

LABORATORY FTIR / DATA SHEET
SF500Z

Fourier Transform Infrared Spectrometer

A digitally monitored FTIR platform engineered for dependable identification, quality control and research workflows.

Designed for confident routine analysis

SF500Z combines DSP-controlled interferometry, high-sensitivity DLATGS detection and direct temperature/humidity monitoring in a compact 14 kg platform.

- DSP-controlled non-orthogonal Michelson interferometer
- Digital temperature/humidity display with alarm
- Fully sealed cavity and quick-change desiccant
- Transmission, ATR and reflection accessories



450 × 350 × 210 mm
DIMENSIONS

14 kg
WEIGHT

< 30 W
NORMAL POWER

7800–350
SPECTRAL RANGE,
CM⁻¹

Key Advantages

- DSP-controlled interferometry with continuous dynamic adjustment.
- Direct digital temperature/humidity monitoring with humidity alarm.
- Fully sealed optical cavity with reusable 304 stainless-steel desiccant.
- Transmission, ATR and diffuse/specular/external reflection expansion.

Application Scenarios

- Pharmaceutical, polymer and petrochemical analysis.
- Oil, food, materials and semiconductor workflows.
- Research, qualitative analysis and routine QA/QC.
- Material identification across solids, powders, liquids and surfaces.

MEASUREMENT PRINCIPLE

FTIR Platform

SF500Z combines DSP-controlled interferometry, a fully sealed optical cavity, digital temperature/humidity monitoring and guided software for dependable routine and research analysis.

01 Ceramic source	02 DSP interferometer	03 Sample / accessory	04 DLATGS detector	05 Fourier transform
-----------------------------	------------------------------------	---------------------------------	------------------------------	--------------------------------

Engineered for stability, energy efficiency and easy maintenance
01 DSP-controlled interferometer

A modified non-orthogonal Michelson interferometer uses DSP-controlled electromagnetic drive, continuous dynamic adjustment and automatic energy optimization.

02 Permanent optical alignment

A fixed three-dimensional right-angle gold-coated compensation mirror avoids routine mechanical adjustment and supports lasting collimation.

03 Digital environment monitor An industrial-grade temperature/humidity module provides direct digital readout and humidity alarm for clear optical-cavity status awareness.	04 Sealed cavity & desiccant The fully sealed optical cavity and reusable 304 stainless-steel boxed desiccant help manage moisture; the desiccant is accessible without removing the cover.
05 Full-digital electronics Full-digital architecture, 24-bit 500 kHz A/D conversion and USB connectivity support efficient real-time spectral acquisition.	06 Flexible expansion The large sliding-door chamber supports transmission, ATR, diffuse-reflection, specular-reflection and external-reflection accessories.

Bench-ready system at a glance

24-bit A/D CONVERSION	500 kHz SAMPLING ELECTRONICS	T / RH DIGITAL MONITORING	< 30 W TYPICAL POWER
---------------------------------	---	-------------------------------------	-----------------------------------

TECHNICAL SPECIFICATIONS

Performance Data

The following specifications are compiled from the supplied SF500Z technical document. Configuration-specific values should be confirmed at quotation.

Optical performance

Item	Specification
Spectral range	7800–350 cm ⁻¹ (approx. 1.28–28.57 μm)
Spectral resolution	Better than 1.0 cm ⁻¹
Wavenumber precision	≤ 0.01 cm ⁻¹
Signal-to-noise ratio	Better than 30,000:1 (peak-to-peak, 4 cm ⁻¹ , 1-minute acquisition)
Interferometer	Modified non-orthogonal Michelson; DSP-controlled electromagnetic drive with continuous dynamic adjustment
Optical alignment	Fixed three-dimensional right-angle gold-coated compensation mirror; no routine mechanical adjustment
Beam splitter	Germanium-coated KBr substrate with moisture protection
Detector	High-sensitivity DLATGS detector with moisture barrier
Infrared source	High-energy, high-efficiency, long-life ceramic source

System and electrical

Item	Specification
Digital electronics	Full-digital architecture; 24-bit, 500 kHz A/D conversion
Environment monitor	Industrial-grade digital temperature/humidity display with humidity alarm
Moisture management	Fully sealed cavity; reusable 304 stainless-steel boxed desiccant with quick external access
Data interface	USB 2.0; compatible with USB 3.0 host ports

Item	Specification
Sample chamber	Large sliding-door compartment; supports transmission, ATR and reflection accessories
Power consumption	Less than 30 W during normal operation
Input power	100–240 VAC, 50/60 Hz
Dimensions (W × D × H)	450 × 350 × 210 mm
Weight	14 kg
Software platform	Windows PC; supported operating-system versions depend on software release

Recommended environment

Item	Specification
Laboratory	Dry, clean, well ventilated and well sealed; protect the instrument from direct sunlight and dust
Humidity control	Use the built-in temperature/humidity display and humidity alarm; provide dehumidification as needed
Electrical	Stable, grounded 100–240 VAC, 50/60 Hz supply
Sample area	Keep the sample chamber, optical windows and accessories clean and dry
Long-term storage	Keep the optical cavity sealed and maintain the reusable desiccant in serviceable condition

CONFIGURATION NOTE

Beam splitter, spectral libraries, sampling accessories and current software / OS compatibility are configuration dependent. Confirm the ordered configuration before purchase.

