



Serving your process needs

The publisher, distributor and support of the BRGM process analysis software

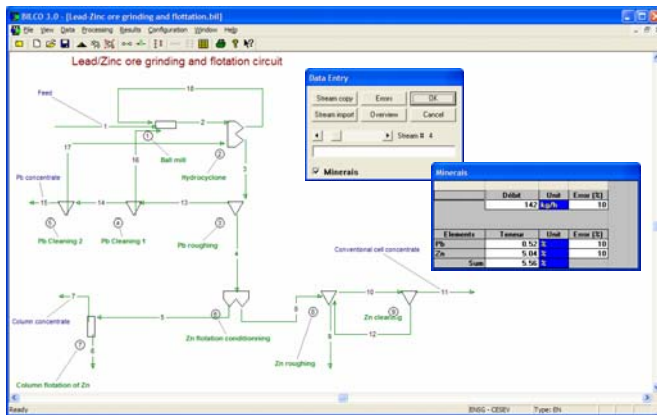
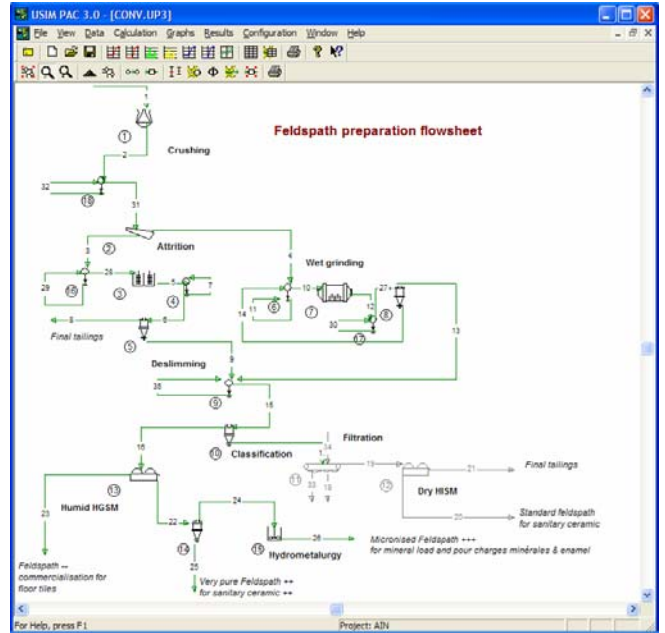
# A range of software for process analysis

## USIM PAC

A powerful tool for mineral processing engineers.

Based on a large set of unit operation models, USIM™ PAC can simulate a wide range of mineral processing plant.

USIM PAC increases your efficiency during process design, plant sizing, plant survey, process optimization, increase of capacity...



## BILCO

BILCO™ provides you with a quick and accurate material balance for your periodic metallurgical accounting and detailed plant performance survey.

The ability of BILCO to solve complex problems allows the calculation of complete coherent material balances of pilot plant campaigns.

## ECHANT

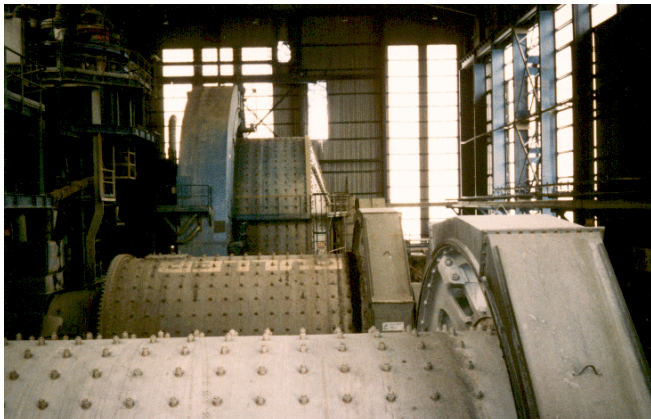
ECHANT™ is an aid in the design of sampling protocols for any solid materials.

ECHANT is a key factor in your quality management by calculating the level of confidence of your measurements.



# Process design and optimization

## USIM PAC



### Fields of application

All types of ore and mineral such as :

- \* Iron ore,
- \* Base metals: oxidized and sulfide ores
- \* Precious metals: gold, silver...
- \* Phosphate, potash
- \* Industrial minerals: kaolin, feldspar, carbonates, talc
- \* Construction material: sands and gravels, cement, clay, plaster...

### A user-friendly interface focused on process engineers tools

The flowsheet is easily drawn using a set of unit operation pictograms.

A click on a stream gives access to:

- \* The material flowrate, size distribution and composition;
- \* The size distribution and washability curve.

A click on a unit operation gives access to:

- \* The unit size and settings, the mathematical model parameters;
- \* The partition curve and the split curve.

Tables allow to display the global plant performances.

