IMP has been providing complete solutions from sampling to analysis for the mining and metallurgical industries since 1987.
Particle Size Measurement

Sieve Master Airjet SM A 200, Sieve Master SM 200A  
(Sieve Master SM 200, Sieve Master 300A  
Sieve Master SM 400, Robot Fed Sieve Master 450AR  
Manual Sieve Master 450AR, RoTap Sieve Shakers, Manual Large Capacity Screen Shakers  
Automated Large Capacity Screen Shakers, Laser Particle Size Analysis  
Online Oversize Detection System  
Cyclosizer M16, MYTIS At line Online Particle Size Analysis  
PICCELL On-line Particle Size and Shape Analysis,  
PICTOS At-line Online Particle Size and Shape Analysis  
PICTIS At-line Online Particle Size and Shape Analysis,  
Sieve Calibration and Measurement System
IMP provides a comprehensive innovative range of solutions for determining particle size. These solutions range from manually operated desktop machines to fully automated systems. In-line and on-line systems are also available.
Particle Size Measurement
Sieve Master Airjet SM A 200

The IMP SM-A 200 is specifically designed to determine particle size down to 20 microns on dry samples. The machine uses 200mm diameter sieves, but sieves up to 400mm in diameter can be used with an adapter. The maximum mass of sample is usually around 200g but is dependent on the density of the material.

The machine uses a pulsed air jet and a vacuum system to agitate and separate the samples. Using preheated air, the air jet system can be used to determine particle size on hygroscopic materials.

The airjet which is responsible for the extremely good dispersion is generated by a vacuum cleaner and then conducted through a rotating slot nozzle positioned beneath the screening area. In order to reduce the screening period and to achieve a more exact screening, the machine is fitted with a newly developed form of slot nozzle. Through the screen apertures the finest particles are drawn into the vacuum cleaners container where they are collected.

The necessary vacuum may be finely adjusted and is shown on a digital display. The latter also applies to the screening period. An optional conversion kit allows for the use of 400mm test sieves.

Sieve Master 200A

The IMP Sieve Master 200A is the economical solution to automated sample particle size analysis. It substantially reduces the resources required for manual particle grading, minimises the risk of operator error, and frees up valuable time that the operator can use to perform other tasks.

Standalone PC or integrated PLC control is available, with the machine being easily incorporated as part of IMP’s larger automated systems. The Sieve Master 200A is able to process up to 6 samples automatically, one after the other with no outside input required. The machine can also be integrated into an automated system and fed via a robotic arm.

The Sieve Master uses either full or half-height 200 mm round test sieves, which can be easily inserted and changed to suit specific test requirements. The machine can accommodate up to 9 half height sieves and 4 full height sieves. It shakes and taps for a pre-set amount of time, using the same stroke and frequency as RoTap manual shakers.

Unlike the RoTap shakers, the sieve stack does not have to be loaded and unloaded by the operator for each sample. Additionally, the initial sample and the resulting fractions are weighed and recorded automatically which eliminates operator error.
Sieve Master SM 200

The SM 200 is a gravity-screening machine that utilizes standard 8 or 200mm test sieves. The machine can be used for wet sieving applications with the optional wet sieving attachment. Due to this unique 3D motion, the feed material is distributed evenly over the screen area which ensures quick separation.

The innovative electronic control on the SM 200, together with the vibration sensor fitted to the vibrating plate ensures a constant vibration amplitude irrespective of the loading.

All mechanical parts, the electro-magnetic drive with specially tuned double spring system and the electronic controls are all fitted into the stainless steel housing. The sieve set is easily fitted to the vibrating plate and fixed with the quick locking device. A clear plastic lid enables you to view the screening action and monitor the SM 200’s performance. Wet screening is also possible by using special accessories such as a cover with a water spray facility and the collection pan with spout.

The SM 200 is completely maintenance-free due to a clever design combined with high quality components. The simple and well thought out keyboard is impervious to dust and water for maximum user friendliness.

