SCAS SINGAPORE PTE LTD

Established : November 1997
Capital : S$2 million
Shareholder : 100% owned by Sumika Chemical Analysis Service, Ltd.

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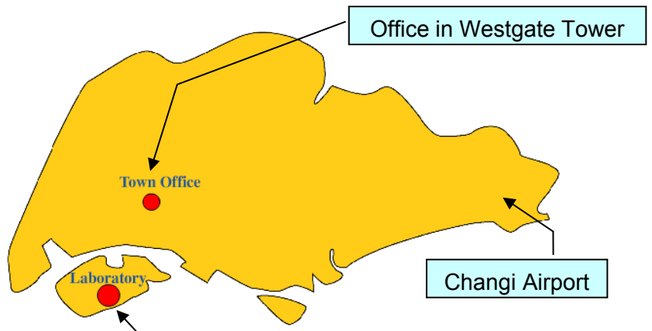
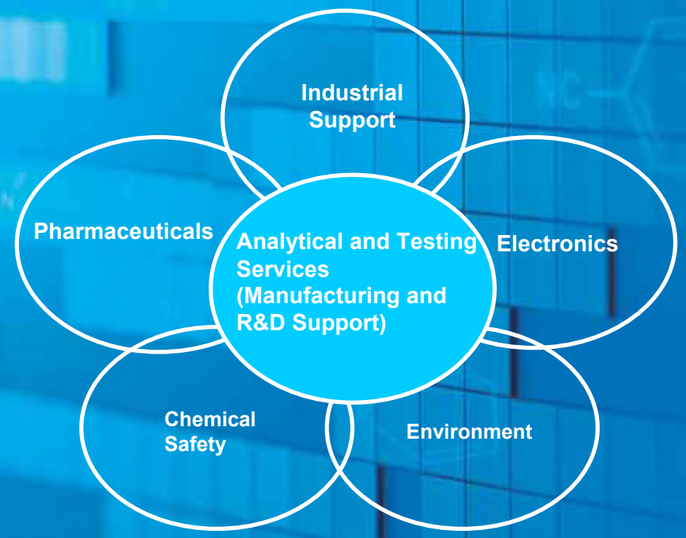


SCAS GROUP

In determined pursuit of its global strategy, the SCAS Group has expanded beyond Japan's borders, establishing its first overseas base in Singapore in 1997, followed by bases in Shanghai and Belgium in 2007, and more recently in South Korea in 2011. Our Group offers an extensive range of services that can meet the rapidly expanding demand for analysis services.

SCASS Sumika Chemical Analysis Service Singapore
SCAS SINGAPORE PTE LTD



SCAS SINGAPORE PTE LTD

ACCREDITED LABORATORY SAC-SINGLAS

Our corporate slogan

Analysis is at the core of all developments made by modern civilization.
Utilizing our state-of-the-art analytical technology, we will contribute to the creation of a bright future for both individuals and society as a whole

SCASS was founded in Singapore in 1997. SCASS's aims are to use the experience and knowledge it has built up since its beginnings to provide sophisticated analysis services and to deliver analysis outcomes that meet our clients' satisfaction.

SCASS is accredited under the Singapore Accreditation Council's Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) to perform Chemical and Biological Analyses and analyses in the field of Environmental testing.

SCASS provides many different high-quality analysis services, including chemical raw material analysis, foreign matter analysis, VOC outgassing analysis, and cleanliness and contamination troubleshooting for HDD components.

General Chemical Raw Materials and Products

1. High-polymer material testing
[E.g.] Sheet edge color, volatile matter content, powder content, vicat softening point, reduced viscosity, melt flow index, bulk density, residual monomers

2. General chemical product analysis
[E.g.] Appearance, purity, color, specific gravity, acidity, distillation testing, water content, organic impurities, metallic impurities, inhibitor concentrations

3. Determination of organic and inorganic compounds
1) Composition analysis using GC and HPLC
2) Qualitative analysis using FT-IR and GC-MS
3) Foreign matter analysis using FT-IR, SEM-EDX and ICP-AES

Electronic Industrial and Electronic Components

1. Outgassing analysis using DHS/GC-MS
1) Organic compounds:
[E.g.] Hydrocarbons, phthalic esters (DOP, DBP), acrylic esters
2) Silicon compounds (e.g. siloxane)

