

RocLab 1.0 versus RocData 4.0

Applicable Materials

	RocLab 1.0	RocData 4.0
Rock	yes	yes
Soil	no	yes
Joints	no	yes

Failure Envelope Plots

	RocLab 1.0	RocData 4.0
Principal Stress (Sigma1 vs Sigma3)	yes	yes
Shear-Normal (SigmaN vs Tau)	yes	yes

Failure Envelopes (Strength Criteria)

	RocLab 1.0	RocData 4.0
Generalized Hoek-Brown	yes	yes
Mohr-Coulomb	yes*	yes
Barton-Bandis	no	yes
Power Curve	no	yes

* Note: in *RocLab*, equivalent Mohr-Coulomb parameters are calculated from the Generalized Hoek-Brown envelope over a given stress range. However, the Mohr-Coulomb criterion is not available (in *RocLab*) as an explicit option for interactive failure envelope analysis or curve-fitting of test data.

Interactive Failure Envelope Analysis

Interactive failure envelope analysis allows you to enter/edit the strength criterion parameters, instantaneously view the change in the failure envelopes (principal stress and shear-normal plots), and graphically sample the data at any location on the envelope.

	RocLab 1.0	RocData 4.0
Generalized Hoek-Brown	yes	yes
Mohr-Coulomb	no	yes
Barton-Bandis	no	yes
Power Curve	no	yes
Stress sampler	yes	yes
Instantaneous MC sampler	yes	yes

Equivalent Mohr-Coulomb Parameters for Non-Linear Envelopes

	RocLab 1.0	RocData 4.0
Generalized Hoek-Brown	yes	yes
Barton-Bandis	no	yes
Power Curve	no	yes

Estimation of Input Parameters

Interactive tables and charts, which assist the user to determine suitable values of input parameters for the strength criteria.

	RocLab 1.0	RocData 4.0
Generalized Hoek-Brown ¹	yes	yes
Mohr-Coulomb ²	no	yes
Barton-Bandis ³	no	yes

Notes:

1. estimate GSI, m_i , intact UCS and D
2. estimate cohesion and friction angle for a variety of rock and soil types
3. estimate basic/residual friction angle, JRC, JCS

Curve Fitting of Test Data

<i>Strength Criterion:</i>	RocLab 1.0	RocData 4.0
Hoek-Brown (lab data / intact rock)	yes	yes
Generalized Hoek-Brown (rock mass / field data)	no	yes
Mohr-Coulomb	no	yes
Barton-Bandis	no	yes
Power Curve	no	yes
<i>Test Data:</i>		
Triaxial test data ¹	yes	yes
Direct shear test data ²	no	yes
Display of data on plots ³	no	yes

Notes:

1. Triaxial test data can be fit using Hoek-Brown, Mohr-Coulomb or Power Curve criteria
2. Direct shear test data can be fit using Mohr-Coulomb, Power Curve or Barton-Bandis criteria
3. Triaxial test data can be displayed as points on the principal stress plot, and as Mohr circles on the shear-normal plot. Direct shear data can be displayed as points on a shear-normal plot, and is not displayed on the principal stress plot.

Curve Fitting Methods

	RocLab 1.0	RocData 4.0
Levenberg-Marquardt ¹	yes	yes
Simplex ²	no	yes
Linear Regression ³	no	yes

Notes:

1. The L-M method can be used in conjunction with all non-linear or linear strength envelopes
2. The Simplex method (in *RocData*) can be used with all strength envelopes except Mohr-Coulomb
3. Linear Regression (in *RocData*) is only available for Hoek-Brown (intact lab data) and Mohr-Coulomb

Measurement Units

	RocLab 1.0	RocData 4.0
MPa	yes	yes
Kilopounds/ft2 (ksf)	yes	yes
Kilopounds/in2 (ksi)	yes	yes
Tonnes/m2	no	yes
kPa	no	yes
Pounds/in2 (psi)	no	yes
Pounds/ft2 (psf)	no	yes
Tons/ft2	no	yes

RocProp Database

RocProp is a rock properties database program which is included with *RocData*, and runs as a standalone application. *RocProp* currently contains over 600 test records of intact rock properties from worldwide sources, including compressive strength, tensile strength, elastic properties, Hoek-Brown parameters and velocity parameters. The database can be searched and filtered in various ways, and allows users to add their own data to the database.

	RocLab 1.0	RocData 4.0
RocProp Database	no	yes