Fabian Dedecker

Geomechanical Engineer

Expertise	Soil and Rock Mechanics, Numerical Modeling
Education	Ph D. (Civil Engineering), 1999 Postgraduate (Civil Engineering), 1995 Ecole Centrale Lyon, Ecully, France
	M.Sc. (Civil Engineering), 1994 University of Sciences and Technology, Lille, France

Professional Experience

1999 - Present	*Itasca Consultants S.A., Ecully, France, Project and Research Engineer*
1994 - 1999	*Ecole Centrale Lyon, Civil Engineering Department, Ecully, France, Scientific Collaborator*

Project Experience

Civil Engineering

♦ Study of static and dynamic stability of rock dams under cyclic hydraulic pressure loading using *PFC2D*.

♦ *PFC3D* modeling a furrow cutting using a plow to lay underwater cables. Study of beneficial effects and limits of Rock Ripper.

♦ Demonstration of the accuracy in applying an AC/DC model to a realistic 3D excavation and obtaining reasonable damage predictions when this model is assigned the *PFC3D Model for Rock*.

♦ Evaluation of the permeability of the failed/damaged zone around a 2-m radius tunnel by first computing probable micro-fracture networks in the post-peak and damaged zones and then assessing the equivalent permeability of such networks, using *PFC3D*.

♦ Elaboration of hydro-mechanical models by interpreting the disturbances observed during the sinking of the main shaft of an underground laboratory in Eastern France using *PFC2D*.

Mechanical Engineering

♦ Study of hydraulic conductivity evolution in a fractured rock submitted to high hydraulic pressure in a geothermal injection well using *PFC2D*.

♦ Evaluation of mechanical behavior in a completely non-cemented sandstone with perforations located away from the caprock interface using *PFC3D*.

♦ *PFC2D* modeling of blade displacements and contact force evolution in a granular material until stationary movement occurs (in front of the blade).

♦ *PFC2D* modeling of interactions between soil and landing gear; two-dimensional study on contact force evolution and toppling effects using.

♦ *PFC2D* modeling of fracture evolution in rock masses made of several sedimentary rocks.

Process Engineering

♦ *PFC3D* modeling of an experimental compaction process (shock test) and analysis of binary and ternary granular mixtures on the minimal porosity of the assembly.

♦ *PFC3D* modeling of a sieve process by considering the flexibility of the wire.

Analytical Developments in Soil Mechanics

♦ Development of constitutive models, based on micro- mechanical approaches, taking into account scale changes in granular materials with complex interactions: local kinematics (rolling, sliding and displacement of particles that are not in contact), influence of contact couples, and study of cemented granular material failure (Ecole Centrale Lyon).