

Multiphase flow simulator

iGRAF on SOLIDWORKS

powered by KOZO KEIKAKU ENGINEERING Inc.

*Who says engineers cannot realize their dream?
Nobody will doubt your talents if you can perfectly use iGRAF.*

Integrated Granular Flow Simulation Software (iGRAF) was developed to compute granular flow, gas-solid flow, solid-liquid flow, gas-liquid flow and gas-solid-liquid flow in various industries. The physics models were selected by Dr. Mikio Sakai, a world-leading Professor on discrete element modeling.

Twin screw kneader

iGRAF contains the following innovative technologies.

- State-of-the-art multi-physics models
- Multi-thread parallel computation technique
- Implementation of a computation without complex mesh generation procedure

Ball mill



Die filling



Spouted bed

iGRAF Package

iGRAF-EL (Euler-Lagrange)

Gas-solid-liquid flow simulation

Standard functions

- 3D gas-solid flow, 3D solid-liquid flow
- Granular flow (poly-dispersed system)
- Single phase fluid flow (FVM, Laminar flow)
- Immersed boundary wall modeling (CFD function)

VOF option

- 3D gas-solid-liquid flow
- 3D gas-liquid flow (Laminar flow)
- Free surface fluid flow (VOF)

iGRAF-LL (Lagrange-Lagrange)

Solid-liquid flow simulation with MPS

- 3D solid-liquid flow
- Granular flow
- Single phase fluid flow (MPS, Laminar flow)
- 3D heat flow (Heat flux analysis is available)
- Explicit MPS method
- “iGRAF-LL will be introduced in a future version.”

Common functions

- CAD Import function
- Coarse grained model for large-scale DEM simulation
- Arbitrary shaped boundary wall modeling (DEM function)
- Multi-thread parallel computation technique

System Requirements

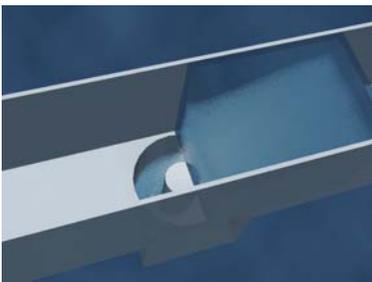
- OS : Windows 7 (64bit) / Windows 10 (64bit)
- CAD : SOLIDWORKS (Version2015 or later) is required.

Applications

Single Phase

Granular flow

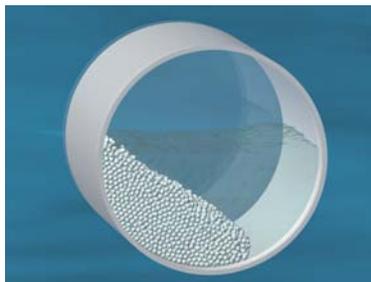
Example : screw conveying, die filling, storage, mixer



Two Phase

Gas-solid, solid-liquid, gas-liquid flow

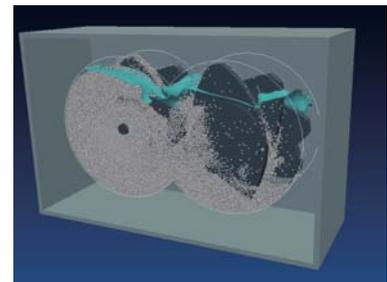
Example : fluidized bed, pneumatic conveying, wet ball mill, beads mill, twin screw kneader



Three Phase

Gas-solid-liquid flow

Example : wet ball mill, solid liquid mixer, slurry transport



Consulting

- Consulting service including validation of the simulation results through experiment
- Expertise on how to acquire the physical properties value
- Customize iGRAF solver based on your requests