

DKSH – Your partner of choice for complete solutions in the metals, minerals and mining industry



Business Unit Technology

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DKSH is a leading provider of Market Expansion Services proficient across various industries. As a total solution provider and system integrator, we serve our customers as a one-stop-shop and provide customized technology solutions. We not only provide professional after-sales services, but also cover the entire life cycle including installation and commissioning, final acceptance, production start-up support, training, maintenance, repair, spare parts and consumables supply as well as trade-in. We operate as a trusted link between suppliers from Asia, Europe or America and customers in Asia, enabling suppliers to expand their markets.

Sales and service is our core competence. Our sales, application specialist and field service engineers are highly trained and dedicated to provide customers with complete and integrated laboratory solutions. Our industry specific expertise, in-depth process knowledge and complimentary product service portfolio enable us to provide total solutions to our customers' needs.

Market specific applications

With our profound market knowledge we are best positioned to serve our customers' needs. We provide products and services to the following industries across Malaysia.

Business Line Scientific Instrumentation

With a complete portfolio of instrument, general equipment, consumables, application and services, Scientific Instrumentation offers our customers total solutions that help solve complex challenges, improve results and increase productivity. Our solutions include the latest technological innovations to support universities, public and private research institutes, hospitals and industrial and commercial companies. Our solutions approach enables us to design, build, equip and service entire laboratories of our customers.

High performance and trustworthy process optimization partner

Through years of market research and exposure in the metals, minerals and mining industry, we are confident as a solution provider that meets the needs of our customers who operate in the highly demanding production sector and has laboratory advancement requirements.

Our solutions comprise of highly sophisticated and technological advanced features as

well as robust and safety assurance for our customers.

Our comprehensive range of instrumentation product, and highly skilled application and service support teams can assist you and your business in the following applications:

- Raw material exploration
- Material inspection and analysis
- Production and processing
- Laboratory advancement

We provide complete and integrated production, processing and laboratory solutions to:

- Ensure consistency of raw materials
- Qualify high performance of incoming materials
- Streamline quality control
- Reduce process downtime
- Optimize milling and granulation operations
- Improve manufacturing processes
- Increase productivity and yield
- Accelerate innovation and product development
- Depletion deduction on energy integrated with corporate social responsibility (CSR)

			
Aerospace	Automotive	Biotechnology and Life Sciences	Die and Mold
			
Healthcare and Hospital	Metals, Minerals and Mining	Oil and Petrochemicals	Pharmaceutical and Personal Care
			
Education and Academics	Food and Beverage	Semiconductor and Electronics	Chemical

High performance material and process optimization

Optimized processes at the processing plant are driven by the need to reduce energy consumption and increase margins. By combining robust and reliable systems, industry expertise and support, DKSH can assist you in improving efficiency throughout

the value chain of activities mining, ranging from raw materials exploration to final product development.

At DKSH Technology, we carry instruments that are innovatively designed to match

your needs across the mining processes. By partnering with DKSH, our instruments are capable of helping you reduce minerals extraction costs, milling product to the ideal grade size and energy efficiency in communication and separation circuits.

DKSH – Your partner for efficient production processes



- Enhance**
Operational quality and productivity of the entire facility
- Increase**
Staff satisfaction and productivity
- Reduce**
Operation cost
- Achieve**
Continuous improvement
- Meet**
Regulatory compliance
- Maximize**
Facility performance



Raw material exploration

Utilizing the latest technology, technical and scientifically proven methodology in product development, our instruments are

capable of detecting and identifying raw materials with unrivalled accuracies and reliability. These advantages makes raw

materials exploration efficient, accurate safety and profitable to the end users.