Parameters	Values
Number of steps	1
Organic/Aqueous flowrate volumetric ratio if regulated	0
Entrainment of Organic in Aqueous (g of O per kg of A)	0
Entrainment of Aqueous in Organic (g of A per kg of O)	0
Reactions	Edit
Isotherm function	Edit
Isotherm definition	Edit
Correspondance for isotherm definition	Edit

	Value	Unit
<b>Ore/flotation</b>		
Mass flowrate	0.915658	t/h
Volumetric flowrate	0.209448	m <sup>3</sup> /h
Density	4.37177	kg/dm <sup>3</sup>
<input checked="" type="checkbox"/> Component grade per size		
<input checked="" type="checkbox"/> Floating ability per component		
<b>Water</b>		
Mass flowrate	2.5219	t/h
Volumetric flowrate	2.5219	m <sup>3</sup> /h
Density	1	kg/dm <sup>3</sup>
<b>Pulp</b>		
Mass flowrate	3.43756	t/h
Volumetric flowrate	2.73135	m <sup>3</sup> /h
Solid percent	26.6369	%
Density	1.25856	kg/dm <sup>3</sup>

### Unit operation models

Crushing, grinding, attrition, fine grinding;  
Size classification, gravity and magnetic separation, flotation;

Solid-liquid separation: settling, thickening, filtration;

Hydrometallurgy: Leaching, CIP, CIL, precipitation, solvent extraction, electrowinning.

### Powerful algorithms and methodologies for:

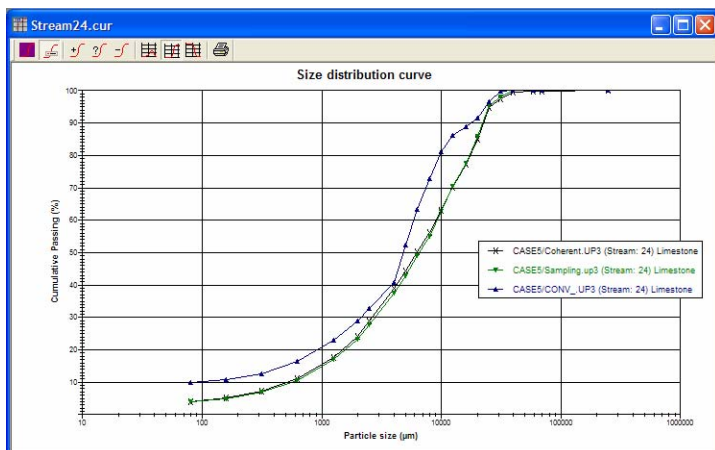
Plant simulation;

Unit sizing;

Equipment setting optimization;

Capital cost estimation;

Sensitivity analysis to evaluate process flexibility.



# Data quality enhancement

## BILCO

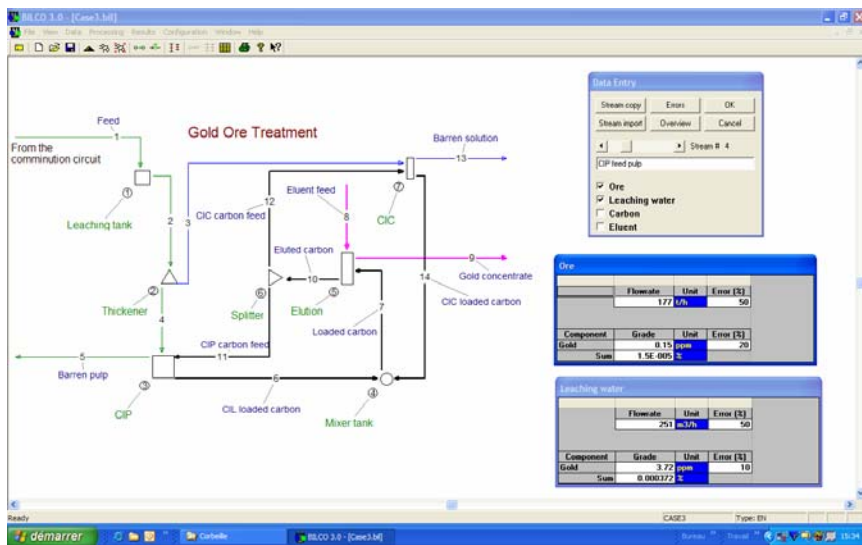
### Data reconciliation by material balance

For a vast number of applications: mass balance, chemistry-mineralogy reconciliation, sensor implementation strategy.

Simultaneous calculation for flowrates and detailed composition relatively to the level of confidence of measured data.

Calculation of the accuracies of the coherent data.

Configurable material conservation laws for each unit operation: partial conservation, phase transfers...



