LABORATORY FTIR / DATA SHEET

# SF700Z

# Fourier Transform Infrared Spectrometer

A high-energy, dynamically aligned FTIR platform engineered for dependable identification, advanced sampling and research workflows.

## Designed for confident routine analysis

SF700Z combines a 24 W stabilized infrared source, four-quadrant dynamic collimation, high-sensitivity DLATGS detection and direct temperature/humidity monitoring.

- DSP-controlled non-orthogonal Michelson interferometer
- Four-quadrant dynamic collimation technology
- Digital temperature/humidity display with alarm
- ATR, reflection and infrared-microscope expansion


| 520 × 430 × 250 mm | 19 kg | < 30 W | 7800–350 |
|---|---|---|---|
| DIMENSIONS | WEIGHT | NORMAL POWER | SPECTRAL RANGE, $CM^{-1}$ |

## Key Advantages

- DSP-controlled dynamic alignment supports optical stability and energy optimization.
- 24 W stabilized SiC source provides strong energy for demanding workflows.
- Sealed cavity and reusable 304 stainless-steel desiccant manage moisture.
- Flexible chamber supports transmission, ATR, reflection and microscopy accessories.

## Application Scenarios

- Biopharma, materials science and petrochemical analysis.
- Food safety, environmental and polymer workflows.
- Coatings, surfaces, teaching and research.
- Identification across solids, powders, liquids and surfaces.

MEASUREMENT PRINCIPLE

# FTIR Platform

SF700Z combines DSP-controlled interferometry, four-quadrant dynamic collimation, a fully sealed optical cavity and guided software for dependable routine, industrial and research analysis.

| 01 | 02 | 03 | 04 | 05 |
|---|---|---|---|---|
| 24 W SiC source | DSP interferometer | Sample / accessory | DLATGS detector | 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 Dynamic four-quadrant collimation

Laser-based four-quadrant alignment compensates moving-mirror mechanical deviation and optical errors caused by gravity or temperature change.

### 03 High-energy infrared source
A 24 W electronically stabilized silicon-carbide source and internal reflector provide strong energy for ATR and infrared-microscopy applications.

### 04 Sealed cavity & desiccant
The sealed optical platform and reusable 304 stainless-steel boxed desiccant manage moisture; the desiccant is accessible without removing the cover.

### 05 Digital environment monitor
An industrial-grade temperature/humidity module provides direct digital readout and a humidity alarm for clear cavity-status awareness.

### 06 Flexible expansion
The large sample chamber supports transmission, ATR, diffuse, planar and external reflection, plus infrared-microscope expansion.

## Bench-ready system at a glance

| 24-bit | 500 kHz | 24 W | < 30 W |
|---|---|---|---|
| A/D CONVERSION | SAMPLING ELECTRONICS | STABILIZED IR SOURCE | TYPICAL POWER |

TECHNICAL SPECIFICATIONS

# Performance Data

*The following specifications are compiled from the supplied SF700Z 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 0.85 $cm^{-1}$; 0.5 $cm^{-1}$ optional |
| **Wavenumber precision** | ≤ 0.01 $cm^{-1}$ |
| **Signal-to-noise ratio** | Better than 45,000:1 (peak-to-peak, 4 $cm^{-1}$, 1-minute acquisition) |
| **Interferometer** | Modified non-orthogonal Michelson; DSP-controlled electromagnetic drive with continuous dynamic adjustment |
| **Optical alignment** | Four-quadrant dynamic collimation with high-reflectivity gold-coated corner-reflector optics |
| **Beam splitter** | Imported germanium-coated KBr substrate with anti-fog moisture protection |
| **Detector** | Imported high-sensitivity DLATGS detector with moisture barrier |
| **Infrared source** | Imported 24 W electronically stabilized, high-power silicon-carbide rod source |

## System and electrical

| Item | Specification |
|---|---|
| **Laser system** | Imported low-power VCSEL, bandwidth better than 1 nm; high-stability He-Ne option |
| **Digital electronics** | SuperTect full-digital architecture; 24-bit, up to 500 kHz A/D conversion |
| **Environment monitor** | Industrial-grade digital temperature/humidity display with humidity alarm |

| Item | Specification |
|---|---|
| **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 |
| **Sample chamber** | Large sliding-door compartment; supports transmission, ATR, reflection and microscopy accessories |
| **Power consumption** | Less than 30 W during normal operation |
| **Input power** | 100–240 VAC, 50/60 Hz |
| **Dimensions / weight** | 520 × 430 × 250 mm / 19 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 configuration |
|---|---|
| **Resolution** | 0.5 $cm^{-1}$ high-resolution configuration |
| **Protected optics** | KRS-5 and ZnSe moisture-resistant material configurations |
| **Sampling accessories** | ATR plus diffuse, planar and external reflection |
| **Infrared microscopy** | Microscope expansion for localized analysis |

**SOFTWARE AND DATA**

# Intelligent Workflow

## From acquisition to confident identification

The infrared workstation combines guided acquisition, full-process preview, spectrum processing, multi-mode library search and reporting in one approachable workflow.