ASD TerraSpec Halo Mineral Identifier NIR Spectrometer

- Easy to use handheld instrument with state-of-the art mineral identification software for fast and easy data capturing
- Full Range NIR Spectrometer measuring visible and short wave infrared regions (350-2500 nm) that contributes to rapid mineral identifications
- Fast and accurate detection, performance can be improved with customized internal reference library

Applications:

Identification and characterization of raw minerals:

- Clays – Differentiate clay species such as kaolinites, illite/micas, smectites, chlorites
- Iron minerals such as hematite, goethite, garnets, and pyroxenes
- Carbonates
- Rare Earth Element (REE) minerals
- Ammonium minerals
- Chlorites and serpentines
- Sulfates



- Hydrous silicates such as opal, beryl, and zeolites
- Other hydroxyl-containing minerals such as amphiboles, epidotes, apatite, tourmalines, topaz, diaspore, and many of the arsenates

ASD TerraSpec 4 Hi-Res Mineral Analyzer Spectrometer

- Industry leading performance in the short-wave infrared, SWIR1/SWIR2 regions; enhanced in speed and precision data capturing
- Enhanced optical configuration for precise and superior spectral results, able to detect and measure samples with low concentration and low reflectance materials which were difficult to measure before
- Consistent spectral quality, contributes to precise and fast geologic exploration

- Fast field scans without sample preparation, faster data capture at exploration targets and drilling sites
- Unique Spectral Geologist Pro Mineral Analysis Software that accurately identifies key minerals and easy mineral data management

Applications:

- Geothermal
- Petroleum exploration
- Mining exploration



ASD FieldSpec4 Hi-Res Spectroradiometer

- Full range portable spectrometers which comes with VNIR and SWIR spectral ranges to deliver the fastest and most accurate spectral field measurements
- Precision measurements for wire array of remote sensing applications that helps reduce errors in scanning for about 10%
- Available in handheld; versatile and durable for accurate analysis in 325 to 1075 nm spectral range

Applications:

- Atmospheric research
- Ground truthing
- Spectroradiometry and radiometric
- Calibration
- Geology and mineral analysis
- Field spectrometry
- Hyperspectral remote sensing



Material inspection and analysis

Identifying conforming and nonconforming material is crucial at the inspection stage, which contributes to operational

performance and productivity. With the latest technology, optimizing material analysis process which can be monitored through

online will ensure this is critical for process control and provides guidance for quarry development.

Panalytical CNA Cross-belt Analyzer

- Designed for industrial environment deliver fast and accurate real time elemental analysis for cement, minerals,

- and coal industries with ultimate stability and safety features
- Readily interfaces with standard PLCs,

common process control and quality control software to enhance plant efficiency and save processing costs

CNA Pentos-cement Cross-belt Analyzer

- World’s most advanced online elemental analyzer for cement industry, using pulsed fast thermal neutron activation that quickly determines the chemistry of raw materials with accuracy at drastically improved signal-to-noise ratio
- CNA Manager user interface with built-in link diagnostics program with automated radiation protection system to prevent radiation risks

- Constant neutron flux eliminates expensive and inconvenient periodic on-site calibration, ensure consistent analysis
- Stable on-target kiln feed that promotes stability throughout the material characterization and analysis process



Applications:

- Quarry management
- Stockpile optimization
- Raw mix control

Sodern CNA Nickel online Elemental Analyzer

- For mining, CNA-Nickel enables control of nickel grade and moisture which allows for sorting and optimizes nickle core mining process
- Energy consumption is reduced by optimizing the dryer parameters in the pyrometallurgical process during extraction process
- Silica, iron or carbon additives adjustment

- is possible to prevent corrosion of the furnace lining when extracting nickle ore
- Reduce manpower and maintenance costs through the removal of the sampling tower

Applications:

- Nickle core mining
- Nickle core extraction



CNA³ Cross-belt Analyzer

- Designed for tough environment, such as underground mines with excellent life time and stable neutron output for high frequency elemental analysis
- No sampling is required as material is measured in real time on conveyor belt, promoting efficient material characterization
- Compact and unique design that is simple to install in most environment, can be easily removed for maintenance, cleaning, neutron generator swapping without

