RocData 5.0

Analysis of rock, soil and discontinuity strength data

roc*science* *software tools for rock and soil*

RocData is an interactive toolkit for the analysis of rock and soil strength data. Strength envelopes and other parameters can be determined from curve-fitting of test data. RocData includes RocProp, a database of intact rock properties which runs as a standalone application.

Strength Criteria

Strength criteria include linear Mohr-Coulomb and non-linear Generalized Hoek-Brown, Barton-Bandis and Power Curve. These can be applied in the analysis of intact rock, rock mass, soil or discontinuity (joint) strength data. *RocData* is highly interactive and allows you to easily test different strength parameters and observe how they impact a failure envelope. Input parameters can be estimated from built-in charts and tables. Equivalent Mohr-Coulomb parameters are calculated for non-linear envelopes.

Curve Fitting of Test Data

Strength test data from triaxial or direct shear tests can be entered to determine the "best fit" strength envelope and associated parameters (e.g. cohesion and friction angle) for a rock or soil. The data can be obtained from lab tests of intact samples, or field data from insitu rock mass tests. Failure envelopes are plotted in both shear-normal and principal stress space. *RocData* results can be used as input for numerical analysis programs such as *Slide* or *Phase²*.

RocProp Database

RocData includes *RocProp*, a database of intact rock properties which currently contains over 600 test records from worldwide sources. The data includes rock type, geographical location, compressive and tensile strength, elastic properties, Hoek-Brown parameters and velocity parameters. The database can be searched and filtered in various ways, and allows users to create charts, generate statistical information, and add their own data in a user database.
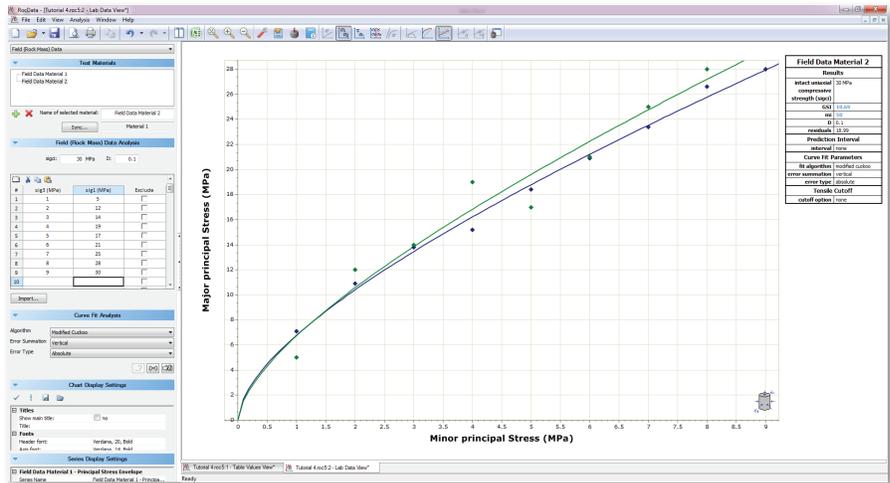
Best-fit strength envelopes for two materials (triaxial test data).
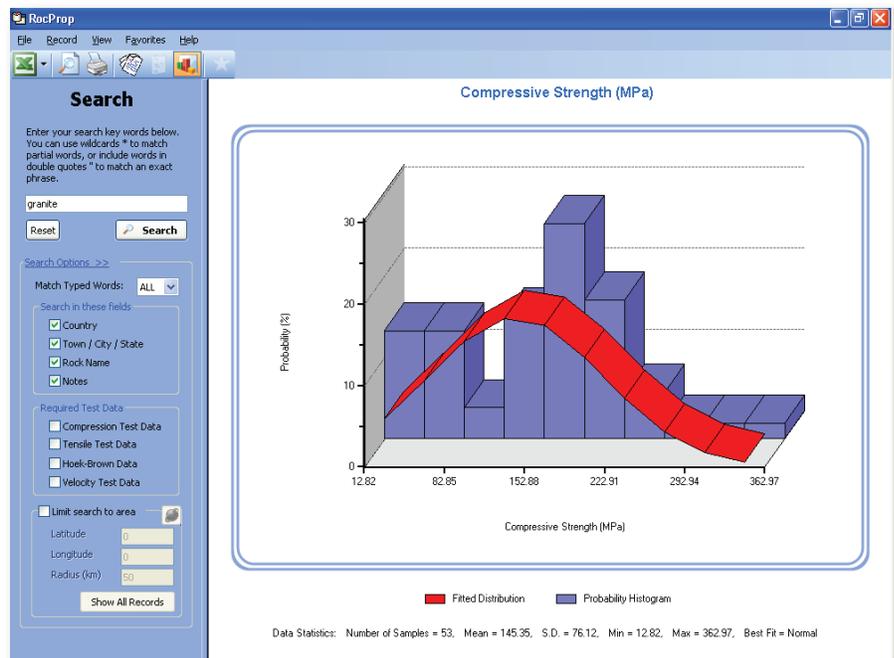
RocProp histogram chart of compressive strength data for granite. The best fit statistical distribution is also displayed.

