

PRODUCT QUALITY ASSURANCE SOLUTIONS

SYFT TECHNOLOGIES

syft[™]
Technologies

SIFT-MS SOLUTIONS THAT ASSURE PRODUCT QUALITY

The unintentional presence of volatile and/or semivolatile organic compounds (VOCs and SVOCs) can significantly impact the quality of certain products, including semiconductors, food products, and pharmaceuticals. These quality issues can result in product losses, shortened product life, and brand damage.

Selected ion flow tube mass spectrometry (SIFT-MS) is a robust analytical technique that can address these issues. It can quantify VOCs and SVOCs in real time, at the required concentrations, so that issues are detected on-line in real time and can be dealt with immediately. This offers economic benefits through reduced product losses in the factory, plus adds an additional layer of protection from

shipping or use of faulty product. Syft Technologies' SIFT-MS instruments also deliver benefits in ease of use, ease of integration, remote operation and long-term calibration stability.

This brochure outlines several SIFT-MS-based quality assurance solutions provided by Syft Technologies.

SEMICONDUCTOR, PHOTOVOLTAIC AND LCD/LED MANUFACTURE

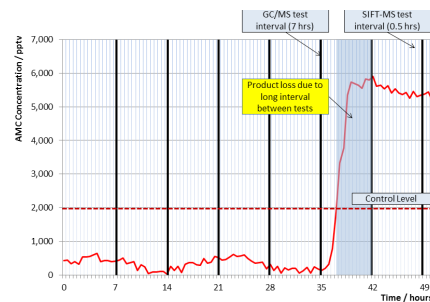
Successful fabrication of semiconductors, photovoltaics and LCD/LED panels utilizes extremely high-precision manufacturing equipment in an ultraclean environment. Volatile or semivolatile contaminants in air can degrade semiconductor performance, increase the frequency of expensive maintenance, or shorten the operational service of fabrication equipment.

The SIFT-MS technique provides rapid, high-sensitivity analysis of air for the majority of compounds that are important in the semiconductor and

related industries, greatly reducing product loss and equipment failure.

Applications of SIFT-MS in the semiconductor industry include:

- 24/7 monitoring of cleanroom air (including multipoint sampling options).
- 24/7 monitoring of ambient air (before and after filtration).
- Targeted monitoring of 'hotspots'.



Applying SIFT-MS in a multiple-point sampling scenario can prevent hours of production losses due to more rapid analysis.

SCREENING FOR TAINT CHEMICALS

Shipping containers are used to transport a huge variety of goods, including chemicals, industrial equipment, household items and food products. While this versatility benefits shipping companies, it introduces a significant and unquantified risk to companies that pack containers with sensitive consumer products, such as foodstuffs, pharmaceuticals, and personal care products.

Syft Technologies offers unique, cutting-edge solutions that allow companies to reduce the risk of using containers that are contaminated with taint

compounds, such as tribromoanisole (TBA) and dichlorophenol (DCP).

Applications include:

- Enhanced container surveys at the depot to identify and remove tainted containers from the supply chain.
- Quality control of incoming empty containers at the pack point or distribution center.
- Quality assurance of incoming product at unloading point.

Scan Results voice200®

Container Swab Analysis ⚠️

ID 2144 11-26 13:55

Warning!

The following compounds detected:

Dichlorophenol

Next

Scan Results voice200®

Container Swab Analysis ✅

ID 2143 11-26 13:40

All target compounds are below reporting threshold

Next

Simple pass/fail reporting of tainted or untainted shipping containers.

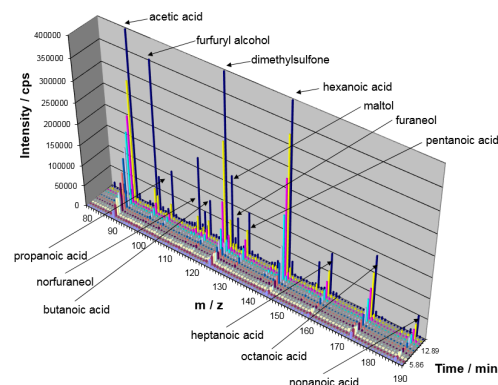
PROCESS-LINE QUALITY ASSURANCE OF SPRAY DRIED AND BAKED FOOD PRODUCTS

Raw materials for the food processing industry usually show seasonal and other quality variations. When coupled with changes in the performance of processing equipment, product quality may vary. Since aroma is derived from VOCs and is a key component of consumer perception of the product, best results are obtained by monitoring the product during processing.

Syft Technologies' SIFT-MS instruments are ideal process-line monitors for sensitive detection and quantitation of both oxidation and Maillard reaction products that indicate the degree of processing and the product quality.

Benefits of applying SIFT-MS on the food processing line include:

- Rapid quality assurance of incoming raw materials to eliminate losses caused by their use.
- Optimization of formation of favorable aroma compounds that aid consumer acceptance and mask unfavorable oxidation aromas formed during ageing.
- Reduction of product losses due to formation of unfavorable aromas (such as rancidity).



Detection of oxidation and browning products in skim milk powder as the temperature is increased from 80 to 150°C.