- with holding production
- Key parameters like crushing, magnetic separation and leach pile compositionquarry life are optimized to improve process stability and efficiency

Applications:

- Real time data on coal composition, calorific value, ash content, volatile matter and moisture
- Copper particle sizes



- Locate iron ore
- Nickel grade, Fe/Ni ratio, basicity index and others key parameters

Production and processing

We offer a diverse range of mineral processing solutions and technologies that improve process efficiencies and aid the economic extraction of valuable resources. Our solutions include consultancy and technical support focusing on

applications such as grinding, flotation, hydrometallurgy, solid liquid separation and materials handling. Our solutions, not only aim to reduce, but also optimize the cost of minerals extraction committing cost such as power and grinding media which

represent some of the largest costs in milling. The instruments and solutions we provide will help in the overall efficiency and process cost optimization.

Malvern Insitac Particle Size Analyzer

- Non-destructive measurement of samples enable their reuse in other analysis which provides cost-efficiency while also reducing waste production after analysis, reliability rate is guaranteed at >95%
- Particle measurement size range of 0.1 to 2500 um makes it suitable for the widest variety of process streams from dry powders to hot sticky slurries, sprays and emulsions, at-line or on-line
- Fully automated operation to reduce training requirements
- Detects irregularities and rectify upsets instantly to assist in preventing large-scale errors

Applications:
Milling, blending/homogenization, spray drying, granulation, emulsification, sedimentation and filtration.



Lauda Ultracool Industrial Chillers Ultracool Standard (ST) and Ultracool Superplus (SP)

- Customizable solutions applicable to various needs, resulting as increase in flexibility and productivity at the laboratories
- High consistency in temperature and and water quality control, resulting in low running costs which contributes to reduced manufacturing costs
- Highly durable and reliable solutions that can withstand harsh environments of the metal, mineral and mining industries
- Promotes safer working environment

Applications:
High frequency generators, resistance welding machines, lasers, central cooling systems, autoclaves, MRI scanners, vapor degreasing, digital printing, laser sorting and induction heating.



Jehmlich Universal Grinding Plant REKORD B

- Specially universal grinding plant designed with up to 5 different grinding elements for grinding different materials in construction material industry
- Adjustable mill speed with automatic speed limitation by detecting grinding elements
- Flexible process flow controlled by a screening machine, which also detect and determine grain size for determining process flow

Applications:
Construction materials grinding.



Laboratory advancement

Laboratory advancement consists of two major elements:

- Quality management including quality control (QC) and quality assurance (QA)
- R&D including material research and product/method development

Quality management systems are used in conjunction with quality improvement

activities to identify the causes of quality issues followed by developing strategies to eliminate these problems. It is an essential investment for the technology roadmap which is transformed into product development, process optimization and cost reduction. In industrial and technology sectors, R&D is a crucial component of innovation and one of the key factors in developing new competitive advantages.

DKSH ensures that both the elements are in good hands by providing not only a wide range of laboratory instruments, scientific equipment and consumables but also the knowledge base of our experienced applications specialists and a well-trained service support team.

PAnalytical Axios FAST Simultaneous XRF Spectrometer

- High sample throughput thanks to the continuous loading turret mechanism, which translates to fast sample handling and outstanding operational reliability
- Simultaneously measures up to 28 elements with a minimum of two seconds measurement per sample, promoting faster analysis while maintaining accuracy
- Robustly designed for critical analysis by commissioning protective coating, dust removal devices and externally mounted compact measurement chambers which

saves time and costs for maintenance, increasing instrument uptime

- Intuitive software interface which cater to both inexperienced and experienced user's requirement to maintain high volume sample analyses

Applications:

- Geological and commercial laboratories
- Production QC
- Iron and steel industry
- Analysis of iron samples



- Calibration of alloys (titanium, aluminium, and low alloys)