### Live acquisition preview

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

| | |
|---|---|
| **1 Acquire and monitor**<br>Guided acquisition and full-process preview monitor both background and sample spectra while instrument and cavity status remain visible. | **2 Process and interpret**<br>Peak labeling, spectrum/constant arithmetic, spectrum/spectrum arithmetic, ATR correction, smoothing and derivative tools support interpretation. |
| **3 Search and compare**<br>Search by substance name, measured spectrum or file; compare files and identify samples against supplied or user-maintained libraries. | **4 Calibrate and report**<br>One-click intelligent laser-frequency correction supports standardized workflows, while result reporting and archiving keep routine work organized. |

## Spectral libraries, calibration and user knowledge

| Capability | Source-supported content |
|---|---|
| **Standard reference spectra** | More than 1,700 common substances in the built-in library |
| **Optional libraries** | National pharmacopoeia and pharmaceutical packaging-material libraries |
| **User-defined libraries** | Add, organize and maintain customer spectra as the knowledge base grows |
| **Laser correction** | One-click correction supports workflows aligned with GB/T 21186-2007 and JJF 1319-2011 |

SAMPLING AND APPLICATIONS

# Flexible Configuration

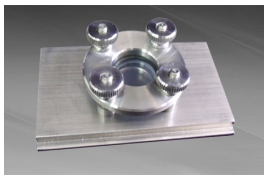
## Three practical routes from sample to spectrum

Configure SF700Z for classic transmission, rapid ATR, reflection or infrared-microscopy workflows across solids, powders, liquids, films and surfaces.

### KBr pellet transmission

POWDERS AND SOLIDS

Grind approximately 1 mg of dry sample with approximately 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 moistur.


### ATR measurement

SOLIDS, POWDERS, LIQUIDS AND SURFACES

Place the sample in firm contact with a ZnSe or diamond ATR crystal and acquire the spectrum directly. ATR simplifies difficult-to-grind, insoluble and non-destructive surface measurements.

## Representative application areas

| | |
|---|---|
| **Biopharma**<br>Identity and comparison of active materials and packaging | **Materials science**<br>Structure and composition studies across engineered materials |
| **Petrochemicals**<br>Qualitative screening of fuels, oils, additives and intermediates | **Food safety**<br>Ingredient, additive and authenticity-oriented analysis |
| **Environmental**<br>Screening of collected materials and contamination samples | **Polymers & rubber**<br>Direct ATR analysis of difficult-to-grind or insoluble samples |
| **Coatings & surfaces**<br>ATR, planar, diffuse and external-reflection workflows | **Teaching & research**<br>Molecular identification, interpretation and method development |

## Common accessory selection

| Route | Typical accessory set |
|---|---|
| **Pellet preparation** | Press, pellet die, agate mortar, spectroscopic-grade KBr and drying oven |
| **Liquid transmission** | Demountable liquid cell, infrared windows and thickness spacers |
| **Advanced modes** | ZnSe or diamond ATR, diffuse/planar/external reflection and infrared microscope |

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 |
|---|---|---|---|---|
| ≤ ±5 $cm^{-1}$ | 3027 $cm^{-1}$ | 3026.49 $cm^{-1}$ | −0.51 $cm^{-1}$ | **Pass** |
| ≤ ±5 $cm^{-1}$ | 2851 $cm^{-1}$ | 2850.44 $cm^{-1}$ | −0.56 $cm^{-1}$ | **Pass** |
| ≤ ±1 $cm^{-1}$ | 1601 $cm^{-1}$ | 1601.17 $cm^{-1}$ | +0.17 $cm^{-1}$ | **Pass** |
| ≤ ±1 $cm^{-1}$ | 1028 $cm^{-1}$ | 1028.63 $cm^{-1}$ | +0.63 $cm^{-1}$ | **Pass** |
| ≤ ±1 $cm^{-1}$ | 907 $cm^{-1}$ | 906.93 $cm^{-1}$ | −0.07 $cm^{-1}$ | **Pass** |

### RESOLUTION CHECK

The supplied verification document reports that seven peaks in the 3110–2850 $cm^{-1}$ region were clearly resolved. SF700Z is specified at better than 0.85 $cm^{-1}$ spectral resolution, with a 0.5 $cm^{-1}$ option.

## 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.
- Protect the source, detector, beam splitter and windows from prolonged moisture exposure.
- Contact technical support if abnormal performance is observed.

*Specifications and configurations are subject to change without notice. Images are illustrative. Rev. A | 2026-08*

CONTACT / SUPPORT

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