



Particles and flow processes are everywhere in industry, environment and everyday life

Our Computer Aided Engineering solutions can model and optimize your industrial or environmental flow process. This results in improved process performance, enhanced throughput, reduced emissions and downtime.



$$t_{contact,H} = 2.87 \left(\frac{m^{*2}}{r^* E^{*2} v_{rel}} \right)^{1/5},$$

$$m^* = \left(\frac{1}{m_1} + \frac{1}{m_2} \right)^{-1}, r^* = \left(\frac{1}{r_1} + \frac{1}{r_2} \right)^{-1}$$

$$\left(\frac{1-v_1^2}{E_1} + \frac{1-v_2^2}{E_2} \right)^{-1}.$$

```
0023950157 24315.0
200000 59.7 0.0038584214 0.0021987962 0.02334537 0.011038199 2000
.002385325 1.8552.9
Loop time of 513.64 on 1 procs for 200000 steps with 5.47 atoms

Pair time (%) = 11.414 (37.2735)
Neigh time (%) = 13.8545 (2.69784)
Comm time (%) = 0.60542 (0.129988)
Outpt time (%) = 4.00426 (779741)
Other time (%) = 303.599 (59.149)

Nlocal: 5947 ave 5947 max 5947 min
Histogram: 1 0 0 0 0 0 0 0 0 0
Nghost: 0 ave 0 max 0 min
Histogram: 1 0 0 0 0 0 0 0 0 0
Neighs: 28090 ave 28090 max 28090 min
Histogram: 1 0 0 0 0 0 0 0 0 0

Total # of neighbor
Ave neighs/atom = 4
Neighbor list build
Dangerous builds =
System init for wr
```

LIGGGHTS®



**CFDEM®
workbench**

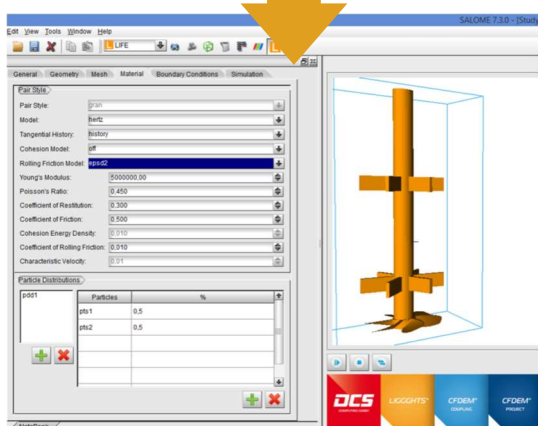
Power and liberty

Our leading DEM Simulation Software LIGGGHTS® as backend offers you unrivalled simulation speed and a huge variety of models. All this power comes with all liberty of open source software: No license costs at all for running simulations, unlimited number of users and all aspects of modelling can be fully inspected, extended and customized.



Ease of use

Our commercial, easy-to-use GUI as frontend guides you through simulation set-up. It offers modes for beginners and experts can be customized to your needs.