PAnalytical Epsilon 3X Benchtop EDXRF Spectrometers

- Cost efficient benchtop EDXRF spectrometers which reduces manufacturing costs while improving the mining process
- Compliant results for years without the need for time consuming re-calibration
- Combination of excellent detector resolution, high sensitivity that can measure C to Am range powerful software deconvolution models yields excellent

accuracy and precision results

Applications:

- Analyzes P, Cl, K, Ca, Mn, Fe, Cu and Zn in milk powder
- Allows analysis close to production lines
- Quantitative analysis of elements from sodium to Americium (Am) in material



like cement, proportion, mining, mineral, beneficiation, iron, steel, non-ferrous metals

Sherwood Scientific 410 Clinical Flame Photometer

- Directly measures Alkali and Alkaline Earth metals Sodium (Na), Potassium (K), Lithium (Li), Calcium (Ca), Barium (Ba), Caesium (Cs), Rubidium (Rb) and Strontium (Sr) by means of a low temperature flame using propane, butane or Natural gas
- Enable the user to determine alkali and alkaline earth metal concentrations in a wide variety of sample media

- Upgradable to fully integrated and automated systems which allows for operator-free and time-saving determination of metal ion concentration in composite materials

Applications:

The most sensitive and robust method for sodium, potassium, lithium and determination.



PANalytical Zetium X-ray Fluorescence Spectrometer

- SumXcore platform is the integration of WDXRF, EDXRF, and XRD technologies, which translates to task flexibility and analytical performance in multiple environments which reduce measurement time up to 50%
- Superior software that is simple, intuitive to use and configure, which translates to superior user experience due to shorter learning curve
- Robust quality with dust removal device and protective coating to minimize contamination and corrosion to maximize instrument uptime, which translates to higher output at workplace
- Cleverly compact design that puts space saving in mind, to reduce footprint at the workspace and easier to move for

maintenance or changing work stations

Applications:

Tailor-made edition of Zetium can be configured into several editions with a focusing in designated applications:

- The metal edition of Zetium Production control and R&D in metals, such as:
 - Iron, nickel and cobalt alloys, scrap metal, copper, aluminum and titanium alloys, iron and steel, soldering alloys, scrap metals
- The cement edition of Zetium
 - Analyze the composition of the raw material up to the final cement
 - Optimize the kiln throughput by using the analysis of free lime
 - Instrument analysis compliance with ASTM C 114 & ISO 29581-2 norm



- The minerals edition of Zetium deliver high performance major, minor and trace element quantification in geological materials such as: - Iron ore, base metals, bauxite and alumina, rare earth elements , phosphates, coal

PANalytical Empyrean XRD X-ray Diffractometer

- Inexpensive, reliable and useful solution in characterization of unknown materials which requires minimal sample preparation
- XRD analysis removes the need for slow, heavy man-power and operator dependent wet chemical techniques while the results produced are rapid and fast
- Technology is futureproof and multipurpose. Dedicated modules can be added to match increasing applications at multipurpose laboratory to keep up with changing research environment
- The maintenance free PIXcel X-ray diffractometer is designed to handle

measurements on powders, thin films, nanomaterials and solid objects with no compromise in data collection speed and consistency

Applications:

- Different amorphous phase determination in blended cements with Rietveld analysis
- Develop new crystal structure alloy material with high resolution crystallography
- Reveal mineralogical differences in heterogeneous samples using microspot analyses and phase distribution mapping
- Quantitative determination of retained



- austenite according to ASTM E975 for tool-steel Industry.
- Characterization of minerals such as ore which flotation of the raw ores is mineralogical dependent

PANalytical CubiX³ XRD X-ray Diffractometer

- The fastest industrial XRD that provides highest speed phase analysis for process optimization and quality control in the market that delivers remarkable analysis speed, reliability and reproducibility
- Robust design for harsh industrial environment, the goniometer, optics and detectors are dust-protected inside the enclosure to prevent unexpected downtimes
- User friendly interface control with fully automated XRD measurement and analysis that allows at any time access for adding new samples for rapid measurement which resulted in reduced costs

