The JK Rotary Breakage Test is now commercially available, and offers industry a rapid method for determining accurate and reliable impact breakage characterisation data for plant design and optimisation.

**The JK Rotary Breakage Test**

In an AG/SAG mill there are two main mechanisms of breakage, namely impact (high energy) and abrasion (low energy). The industry accepted JK impact breakage parameters, A and b, can reliably be determined using the new generation high throughput JK Rotary Breakage Tester® (JKRBT®).

The JK Rotary Breakage Test provides these breakage parameters for use in the JKSimMet mineral processing simulator software to analyse and predict AG/SAG mill performance. The same test procedure also provides ore type characterisation parameters for the JKSimMet crusher model.

In conjunction with the development of the JKRBT®, the JK Centre has also developed a new breakage model. The new model links $t_{10}$ and specific impact breakage energy $E_{cs}$ via 2 material specific parameters ($f_{mat}$ and $E_{min}$) that can in turn be directly related to A and b.

![Image of JK Rotary Breakage Test](image)

**Accessing the JK Rotary Breakage Test**

JKTech clients can benefit from the impact breakage characterisation, provided by the JK Rotary Breakage Test, by either purchasing the JKRBT® device and technology license for in-house testing, or by sending samples for testing to JKTech’s Laboratory Services or a licensed service provider.

The new test and breakage model have undergone rigorous industrial testing and validation, at the JK Centre and selected in-house mining company laboratories around the world, for use in characterising ore under crushing and AG/SAG milling conditions.
Benefits

The JK Rotary Breakage Test is the new generation of ore breakage characterisation designed for rapid generation of reliable impact breakage data. This data can be used in the design of AG/SAG mills and crushers for new projects and also in optimisation projects for existing plants.

Experience has shown that one complete JKRBT® test can deliver statistically similar breakage results to an equivalent JK Drop Weight Test, on the same sample, in significantly less time.

This provides scope for more particles (>100) to be tested to improve the statistical significance of the test results, or improve the statistical significance of a series of tests by conducting more tests in the same time. The breakage result repeatability of the test has also proven to be exceptional.

Abrasion Breakage Testing Procedure

It is also possible to characterise low energy (abrasion) breakage with the abrasion test. The standard abrasion test tumbles 3 kg sample in a standard abrasion test mill.

The resulting product is then sized and the t₃₅ parameter determined. These values are used together with the results of the JK Rotary Breakage Test or JK Drop Weight Test to design and optimise AG/SAG mills with a high degree of confidence.

Sample requirements

The minimum quantity of sample required to provide sufficient particles for testing is 100 kg of crushed rock in the -53+12.5 mm size range, or 100 kg of drill core.

JKTech can prepare a sample to the specified size range from a larger amount if required.

Slightly more material is preferred if Bond Work Index testing is also required.

JKTech Services

- Consulting (comminution, flotation, mineralogy, mining & geometallurgy, social responsibility, risk management, and sustainability)
- Specialist Software (JKSimMet, JKSimFloat, JKMultiBal, JKSimBlast)
- Specialist Equipment (ore breakage characterisation, flotation characterisation)
- Metallurgical Laboratory Services
- SMI Knowledge Transfer

JKTech’s range of technologies is supported by the ongoing research activities of the Sustainable Minerals Institute at The University of Queensland.