R & D

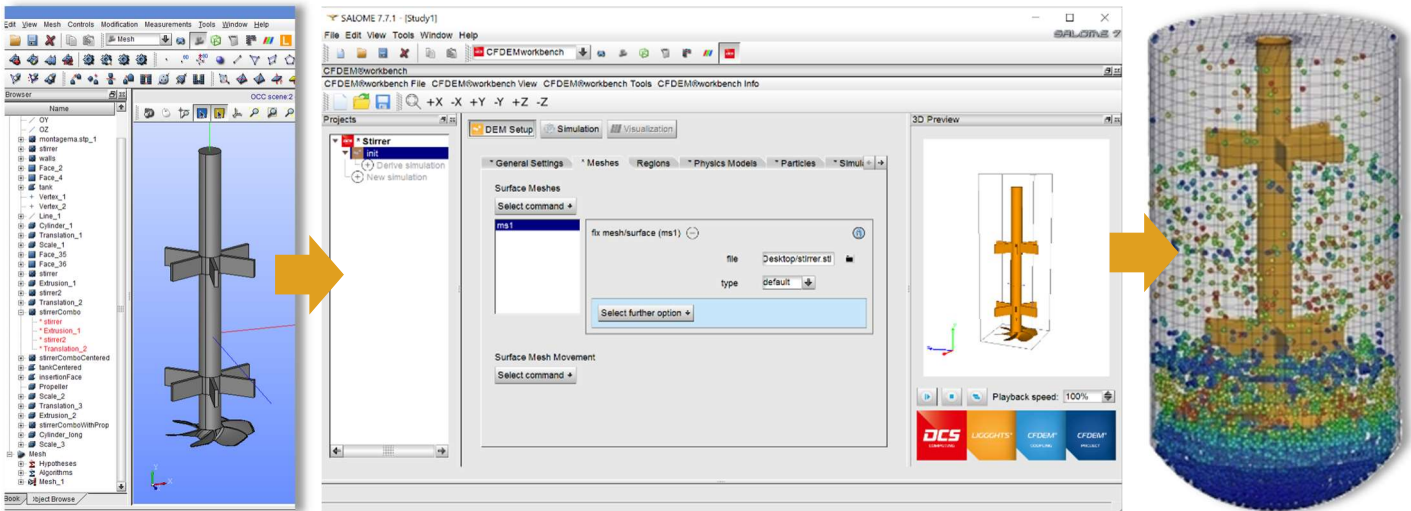
SIMULATION
SOFTWARE

CAE
SOFTWARE

CONSULTANCY

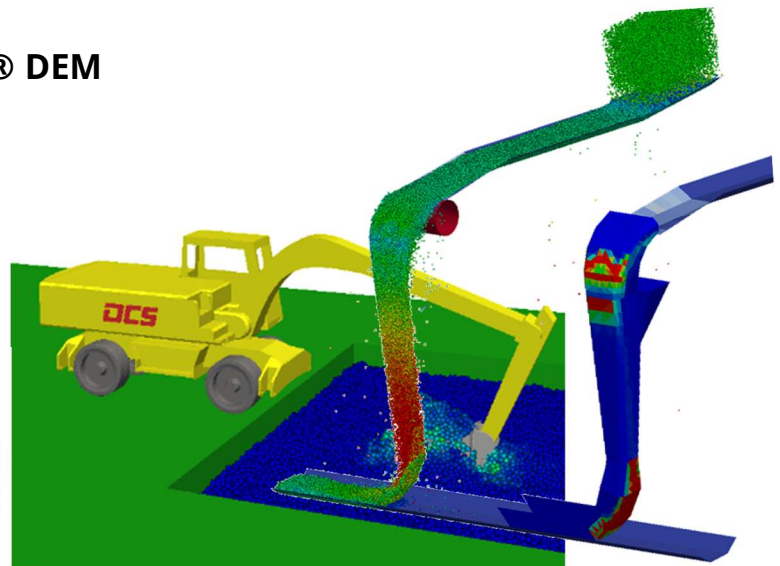


The whole process embedded in one user friendly tool



CFDEM®workbench for LIGGGHTS® DEM

- Geometry creation or import (IGES, STEP)
- Meshing with a variety of algorithms
- Guidance for DEM simulation setup
- Post-processing and data analysis
- Based on mature technology



▪ LIGGGHTS® Properties

- Highly scalable, efficient solver
- Million+ particles
- Extendable and customizable
- For desktop machines and clusters
- Linux and Windows® supported

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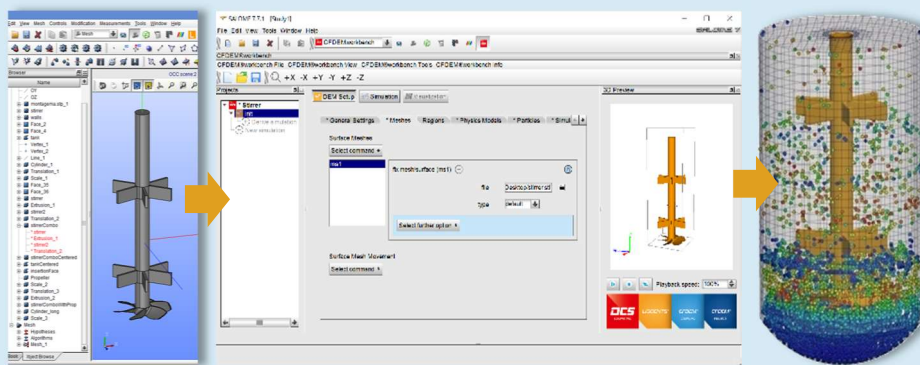