It is possible to alter the vibration amplitude, as well as enabling a pulse mode of operation for difficult samples, along with various timer functions.

Sieve Master 300A

The IMP Sieve Master 300A is the economical solution to automated sample particle size analysis. It substantially reduces the resources required for manual particle grading, minimises the risk of operator error, and frees up valuable time that the operator can use to perform other tasks.

The Sieve Master 300A is able to process up to 6 samples automatically, one after the other with no outside input required. The machine can also be integrated into an automated system and fed via a robotic arm.

It uses the same shaking and tapping action as the RoTap range of manual sieve shakers. Unlike the RoTap shakers, the sieve stack does not have to be loaded and unloaded by the operator for each sample. Additionally, the initial sample and the resulting fractions are weighed and recorded automatically which eliminates operator error.

The machine is able to accept 12 standard half-height sieves or 6 full-height sieves, which can be customised to user’s requirements. The whole machine is controlled from a single PC with tests being initiated by a click of a mouse.
Sieve Master SM 400

The SM 400 is a vibration assisted gravity-screening machine that can accommodate up to 400mm diameter standard sieves. Wet sieving is possible with a wet screening attachment.

The innovative electronic control on the SM 400, together with the vibration sensor fitted to the vibrating plate ensures a constant vibration amplitude irrespective of the loading.

All mechanical parts, the electro-magnetic drive with specially tuned double spring system and the electronic controls are all fitted into the stainless steel housing. The sieve set is easily fitted to the vibrating plate and fixed with the quick locking device.

A clear plastic lid enables you to view the screening action and monitor the SM 400's performance. Wet screening is also possible by using special accessories such as a cover with a water spray facility and the collection pan with spout.

Robot Fed Sieve Master 450AR

The Sieve Master 450AR is a large diameter automated sieving machine that accepts 450 mm sieves for particle size analysis. This machine is typically used for large mass samples and is integrated into an automated robotic system.

Samples are transferred automatically from other areas of the facility, and are loaded via the laboratories robotic arm. The sample information and results are processed via the central LIMS and are recorded instantly. The 450AR is typically integrated with an external balance for sample weighing, as well as a dedicated sieve cleaning unit.
RoTap Sieve Shakers

The Ro-Tap® Sieve Shaker series are a manual alternative to the IMP Sieve Master 200 and 300 automated particle size analysis machines.

They are typically used in a laboratory setting for applications which require a rotary shaking and tapping action. Unlike the Sieve Master 200A and 300A, sieves must be manually loaded for each test run, and the initial sample and the resulting fractions weighed out by hand.

Manual Large Capacity Screen Shakers

These large scale screen shakers are designed for analysing particle sizes above 40 mm. The sample quantity increases when testing these sizes, by increasing the screen area this is compensated for and representative screening is achieved. For this purpose we have machines with screen areas of 500 x 500mm, 600 x 600 mm and 1000 x 1000 mm.

The Sieve Masters are equipped with a maintenance free double eccentric motor which generates linear vibrations vertically to the screen surface.

The amplitude can be infinitely adjusted by re-positioning the eccentric weights on the motor when the machine is not in operation. The screen set is rigidly held on the vibrating table by the tensioning device, which can also be supplied as a lifting and tilting device. This lifting and tilting device makes emptying the screen boxes easier as it can be lifted by a hoist and the lowest box only requires tilting for emptying. Sieve Masters 500, 600 and 1000 can be used as vibrating tables without the screen set.

Manual Sieve Master 450AR

This version of the Sieve Master 450AR is configured for manual operation, and is surrounded by a soundproof enclosure to improve the work environment. It is controlled by a PLC which offers complete adjustment of the vibration amplitude as well as the shaking speed, duration, and direction.

It is suitable for a variety of different applications which require a heavy duty sieve shaker for screening medium volumes of samples including iron ore and coal.

The 450AR can be fitted with a range of different sieve types including 400 and 450 mm square, rectangular, or circular sieves. Up to eight 450mm square or rectangular sieves or up to ten 450 mm circular sieves can be used.

