Testing & Software
SPECIALISED TOOLS AND CUTTING EDGE TECHNOLOGY TO GAIN COMPETITIVE ADVANTAGE
The JK Drop Weight Tester is the authorised specialist equipment required to conduct the JK Drop Weight (JKDW) and SMC Test®. Both tests are proven global industry standards for ore breakage characterisation.

JKDW and SMC Tests® are licenced to 37 metallurgical laboratories across 82 countries. To date over 42,000 tests have been completed across more than 32 different commodities.

**JK Drop Weight Test**

The JKDW test is now an industry standard for ore characterisation. It measures resistance of a sample to impact breakage using JK breakage parameters, A and b. These parameters are used in JKSimMet for design and optimisation of AG/SAG mill, HPGR and crusher circuits. Additional parameters such as t10, ta and Ecs can also be determined using the JKDW test.

The JKDW test requires 100 kg of crushed rock in the size range -63+4.75 mm (120 kg of full drill core greater than 65 mm diameter is also suitable).

**SMC Test®**

The SMC Test® developed by Dr Steve Morrell of SMC Testing is a cost-effective means of profiling an ore body.

The SMC Test® was originally designed for the breakage characterisation of drill core. The results of the SMC Test® can be used to determine various parameters such as the Drop-Weight index (DWI), JK rock breakage parameters A and b, JK abrasion parameter ta, the t10-Ecs size-energy matrix for crusher modelling and comminution parameters Mia, Mih and Mic used for power-based calculations.

SMC Testing requires 30 kg of drill core samples or lump rock remnants from previous testing or from the parent sample.

When a number of SMC Tests® are to be carried out on an ore body, it is recommended to perform an SMC Test® and a JKDW Test from each ore domain to provide the best correlation for the ore body profile. JKTech offers a combined SMC/DWT which is a cost effective option to calibrate the SMC Test® results to that of the full JKDW Test.

**The Integrated JKDW and SMC Test®**

A new form of test has been developed which enables both JKDW and SMC Test® parameters to be determined using a simplified procedure.

The major advantage of the new ‘Integrated Test’ for clients is being able to obtain both JKDW and SMC Test® parameters using a reduced amount of sample when compared to performing both tests separately.

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**The SCSE parameter is the expected power draw for the sample when modelled using the ‘standard’ circuit. The SCSE parameter allows a more intuitive comparison between samples than the A*b parameters, and is now reported for all JKDW and SMC Tests®.**

**JK Bond Ball Mill Test**

The JK Bond Ball Mill (JKBBM) test, is a locked cycle grindability test conducted using a standard laboratory Bond Ball Mill with the same steel ball charge and material feed size (100% passing 3.35 mm) as the Bond Ball Mill Work Index (BBMWi) test.

The JKBBM test is an improved method which requires approximately 50% less material than the BBMWi test. This test can be reliably applied to samples that have previously been excluded from testing due to mass limitations. Added benefits of this test is a lower cost and faster turnaround compared with the BBMWi test and it is underpinned by the JK Quality Assurance program.

The JKBBM test requires 5 kg of material, with the material being crushed to -3.35 mm for the test.

**SAG Circuit Specific Energy**

Due to the non-linear aspect of A*b as a hardness measure, the SAG Circuit Specific Energy (SCSE) concept has been introduced as an additional parameter to enable a more intuitive measure of ore hardness. The SCSE was developed by extensive modelling over a range of A*b, ta and SG values, using the concept of a ‘standard’ SAG mill with pebble crusher circuit.

The SCSE parameter is the expected power draw for the sample when modelled using the ‘standard’ circuit. The SCSE parameter allows a more intuitive comparison between samples than the A*b parameters, and is now reported for all JKDW and SMC Tests®.

**JK Quality Assurance**

JKTech carries out regular quality control testing of the laboratories licenced to perform JKDW, SMC and JKBBM Tests to ensure that results are all within acceptable statistical limits. This means that clients can be confident that results are accurate whichever laboratory performs the testwork.
Powerful simulation software applications for Optimisation and Design

Software

JKSimMet

Our flagship software product JKSImMet, a comminution and classification circuit simulator, has been developed by JKTech to encapsulate the results of 40 years of comminution and classification research at the JKMRC from The University of Queensland. It has been used for decades to design and optimise the performance of crushing and grinding circuits.

The package is designed for plant and development metallurgists who wish to apply process analysis techniques to characterise and optimise plant performance, and design engineers who require process simulation models to assess design alternatives.

JKSimFloat

JKSimFloat is a general purpose computer software package for the simulation of flotation plant operations. The package is designed to service the diverse needs of plant and development metallurgists, design engineers, researchers and consultants.

JKTech's range of software products also cover, mass balancing and rock fragmentation through blasting. Our significant world-wide sales are testimony to our software products broad application and effectiveness.

JKTech is proudly owned by The University of Queensland and is the technology transfer company for the Sustainable Minerals Institute.