April 12, 2017

KKE launches iGRAF, SOLIDWORKS Add-in Granular and Multiphase Flow Simulation Software, Starting from Japan

- For more designers to use solid (powder)-liquid-gas flow simulation -

Kozo Keikaku Engineering, Inc. (Head Office: Nakano-ku, Tokyo, President & CEO: Shota Hattori, "KKE" hereafter) begins its sales and service for a new Integrated <u>Granular Flow</u> Simulation Software "iGRAF" to the Japanese market.

iGRAF* is a granular and multiphase flow simulation software developed by KKE and is the world's one and only add-in granular simulation software for SOLIDWORKS, the most popular 3D CAD software in the manufacturing industry. iGRAF enables designers without any special simulation knowledge to easily perform granular and multiphase flow simulations. Conventionally, it was difficult to simulate the granular flows of machines with complicated shapes. Even with supercomputers, it takes a lot of time and effort to simulate the three-phase flows of powders, liquids, and gasses. iGRAF, however, will make these simulations possible at your desk.

KKE has independently developed this software by adopting the physical model proposed by Associate Professor Mikio Sakai, who is making notable research progress in the field of powder and multiphase flow simulation at the University of Tokyo's Resilience Engineering Research Center.

iGRAF will help solve issues in designing and improving manufacturing machines, as well as enhancing manufacturing processes such as stir (agitation), mixture (blend), filling, and conveyance that are essential in food, chemical, pharmaceutical, steel, building material, metal, and other such industries.

KKE plans to market iGRAF worldwide by making the software available in English from the late summer of 2017.

KKE has a long history of introducing innovative computer solutions for the structural design of buildings, and with its accumulated technology and expertise in both hardware and software, the company has been providing CAE software for multiple product designs in the manufacturing field for over twenty-five years. Based on our accumulated expertise, it is our aim to contribute to society by using the physical model proposed by Associate Professor Sakai and developing a simulation software which is easier for more designers to use.

As a professional design and engineering firm that acts as a bridge between the academic and business worlds, KKE strives to solve the various issues and challenges that society faces in diverse fields, utilizing engineering expertise acquired through knowledge exchanges. KKE will thus contribute to creating a wiser and better society.

See more information on iGRAF at the link below

http://www.kke.co.jp/en/solution/theme/manufacturing/igraf.html





Features

> A Simple and Friendly User Interface

iGRAF runs on SOLIDWORKS, which makes the steps for setting simulation conditions simple. Designers who are using SOLIDWORKS, but have little experience with granular simulation, can smoothly perform advanced granular and multiphase flow simulations with iGRAF.



- > No Need to Generate Meshes: The Unique Shape Recognition Algorithms
 - 1. Modeling wall for powders

iGRAF is embedded with a unique algorithm, **Signed Distance Function (SDF)** in modeling the wall for powders. With SDF, the system is able to recognize complicated shapes without the use of meshes, thus avoiding the trouble that comes with generating mesh.

2. Modeling wall for fluids

Immersed Boundary Method (IBM) has been adopted for modeling the wall for fluids. There is no need to specify the mesh size or shape with IBM, which reduces the time for users to generate mesh. For example, it is possible to simulate translational and rotational movement, vibration, and even a combination of these movements in a fluid.

> A Large-Scale Simulation at One Workstation

iGRAF is integrated with a DEM Coarse Grained Model that replaces groups of small powders with large powders, along with a multi-core parallel calculation technology for powder and fluid. These technologies make it possible to simulate 100 million particles using only one workstation.

Simulation Examples





Fluidized Bed

This is a simulation of a fluidized bed, pumping air upwards through the powder. Fluidized beds are used in devices such as incinerators and drying equipment.

• Watch the simulation at

www.sbd.jp/product/igraf_fluidizedbed.shtml

Twin-Screw Kneader

This is a simulation of mixing liquid and powder together with a twin-screw kneader. Twin-screw kneaders are used for mixing or kneading, such as with lithium-ion battery materials.

• Watch the simulation at

www.sbd.jp/product/igraf_twinscrewkneader.shtml

For Further Information on iGRAF

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Product Information

Software

"iGRAF" - SOLIDWORKS add-in Granular and Multiphase flow Simulation Software

- Service
 Software Licensing and Distribution (annual license)
 Contract Analysis / Consulting
- Operating Environment
 OS: Windows7 64bit
 SOLIDWORKS: Version 2016

Exhibitions

The 12th Powder Technology Exhibition Osaka

Date October 11 (Wed) - 13 (Fri), 2017

Venue International Exhibition Center, Osaka

Registration 1000 yen (Free of charge for students, online pre-registrants, and attendees with invitation tickets)

For more details visit http://www.powtex.com/osaka/english/

About KKE (http://www.kke.co.jp)

KKE actively pursues its *Thought* (motto) "Innovating for a Wise Future", a future vision and direction to be sought together with society. As a Professional Design & Engineering Firm that acts as a bridge between the academic and business worlds, KKE strives to solve various issues and challenges that society faces in diverse fields, utilizing its engineering expertise acquired through knowledge exchanges. KKE will thus contribute to creating a wiser and better society.

*1: iGRAF is a registered trademark of Kozo Keikaku Engineering Inc. The proper nouns of company names and product names, etc., are the trademarks or registered trademarks of their respective owners.