Empirical Comparison of Sample Configurations

Laboratory Testing

New Concept Mining
Support for the World's Deepest Mines
Background:
Sample Configurations

- **Continuous-Tube Configuration**
  Loading Applied Directly to the Sample

- **Split-Tube Configuration**
  Loading Applied In-Directly to the Sample

- **Multi-Split-Tube Configuration**
  Loading Applied Directly to the Sample
Sample Configurations
Simplified Continuous-Tube

Supported Mass

Competent Mass
Sample Configurations
Simplified Continuous-Tube

Supported Mass

Competent Mass
Sample Configurations
Simplified Continuous-Tube

Supported Mass

Competent Mass
Sample Configurations
Simplified Continuous-Tube

Supported Mass

Competent Mass
Sample Configurations
Simplified Split-Tube
Sample Configurations
Simplified Split-Tube

Supported Mass

Competent Mass
Aim
Aim
Empirically determine the relationship between the sample configurations for a multi-anchor rock bolt

Hypothesis
The Multi-Split-Tube Configuration will be equivalent to the summation of the Split-Tube and Continuous Tube Configurations
Apparatus & Method
Multi-Split-Tube Dynamic Sample

- Impact Plate
- Impact Load Cell
- Grouted Sample
- Receiver Tube Coupler
- Flag Extension
- Split In Sample Tube
- 150 Square 8 mm Face Plate
Method:

- **30 kJ**
- **5.4 m/s**
- **Multiple Impacts**
- **Compare Cumulative Displacement & Energy**
Single Impact

Graph showing load (kN) versus displacement (mm). The graph includes multiple lines and diagrams illustrating the impact process.
Test To Rupture

Multi-Split
Comparison: Multiple Impacts
Comparison: Sample Inspection
Considerations
Considerations

- Sample Size
- Absorption Method
- $E_k = 0.5mv^2$
- $p = mv$