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Technical Specifications

Major principal Stress (MPa)
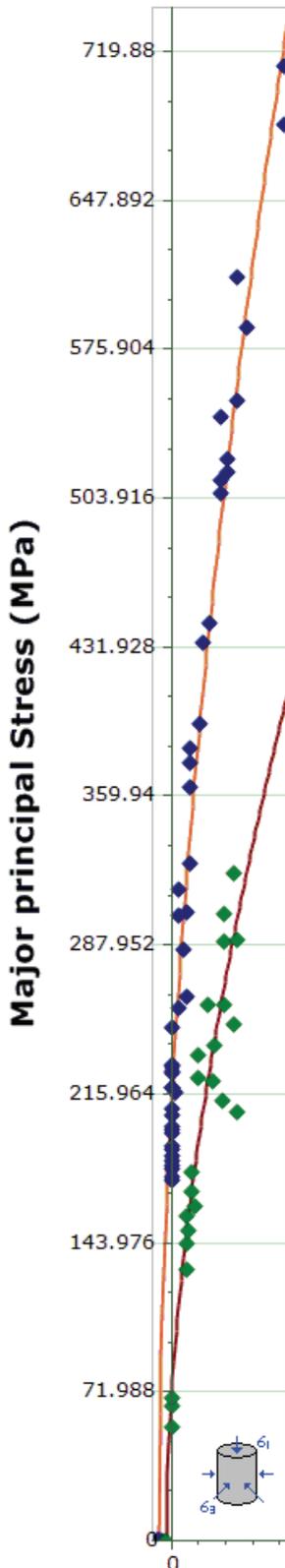
Minor principal Stress (MPa)

Strength Criteria

- Mohr-Coulomb
- Generalized Hoek-Brown
- Barton-Bandis
- Power Curve

Stress Units

- Metric (MPa, kPa, tonnes/m2)
- Imperial (psi, psf, ksi, ksf, tons/ft2)

Analysis of Test Data

- triaxial or direct shear test data
- lab or field (rock mass) data
- curve fitting methods: Modified Cuckoo, Levenberg-Marquardt, Simplex, Linear Regression, user defined
- error summation: vertical, basic, parabolic tensile, Generalized Fairhurst
- absolute and relative best fit residuals
- data entry – in spreadsheet, from clipboard, import file (.roc, .rlb, .txt., .csv)
- tensile cut-off options
- data uncertainty analysis

Failure Envelope Plots

- principal stress plot (sigma1, sigma3)
- shear-normal plot (tau, sigmaN)
- linearized principal stress plot ((sigma1-sigma3)2 , sigma3)
- interactive plot display
- stress sampler
- instantaneous Mohr-Coulomb sampler
- equivalent Mohr-Coulomb envelope for non-linear criteria
- display test data on plots
- multiple materials
- formatting and customization of plots

Estimating Input Parameters

- GSI calculator
- Estimation of input parameters from built-in charts and tables:
- GSI, mi, sigci, D
- c, phi
- JRC, JCS, phir

Additional Output Parameters

- Hoek-Brown: rock mass tensile strength, compressive strength, deformation modulus
- Mohr-Coulomb: uniaxial compressive strength, alpha angle
- Power Curve: uniaxial compressive strength, tensile strength

Equivalent Mohr-Coulonb Parameters

- equivalent cohesion and friction angle for non-linear criteria
- user-defined stress range
- instantaneous (tangential) cohesion and friction angle

Exporting Results

- one click export to Excel
- copy to clipboard
- export image file (.jpg, .bmp, .gif, .png)
- export *Slide* shear-normal function

Info Viewer

- one click export to Excel
- copy to clipboard
- export image file (.jpg, .bmp, .gif, .png)
- export *Slide* shear-normal function

RocProp Database

- primary database of intact rock properties (600+ records)
- search and filter by rock type, data type, geographical coordinates etc.
- charting and statistics
- user database
- link to Google maps
- export to Excel

Price & Licensing

RocData 5.0 is sold at the prices listed below.

Personal License (no USB key) $595 USD ($595 CAD)

Portable License (Uses USB key) $895 USD ($895 CAD)

Flexible Licenses are also available; they are sold as a yearly subscription, with price based on the number of concurrent users.

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