This offers the ultimate in sample screening flexibility as well as the option to process samples as and when they are required.
Automated Large Capacity Screen Shakers

These automated, heavy-duty sieve shakers are very similar to the manual versions, and are suitable for testing samples of up to 1 tonne. They are equipped with a hoist which acts as a tensioning device, and allows the screens to be lifted and tilted.

This makes lifting and tilting of the screens very user friendly and safe as only the bottom box requires tilting to be emptied. The Sieve Masters are equipped with a maintenance free double eccentric motor which generates linear vibrations vertically to the screen surface.

The amplitude can be infinitely adjusted by repositioning the eccentric weights on the motor when the machine is not in operation.

Laser Particle Size Analysis

This module is integrated into a linear system where particle size analysis is required. The module integrates into a robot automation or into a linear configuration as shown in the photo.

In this photo the system consists of an automated sample receiving station, automated particle size analyser, an automated pulverizer, and automated pelletizing press connected to an XRF and XRD.

Online Oversize Detection System

The OD (Oversize Detection) system features a camera with onboard ultra-fast processing power to analyse the product on the conveyor at a suitable point in the process. Illumination of the material enables the camera to capture crisp images of the product up to a rate of 75 fps (frames per second rate is dependent on the tools being utilized on the system).

The camera's image grabbing technology and inherent built-in intelligence performs accelerated inspections such as presence/absence, defect detection, shape analyses and many more real time functions.

The Oversize detection solution provides real time automated analysis of material size on the conveyor belt, with interface capability to almost any device or system.
Cyclosizer M16

The M16 Cyclosizer is a precise piece of laboratory apparatus for the rapid and accurate determination of particle size distribution within the sub sieve range.

Each machine is calibrated individually and typically separates at around 40, 30, 20, 15 and 11 microns respectively. The Cyclosizer has applications in many process industries associated with finely sized materials. (E.g. ore, coal, and ceramic processing). The operation of the Cyclosizer is very user friendly, with minimal operator skill required.

Particles are separated according to their Stokes equivalent diameter, with the fractions produced being specific gravity dependant. It is convention to express the sizings as quartz equivalents, but in reality, these sizings need to be corrected for variations in specific gravity. Corrections are calculated as part of the standard operating technique.

MYTIS At-line/On-line Particle Size Analysis

MYTIS offers at-line/on-line particle size analysis with laser diffraction, at a size range of 0.5 µm - 3500 µm

MYTIS is a unique combination of our established laser diffraction sensor with gentle dry dispersion by the built-in gravity disperser, optimised for at-line or on-line applications with sensitive or fragile dry particles.

MYTIS combines the technology of the well established laser diffraction sensor HELOS with the gentle dry gravity disperser GRADIS/L in a single robust instrument, specially designed for at-line or on-line applications in the process environment.

MYTIS can be directly operated with manual or automatic feeds, either via external robots or by delivering samples to the inlet hopper of the VIBRI/L-GMP dosing unit. Like HELOS it combines well proven techniques, particle sizing by laser diffraction in the parallel laser beam. A robust HeNe-laser is used as light source. In combination with patented spatial filter a nearly perfect plane wave is used for illumination of the particles.

The particles are fed at constant mass flow by the integrated dosing unit into the gravity disperser. Here, the particles are accelerated by the gravity of earth and gently dispersed by particle-to-particle and particle-to-wall collisions at impact plates of the fall shaft of the disperser.

The diffracted light is collected by the Fourier objective and imaged to the precision multi-element detector with 31 semi-circular elements. Auto-centering guarantees perfect optical alignment under all process conditions. The conversion of the intensity data to particle sizes in 31 size classes is performed by the powerful WINDOX software.
PICCELL On-line Particle Size and Shape Analysis

The PICCELL offers particle size and shape analysis with image processing of the highest order (2 µm - 5000 µm).

PICCELL (cover removed) is a unique combination of high speed image analysis with powerful wet dispersion optimised for on-line applications: up to 450 fps with 1024x1024 square pixels, 1 ns exposure time.