Configuration options

Option	Source-supported content
Beam splitters	KBr, ZnSe and CaF ₂ configurations
ATR sampling	Direct measurement of solids, liquids and surfaces
Reflection kits	Diffuse, specular and external-reflection accessories
Library packages	Industry-specific reference spectra

SOFTWARE AND DATA

Intelligent Workflow

From acquisition to confident identification

The infrared workstation combines guided acquisition, spectrum processing, library search, QC/QA comparison and reporting in a unified workflow.

Live acquisition preview

Preview spectra in real time while monitoring instrument status and the built-in temperature/humidity display.

1 Acquire and monitor Guided acquisition, real-time spectrum preview, instrument-state display and temperature/humidity awareness support a clear measurement workflow.	2 Process and interpret Integrated data acquisition, spectrum processing, peak annotation and interpretation tools help turn measured spectra into usable results.
3 Search and compare Search supplied or user-defined libraries, perform QC/QA comparison and use high-sensitivity correlation matching for identification.	4 Report and exchange Generate complete reports, maintain electronic laboratory records and exchange JCAMP or compatible third-party spectral formats.

Spectral libraries and data exchange

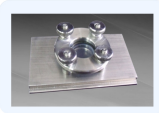
Capability	Source-supported content
Standard library	Approximately 1,800 standard reference spectra
Professional library	Approximately 220,000 optional professional spectra
Common data formats	JCAMP and compatible third-party spectral formats
Library coverage	Pharmaceutical, polymer, rubber, gas, forensic, inorganic, organic, solvent, food-additive, flavor/fragrance and coating applications; user-defined libraries supported
Software compatibility	Library availability and data-format compatibility depend on the licensed software package

SAMPLING AND APPLICATIONS

Flexible Configuration

Three practical routes from sample to spectrum

Configure SF500Z for classic transmission methods or rapid ATR measurements across solids, powders, liquids, films, coatings and polymers.

		
KBr pellet transmission POWDERS AND SOLIDS Grind approx. 1 mg of dry sample with approx. 200 mg of dry spectroscopic-grade KBr; press at about 15 MPa for 30–60 seconds, then measure the transparent or translucent pellet.	Demountable liquid cell FLOWING AND LOW-VISCOSITY LIQUIDS Place a drop between compatible infrared windows with the required spacer, assemble gradually and measure. Clean the windows with a suitable solvent immediately after use and protect them from moisture.	ATR measurement SOLIDS, POWDERS, LIQUIDS AND SURFACES Place the sample in firm contact with the ATR crystal and acquire directly. ATR reduces preparation effort for difficult-to-grind, insoluble or non-destructive surface measurements.

Representative application areas

Pharmaceuticals, polymers, petrochemicals, oils, food, materials, semiconductors and research, including drug identity testing, plastic and resin identification, asphalt and fuel analysis, oil analysis, food authenticity, coatings and glass, silicon-crystal analysis, molecular structure and routine QA/QC.

VERIFICATION AND INSTALLATION

Documented Performance

Performance verification and lab guidance

The supplied source document includes peak-position checks and operating recommendations. The values below are reproduced as representative verification data, not as an individual instrument certificate.

Peak-position verification

Acceptance band	Reference peak	Measured peak	Deviation	Result
$\leq \pm 5 \text{ cm}^{-1}$	3027 cm^{-1}	3026.49 cm^{-1}	-0.51 cm^{-1}	Pass
$\leq \pm 5 \text{ cm}^{-1}$	2851 cm^{-1}	2850.44 cm^{-1}	-0.56 cm^{-1}	Pass
$\leq \pm 1 \text{ cm}^{-1}$	1601 cm^{-1}	1601.17 cm^{-1}	$+0.17 \text{ cm}^{-1}$	Pass
$\leq \pm 1 \text{ cm}^{-1}$	1028 cm^{-1}	1028.63 cm^{-1}	$+0.63 \text{ cm}^{-1}$	Pass
$\leq \pm 1 \text{ cm}^{-1}$	907 cm^{-1}	906.93 cm^{-1}	-0.07 cm^{-1}	Pass

RESOLUTION CHECK

The supplied verification document reports that seven peaks in the $3110\text{--}2850 \text{ cm}^{-1}$ region were clearly resolved. SF500Z is specified at better than 1.0 cm^{-1} spectral resolution.

Installation and care

Laboratory setup • Use a dry, ventilated, clean room with good door and window sealing. • Protect the instrument from direct sunlight, dust and corrosive vapors. • Provide air conditioning and dehumidification according to local conditions. • Use a grounded 100–240 VAC, 50/60 Hz supply.	Moisture management • Observe the digital temperature/humidity display routinely and respond to humidity alarms. • Keep the sample chamber and accessories clean and dry. • Regenerate or replace the reusable stainless-steel desiccant before it is exhausted. • Store the instrument sealed if it will be idle for an extended period.	Routine care • Use trained personnel and follow the operating manual. • Clean KBr windows, ATR crystals and sample tools promptly after measurement. • If unused, power the system at least weekly for not less than two hours. • Contact technical support if abnormal performance is observed.
---	---	--

CONTACT / SUPPORT

SpeSense Technologies Inc.

Add: No. 9 Yuhe Road, Guitang Subdistrict, Yuhua District, Changsha City

Tel: +86-15386478166

Email: info@spesense.com

Web: www.spesense.com



WhatsApp / WeChat