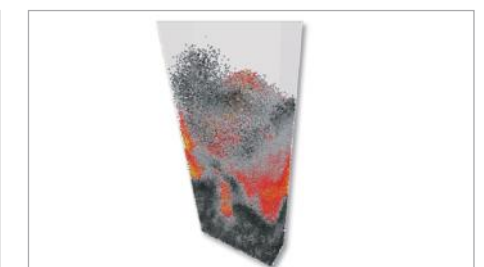EDEM is used globally in all industries that handle or process bulk and granular materials:
- Construction and Mining Equipment
- Agricultural Machinery
- Off-road Vehicles
- Mining and Mineral Processing
- Steelmaking
- Pharmaceuticals, Food, and Chemicals

EDEM and Finite Element Analysis

EDEM and Multi-body Dynamics

EDEM and Computational Fluid Dynamics