PICCELL combines the suspension flow cell of the LIXELL with the high speed image analysis of QICPIC in a single robust instrument, specially designed for on-line applications in the process environment.

PICCELL can directly operate in combination with the representative sampler family TWISTER, sampling probes, the MIXER or user supplied samplers.

Like QICPIC in combination with LIXELL it combines innovative new techniques: a family of powerful, high pressure (up to 10 bar) stainless steel (V4A) flow cells with gap of widths of 0.2, 0.5, 1, 2, 4 and 10 mm adapted to the size range; a pulsed light source with an extremely short exposure time of less than 1 ns which enables clear cut images from fastest particles created by the dispersion process (100m/s would result in only 100 nm of motion blur); a high speed camera suitable to measure up to 450 images per second for high statistical relevance of the measured results and short analysis times.

A built-in auto-focus aligns the flow cell along the optical axis for the optimum sharpness of the images.

PICTOS On-line Particle Size and Shape Analysis

PICTOS offers on-line particle size and shape analysis with image processing of the highest order - (5 µm - 3500 µm).

PICTOS is a unique combination of high speed image analysis with powerful dry dispersion optimised for on-line applications: up to 450 fps with 1024x1024 square pixels, 1 ns exposure time.

PICTOS combines the powerful dry dispersion of the RODOS with the high speed image analysis of QICPIC in a single robust instrument, specially designed for on-line applications in the process environment.

PICTOS can directly operate in combination with the representative sampler family TWISTER, sampling probes, the MIXER or user supplied samplers.

Like QICPIC it combines innovative new techniques: A powerful, well established dry dispersion unit, which guarantees proper dispersion of agglomerated fine and cohesive powders down to below 0.1µm; a pulsed light source with an extremely short exposure time of less than 1 ns which enables clear cut images from fastest particles created by the dispersion process (100m/s would result in only 100 nm of motion blur); a high speed camera suitable to measure up to 450 images per second for high statistical relevance of the measured results and short analysis times.
PICTIS At-line/on-line Particle Size and Shape Analysis

The PICTIS offers at-line/on-line particle size and shape analysis with image processing of the highest order - (5 µm - 10,000 µm).

PICTIS is a unique combination of high speed image analysis with gentle dry dispersion by the built-in gravity disperser, optimised for at-line or on-line applications with sensitive or fragile dry particles.

PICTIS combines the high speed image analysis of QICPIC with the gentle dry gravity disperser GRADIS/L in a single robust instrument, specially designed for at-line or on-line applications in the process environment.

PICTIS is directly operating with manual or automatic feeds, e.g. by external robots, delivering samples to the inlet hopper of the VIBRI/L-GMP dosing unit. The particles are fed at constant mass flow by the integrated dosing unit into the gravity disperser.

Here, the particles are accelerated by gravity of earth and gently dispersed by particle-to-particle and particle-to-wall collisions at impact plates of the fall shaft of the disperser.

Sieve Calibration and Measurement System

IMP sieve calibration and measurement system is an optical measurement system that can be used in the certification and re-certification of laboratory sieves to ensure that they comply with the relevant international testing standards.

This allows for the lifetime of sieves to be greatly extended since they are able to be fully utilised until they no longer meet specifications, rather than being discarded after an arbitrary period of time.

The machine automatically measures aperture size along with the wire thickness to determine whether or not the sieve is still up to standard. It is able to measure multiple apertures per second and can complete the scanning of a coarse sieve in approximately 2 minutes while fine mesh sieves take around 20 minutes to complete.

Results are exported to a fully customisable Excel data sheet and can be viewed in real time while the machine is running a scan.

The machine is very easy to use, with minimal operator training required for successful operation. The scan process is fully automated meaning that the operator is able to carry on with other tasks.

This forms part of the machines considerable cost savings for its operators, in that it requires minimal labour to operate and combined with the fact that sieves can be used for a much longer period of time before they are required to be replaced.