- Push button measurements that requires low learning curve which anyone with no knowledge of XRD can operate to achieve rapid measurement

Applications:

- Qualitative and quantitative analysis of minerals such as iron ores
- Characterization of Portland cement, clinker, gypsum, limestone, fly ash, blast furnace slag, aluminite cement and blended cement
- Perform electrolytic bath analysis of standard baths, crystallite size of carbon anodes, identification of alumina



- polymorphs and bauxites
- Phase quantification of direct reduced iron (DRI), calculation of Fetot, Femet, Ctot, Metn and determination of retained austenite in steel

Claisse M4 Fluxer Gas-fusion Instrument

- Three-position automated gas instrument with ready to use fusion programs that are customizable for the preparation of glass disks or borate and peroxide solutions for XRF, AA, and ICP analysis
- Efficient, high quality melt homogenization ensures different mined material samples are fusion heated in equal manner for guaranteed melting consistency and equally prepared samples
- Uniform heating, leading to reproducible results that saves operator time and prevents the need to repeat sample heating process
- Economical and low operation and maintenance costs allow for frequent operator use without incurring high costs
- Easy installation and operation with no training required allows the operator

to use the instrument right of the box for fusion heating of different mined material types

- No calibration required allows for immediate use after installation
- No need for compressed air/cooling systems to optimally run instrument allows uninterrupted operation and saves time
- Automated spark ignition for start-up and heat-up prior to use eliminates manual activation

Applications:

XRF, ICP, and AA analysis of mined materials including minerals, salts, metals, rocks, metal ores, slags and rare elements.



TheOx Fluxer Automatic Electric Multi-position Fluxer

- Six-position automated gas instrument that is designed for laboratories that ensures high productivity for the preparation of glass disks or borate and peroxide solutions for XRF, AA, and ICP analysis
- Wide range of mined material sample types provides the operator with different application options
- High-temperature setting for efficient fusion cycles of 24-30 fusions per hour that result in higher productivity that allows the operator for downstream analysis preparation of many samples
- Interface design allows the operator for control of heating rate to maximise the chance of oxidation and fusion success

rates for efficient and accurate generation of data that is reproducible

- Automated safety door locks provide enhanced safety for the operator to protect against high heat contact
- Highly durable design prevents fume build-up and eliminates the need for tedious cleaning during each use, and single electrical connection ensures simple instrument start-up

Applications:

XRF, ICP, and AA analysis of mined materials including minerals, salts, metals, rocks, metal ores, slags and rare elements.



Claisse LeNeo Fusion Instrument

- Fully automated instrument with ready to use 10 preset fusion programs that ensure high fusion success rate to prepare glass disks or borate and peroxide solutions for XRF, AA, and ICP analysis
- Automated safety door locks provide enhanced safety for the operator to protect against high heat contact

- Instrument is designed to eliminate overheating and the need for additional cooling system to maintain optimal operation temperature

Applications:

Fusion preparation of Mined materials - minerals, salts, metals, rocks, metal ores, slags, rare elements - for XRF, AA, and ICP analysis.



Malvern Mastersizer 3000 Laser Particle Size Analyzer

- Delivers particle size distributions from minute samples of fragile and cohesive dry mined material powders via wet dry dispersion that only requires low dispersant amounts ensures simple sample preparation
- Dry mined material powder particle analysis of sizes 10 nm to 3.5 mm provides the operator with a wide particle analysis range for different sample types

- Sophisticated and user-friendly OS with built-in programs ensure generation of efficient, reliable, and reproducible data for the operator and eliminates tediousness in data collection

Applications:
Particle size analysis of fragile and cohesive dry powder mined mineral samples via dry/wet dispersion method as part of quality control process in materials research.