Graphical User Interface



CFDEM®workbench for LIGGGHTS® DEM

Available as **FREE STARTER OR PRO VERSION***



User friendly interface supporting the whole simulation process from geometry creation to post processing

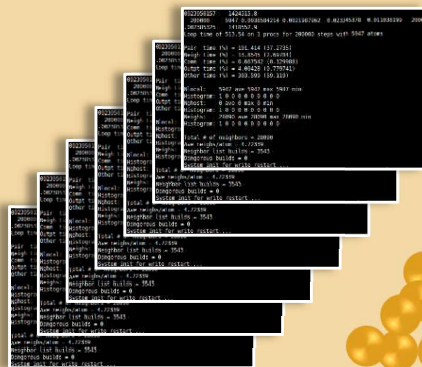


Simulation Engine

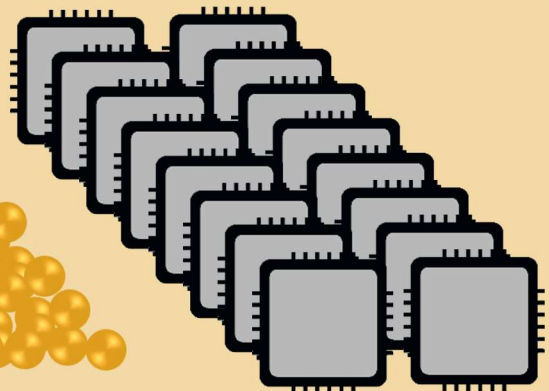
LIGGGHTS®

Available in LIGGGHTS® Public **FOR FREE**

Unlimited # of simulations



Unlimited # of cores



Unlimited # of particles

* See Spec-Sheet for details

Product Feature Matrix

LIGGGHTS®

CFDEM®
COUPLING



	LIGGGHTS® + CFDEM®coupling			CFDEM®workbench	
FEATURE	PUBLIC	PREMIUM	CONSORT	STARTER	PRO
Available to					
Industry	X	X	-	X	X
Academics	X	-	X	X	X
Available for					
Free	X	-	-	X	-
Yearly fee	-	X	-	-	X
Research project funding	-	-	X	-	-
OS supported					
Linux	X	X	X	upcoming	upcoming
Windows	-	-	-	X	X
License Simulation Engine					
GPL	X	X	X	X	X
License Graphical User Interface					
Commercial - per machine	-	-	-	X	X
Simulation Capability					
DEM	X	X	X	limited ¹⁾	X
CFD-DEM	X	X	X	-	drag force
Unlimited					
Number of Particles	X	X	X	X	X
Parallel Computation, MPI	X	X	X	X	X
Number of Simulations	X	X	X	-	X
Models available					
Standard ¹⁾	X	X	X	limited ¹⁾	X
Additional model set ¹⁾	-	X	on request	-	-
Model Customization + Support					
Customization by user	X	X	X	-	X
Customization by DCS	-	X	on request	-	-
DCS Support	-	50 hrs	-	-	2 hrs
DCS Quality Control					
Standard	X	X	X	X	X
Including customization	-	X	X	-	-
Graphical User Interface					
Available ¹⁾	-	-	-	X	X
Mesh import					
STL import (quality check, healing)	X	X	X	limited ¹⁾	X
Advanced CAD (feature removal)	-	X	-	-	on request
Post-Processing & Visualization of results					
Available ¹⁾	X	X	on request	limited ¹⁾	X

CFDEM®workbench

Hardware and software requirements



CFDEM®
workbench

Requirement	Minimal Configuration	Optimal Configuration
OS	Windows 7 / 64bit	Windows 10 / 64bit
Processor	Pentium IV	Dual or Quad Core
RAM	512 MB	4 GB
HDD	2 GB	5 GB
Video Card	64 MB	512 MB
Network	Depends on license type!	

CFDEM®workbench

Pricing and Licenses

FEATURE	STARTER	PRO
12-months-license		
Online activation / per machine license	FREE	on request
In-house activation / floating license	-	on request