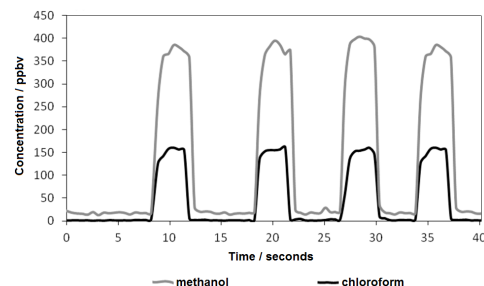
RAPID RESIDUAL SOLVENT SCREENING IN THE PHARMACEUTICAL INDUSTRY

A wide variety of solvents are used during manufacture of pharmaceuticals, but regulations strictly control permissible concentrations in the finished product. SIFT-MS provides a very rapid and highly sensitive solution for the detection of VOC residues in the pharmaceuticals and packaging, which are not easily detected by other technologies.

Benefits of SIFT-MS include:

- Direct analysis through elimination of chromatographic separation, making it ideal for detection of volatile solvents, including continuously monitoring.

- Very high throughput screening coupled with high sensitivity provides rapid warning of quality issues and greatly reduces the test cost per analysis.
- Wide linear and dynamic ranges enable one instrument to be applied to multiple analytical tasks.
- High selectivity provided by three rapidly switchable reagent ions: H_3O^+ , NO^+ , and O_2^+ .



Rapid analysis for residual solvents using SIFT-MS

SUMMARY

Syft Technologies SIFT-MS instruments offer unparalleled opportunities for highly sensitive, selective, and non-discriminatory VOC and SVOC analysis in diverse industrial applications, including semiconductor fabrication, food manufacturing, and pharmaceuticals.

By delivering real-time results, Syft instruments provide a unique opportunity for on-line product quality decisions to be made, which reduce the risks of product loss and brand damage.

Syft Technologies is committed to its customers' success, delivering user-

friendly software, product reliability and full after-sales support. Syft's instruments are user friendly and easily integrated with existing infrastructure.

SELECTED ION FLOW TUBE MASS SPECTROMETRY (SIFT-MS)

SIFT-MS is the leading real-time analytical technique for comprehensive gas analysis to ultra-trace levels.

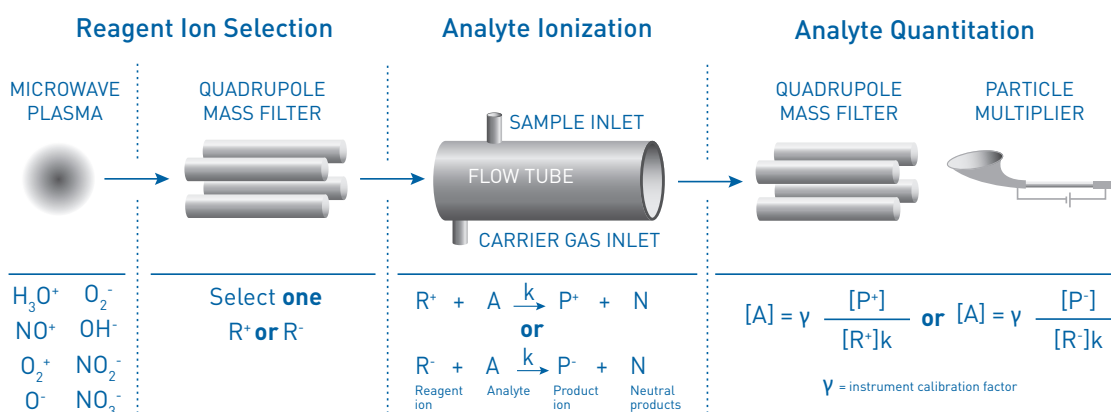
SIFT-MS uses ultra-soft, precisely controlled chemical ionization coupled with mass spectrometric detection to rapidly quantify VOCs and permanent gases to low part-per-trillion concentrations by volume (pptv). Eight

chemical ionization agents (reagent ions) are applied in Syft instruments: H_3O^+ , NO^+ , O_2^+ , O^- , O_2^- , OH^- , NO_2^- , and NO_3^- .

These eight reagent ions react with VOCs and inorganic gases in very well controlled ion-molecule reactions but they do not react with the major components of air (N_2 , O_2 , and Ar). This enables SIFT-MS to

analyze air at trace and ultra-trace levels without preconcentration.

Rapid switching of eight reagent ions provides unsurpassed selectivity among direct MS techniques.



BENEFITS OF SYFT SIFT-MS INSTRUMENTS

- Instantaneous identification and quantitation of VOCs and inorganic gases using a fully integrated, extensive chemical ionization library
- Real-time air analysis to low part-per-trillion by volume (pptv) concentrations with class-leading selectivity, no preconcentration, and high robustness to humidity
- Analysis of chemically diverse VOCs in a single analysis (e.g. aldehydes, amines and organosulfur compounds)
- Ease of operation with pushbutton simplicity (including smartphone access), no sample preparation, and comprehensive LabSyft data analysis software
- Designed and engineered for use in commercial, industrial and research environments, with easy integration into sample delivery systems and IT infrastructure
- Reliable, low maintenance instruments and accessories, with market-leading aftersales support

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