Elementary constraints		Balance (i - o)
Ore/Flowrate		-27 t/h
Leaching water/Flowrate		1 m3/h
Carbon/Flowrate		0 kg/h
<b>Constraints sums</b>		
Ore/Gold + Leaching water/Gold + Carbon/Gold		0.0002554 t/h

## ECHANT

### A sampling-aid tool

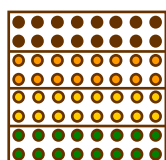
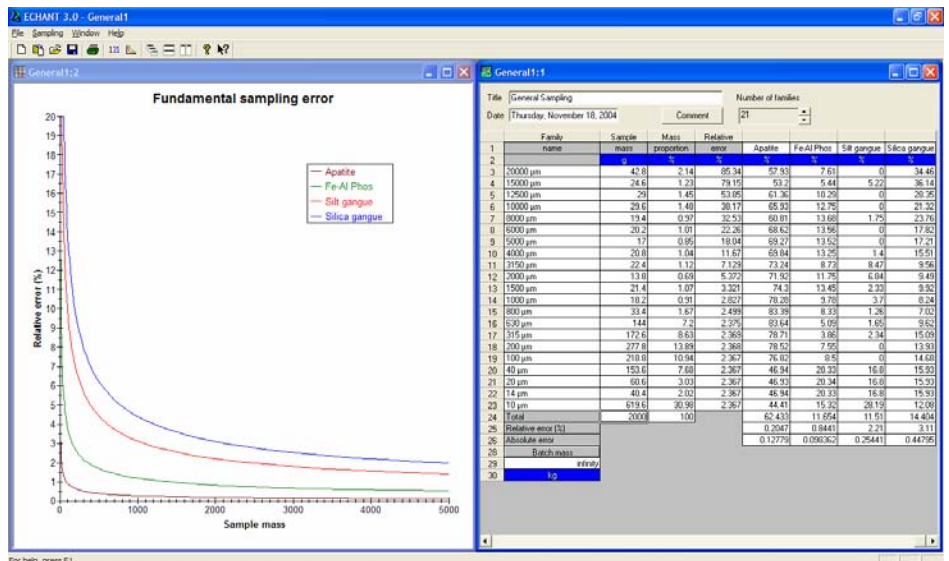
Based on the Pierre Gy theory.

Calculation of the Fundamental Sampling Error (FSE) for a given sample mass and vice versa.

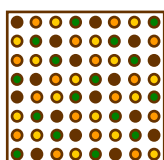
Design of a step by step Sampling Plan for ores and calculation of its FSE.

Plot of the FSE variation versus the sample mass.

Various material examples illustrating the diversity of heterogeneity description.



Heterogeneity of composition  
Heterogeneity of distribution



Heterogeneity of composition  
Homogeneity of distribution



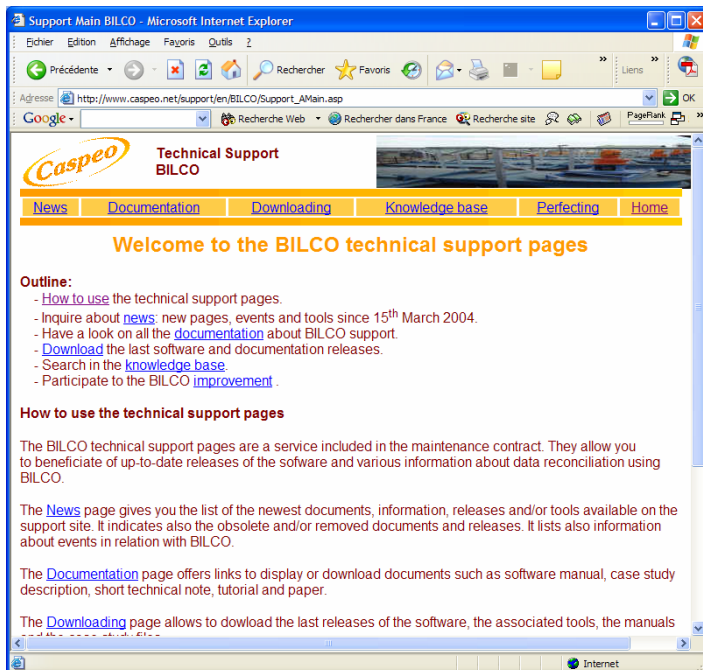
Serving your process needs

## Associated services

### Training

Customer-specific training sessions for sampling, data reconciliation, process modeling and simulation.

Largely based on case studies.



### Support

Annual subscription.

Hotline (phone, fax, e-mail).

Access to the support web site.

Downloading of new software or documentation releases.

News, FAQ, technical notes, case studies.

## More than 150 customers

### Among them:

Eramet, CVRD, Codelco, Rio Tinto, Xstrata, LKAB, Newmont, Fosfertil, ICS, OCP, Kazzinc, De Beers, Imerys, Nordkalk Corporation, Sofremines, Iscor Mining, Fluor Australia, CSIRO, MichiganTech, Indian Bureau of Mines, Luleå University of Technology, AJ Parker Center.

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