2. Ion chromatography (IC) analysis
1) Anions: [E.g.] F^-, Cl^-, Br^-, NO_3^-, PO_4^{3-}, SO_4^{2-}
2) Cations: [E.g.] Li^+, Na^+, K^+, Mg^{2+}, Ca^{2+}, NH_4^+

3. Evaluations of clean room supplies
[E.g.] Organic substances, siloxane, fine particles, talc.

Environment and Water Business

1. Wastewater analysis
1) Analysis for [e.g.] pH, color, COD_{Cr}, BOD, SS, TDS, TOC, grease & oil, turbidity, conductivity
2) [E.g.] All metals, nitrogen, phosphorus, H_2S, cyanide, Cl^-, NO_3^-, SO_4^{2-}, PO_4^{3-}, NH_4^+

2. Water analysis
1) Measurement of monoamines in cooling water
2) Analysis of raw water and treated water cleanliness, and for concentrations of harmful substances

3. Testing of activated sludge: MLVSS and MLSS

4. Analysis of filter deposits

Affiliated SCAS Group Support

1. Evaluations of general chemical products, electronic industrial products, and devices
1) Structural analysis using e.g. NMR and micro-raman spectroscopy
2) Outgassing analysis using WTD-GC/MS
3) Surface analysis using e.g. AES, XPS, TOF-SIMS and EPMA
4) Chemical contamination analysis for e.g. clean rooms

2. Environmental evaluations
1) Environmental compliance evaluations (e.g. RoHs, REACH testing)
2) Analysis for evaluations of foods

3. Registration applications and hazard assessment
New chemical substance applications (for e.g. REACH, and for all types of chemical products) for Asian ountries, China, Japan, Europe, USA, and so on

4. Instrument sales
1) Total carbon combustion instruments, and total nitrogen analyzers (SUMIGRAPH)
2) HPLC columns (SUMIPAX, SUMICHIRAL)

Contact us at:

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Analysis of Raw Materials, Chemical Products, Organic & Inorganic Elements

Organic element analysis **Analysis of high-polymer material purity and impurities; analysis for additives; analysis of organic constituents in gases. SCASS uses GC-MS and HPLC to perform qualitative and quantitative analyses.**

Inorganic element analysis **SCASS uses ICP-AES to perform qualitative and quantitative analyses of inorganic elements. Our advanced knowledge and extensive experience allow us to organize accurate preprocessing and measurement conditions to deliver the data that our clients need.**

GC-MS

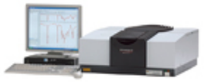
HPLC

ICP—AES

Foreign Matter Analysis and Microstructural Observation

Foreign matter analysis is an extremely important feature of the manufacturing process. SCASS uses micro-FTIR spectroscopy and the high-resolution SEM-EDX scanning electron microscope for its fine foreign matter analyses.

Our microstructural observations of surfaces and cross-sections can assist our clients with their R&D and resolution of issues.



Micro-FTIR

SEM-EDX

Organic constituents	Micro-FTIR	Micro-raman (for comparison)
Analysis method	Mid-infrared laser (4000～400cm-1)	Visible laser (532nm)
Information	Functional group information [E.g.] C=O, C-O, C-H (Effective on combinations using different elements)	Functional group information [E.g.] C-C, C=C (Effective on combinations using the same elements)
Measurable size	＞10um	＞1um
Qualitative analysis	○	△
Other features	・Sampling required (sampling of foreign matter) ・Employs many measurement methods, including the transmission method and the reflection method ・Not good with black-colored materials ・Cannot measure samples in glass bottles or aqueous solutions ・Extensive databases make analyses easy	・Cannot measure fluorescent materials ・Employing its confocal microscopy function, can also measure buried samples (eliminating the need for preprocessing) ・Thermal damage from the laser is a possibility ・Its small number of databases makes analyses difficult

Inorganic constituents	SEM-EDX	EPMA (WDX) (for comparison)
Analysis method	Energy-dispersive	Wavelength-dispersive
Information	Carbon ～ uranium	Boron ～ Uranium
Measurable size	＜1um measurable	1～100um
Qualitative and semi-quantitative analysis	△	○
Other features	Mainly observation	Mapping possible