Malvern Zetasizer Nano Zetasizer Range

- All-in-one analyzer for measuring molecule and particle characteristics, zeta potential, and microrheology of mined mineral powders via various light scattering techniques provide total analytical solutions to the operator while cutting costs
- Dry mined material powder particle analysis of sizes 0.3 nm to 100 µm provides the operator with a wide particle analysis range for different sample types

- 0°C to 90°C wet dispersion analysis temperature range of dry mined material powder provides the operator with proper analysis of samples for different applications

Applications:
Molecule and particle analysis of fragile and cohesive dry powder mined mineral samples and colloids via wet dispersion method as part of quality control process in materials research.



Morphologi G3 Particle Size and Particle Shape Image Analyzer

- Delivers automated particle characterization of fragile and robust mined material powders such as size and shape via static image analysis, which provides the operator with a visual character insight
- Eliminates the need to use costly, time consuming and tedious manual microscopes for particle characterization for fast image analysis of particle properties
- Mined material powder particle analysis of sizes 0.5 µm to several millimeters via dry dispersion provides the operator with a wide particle analysis range for different

- sample types
- Powerful, intuitive and responsive image analyzer software interface provides user-friendly visual and statistical analysis of data that ensures the operator efficient analysis of various samples

Applications:

- Materials R&D
- Troubleshooting applications throughout value chain in materials R&D
- Quality control analysis in materials R&D



LabPRO Balances

- Quick, easy and accurate right of the box operation to precisely measure a wide range of material solids, liquids, and powders up to 0.0001g readability to ensure accuracy of data recording
- Precise material measurement up to ±0.0001 (S.D) (mm) repeatability provide

stable readings that ensure reproducibility of data, saving time

Applications:
Used for quality control in materials R&D.



Hielscher Ultrasonic Laboratory Devices

- Handheld ultrasonic laboratory processors for a wide range of organic and inorganic materials that are easily powered on via 115/230 V outlets that eliminates the need for desktop space-consuming and costly ultrasonic processors
- Controllable amplitude percentage dial ensures reliability and reproducibility of data by preventing sudden changes in amplitude percentage and without the need to re-adjust the dial
- Adaptable for low and high sample volume applications ranging from 50 µL to 2000 mL that eliminates the need to acquire multiple ultrasonic laboratory processors

Applications:
Homogenizing, dispersing and disaggregation, and particle size reduction of mined material



powders, and the acceleration of chemical reactions (sonochemistry) in materials R&D.

Lauda Capillary Viscometers

- Precisely positioned NIR permeable ring marks prevent inaccurate sample detection and allow for uniform automatic measuring systems that ensure reliability of obtained data
- Corrosion resistant labelling when using aggressive solvent samples/cleaning agents circumvent flow type constraints and allows for a wide range of materials to be measured
- Offers viscosity level detections between 0.3 and 30,000 mm²/s for a wide range of flow types that save cost in owning multiple viscometers
- Adaptable operating software for different applications eliminates need to own additional software tools for measuring different flow types

Applications:
Identification of kinematic and dynamic viscosity of flow material in materials R&D.



Lauda Circulator Chiller

- Closed cooler circuit increases air/water cooling efficiency that allows 24/7 operation of application that saves time and cost needed for application maintenance
- Effective removal of excess heat that maintains optimum application operating temperature and performance that eliminates the need for constant manual decrease of chiller temperature
- Large LED display and user-friendly interface allows the operator to easily navigate through the operating system for quick setting adjustments and straight use
- USB connections and safety alarm system allow convenient transfer of data for maintenance record and analysis purposes that ensure continuous tip-top equipment operation

Applications:
Process control in materials R&D.



Surface Measurement Systems Dynamic Vapor Sorption Analyzer

- World leaders in water/vapor sorption (humidity) technology in measuring physico-chemical characterisation using kinetics sorption systems
- High sensitivity using small samples. Safe in wide range of vapors (water and solvent)
- Designed to study water sorption and operate at a wide temperature range from 5 to 85°C. It will also offer a wide-range of options, including high resolution video (5 megapixels) and Raman amongst other features

Applications:
Water Activity (Aw) measurement to determine kinetics of moisture (drying and dehydration) behaviour, stability, shelf life prediction.



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