



## Agilent 660/670/680 Series FTIR

The world's best FTIR

### Specifications



#### Design overview

The Agilent 660 FTIR spectrometer design is based on a 38 mm dynamically aligned, 60° mechanical bearing Michelson interferometer and is capable of covering the widest spectral range down to 20  $\text{cm}^{-1}$ . The Agilent 660 FTIR guarantees better than 0.075  $\text{cm}^{-1}$  maximum resolution, and includes a revolutionary air-cooled source capable of delivering more than 50 mW of power to the sample. The Agilent 660 FTIR can also be upgraded to a 670 or 680 FTIR, providing you with maximum flexibility as your FTIR needs change.

The Agilent 670 and 680 FTIR incorporate a 57 mm dynamically aligned, 60° air bearing Michelson interferometer covering the widest spectral range down to 10  $\text{cm}^{-1}$ . Both spectrometer models come with the high-throughput air-cooled source, delivering over four times greater sensitivity than any other available FTIR spectrometer. The Agilent 670 FTIR is a rapid scan spectrometer that can be upgraded to the step-scan Agilent 680 FTIR system.

The 660/670/680 Series FTIR are compatible with a wide range of accessories. These include single point microscopy, microscopy imaging, macro imaging, ATR imaging, PAS, PM-IRRAS,  $\mu\text{s}$  and nsTRS and hyphenated techniques such as GC-IR, GPC-IR and TGA-IR.

Agilent FTIR spectrometers are manufactured according to a quality management system certified to ISO 9001.



## Performance specifications

Type	660 FTIR	670 FTIR	680 FTIR
<b>Interferometer type</b>	38 mm dynamically aligned, 60° mechanical bearing Michelson	57 mm dynamically aligned, 60° air bearing Michelson	57 mm dynamically aligned, 60° air bearing Michelson
<b>Spectral range (cm<sup>-1</sup>)<sup>1</sup></b>			
Standard	Mid IR: 9,000–375	Mid IR: 9,000–375	Mid IR: 9,000–375
Optional	53,000–20	53,000–10	53,000–10
<b>Spectral resolution (cm<sup>-1</sup>)</b>			
Typical	Better than 0.06	Better than 0.06	Better than 0.06
Guaranteed	Better than 0.075	Better than 0.075	Better than 0.075
<b>Signal-to-noise ratio<sup>2</sup></b>			
Guaranteed 5 sec p-p	>10,000:1 p-p	>12,000:1 p-p with 75% beam attenuation	>12,000:1 p-p with 75% beam attenuation <sup>3</sup>
Typical 5 sec p-p	>16,000:1 p-p	>17,500:1 p-p with 75% beam attenuation	>17,500:1 p-p with 75% beam attenuation
Typical 5 sec p-p with ATR	>4,500:1 p-p	>12,000:1 p-p	>12,000:1 p-p
Typical 1 min p-p	>50,000:1 p-p	>50,000:1 p-p with 75% beam attenuation	>50,000:1 p-p with 75% beam attenuation
Typical 1 min RMS	>210,000:1	>215,000:1 with 75% beam attenuation	>215,000:1 with 75% beam attenuation
<b>Infrared power</b> (at the sample focus)	>50 mW	>160 mW	>160 mW
<b>Wavenumber</b>			
Wavenumber accuracy	0.005 cm <sup>-1</sup> at 2200 cm <sup>-1</sup>	0.005 cm <sup>-1</sup> at 2200 cm <sup>-1</sup>	0.005 cm <sup>-1</sup> at 2200 cm <sup>-1</sup>
Wavenumber precision	0.003 cm <sup>-1</sup>	0.002 cm <sup>-1</sup>	0.002 cm <sup>-1</sup>
<b>Photometric performance</b>			
Ordinate linearity DLaTGS (Deviation from 0%T based on ASTM1421)	Better than 0.06%T	Better than 0.06%T	Better than 0.06%T
Ordinate linearity, linearized MCT (Deviation from 1.60 Abs polystyrene peak at 2920 cm <sup>-1</sup> )	Better than 0.10 Abs	Better than 0.10 Abs	Better than 0.10 Abs
<b>Kinetics scan rates</b>			
Standard (16 cm <sup>-1</sup> spectral resolution)	>40 spectra/second	>110 spectra/second (Better than 10 ms/spectra)	>110 spectra/second (Better than 10 ms/spectra)
Optional (16 cm <sup>-1</sup> spectral resolution)	>70 spectra/second		
<b>Time resolved spectroscopy</b>			
µs sampling rate	Upgrade	Upgrade	1.67 µs
ns sampling rate	Upgrade	Upgrade	1 ns

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## Performance specifications

Type	660 FTIR	670 FTIR	680 FTIR
<b>Spectrometer enclosure</b>			
Standard	Sealed and dessicated	Purged	Purged
Optional	Purged or tropical (moisture-resistant windows)	N/A	N/A
<b>A/D converter</b>	Delta-Sigma, 24 bit, 600 kHz (Dual ADC optional)	Delta-Sigma, 24 bit, 600 kHz (Dual ADC standard)	Delta-Sigma, 24 bit, 600 kHz (Dual ADC standard)
<b>Spectrometer interface</b>	USB 2	USB 2	USB 2
<b>External ports</b>	3 (left, right and rear emission)	3 (left, right and rear emission)	3 (left, right and rear emission)
<b>Upgradeable</b>	Yes, to 670 or 680 FTIR	Yes, to 680 FTIR	N/A
<b>Step-scan specifications</b>			
Step-scan capability	Upgrade	Upgrade	Yes (DSP1, 2 and 3) <ul style="list-style-type: none"> <li>• PM-IRRAS<sup>4</sup></li> <li>• Polymer stretching</li> <li>• <math>\mu</math>s Time Resolved Spectroscopy (TRS)</li> <li>• ns Time Resolved Spectroscopy (TRS)</li> <li>• Simultaneous multidepth profiling using PAS<sup>4</sup></li> </ul>

## Physical specifications

Type	660 FTIR	670 FTIR	680 FTIR
<b>Sample compartment dimensions (W x D x H)</b>	23.2 x 27.6 x 15.4 cm (9.1 x 10.9 x 6.1 in.)	23.2 x 27.6 x 15.4 cm (9.1 x 10.9 x 6.1 in.)	23.2 x 27.6 x 15.4 cm (9.1 x 10.9 x 6.1 in.)
<b>Spectrometer dimensions (W x D x H)</b>	70.8 x 75.6 x 34.4 cm (27.9 x 29.8 x 13.5 in)	70.8 x 75.6 x 34.4 cm (27.9 x 29.8 x 13.5 in)	70.8 x 75.6 x 34.4 cm (27.9 x 29.8 x 13.5 in)
<b>Weight</b>	80 kg (176 pounds)	80 kg (176 pounds)	80 kg (176 pounds)

## Configurations

Standard system configurations <sup>5</sup>	Range (cm <sup>-1</sup> ) <sup>6</sup>	Source(s)	Beamsplitter(s)	Detector(s)
Mid-IR	9,000–375	Ceramic	Extended range KBr	Cooled DLaTGS
Near-IR	15,800–2,800	Tungsten-halogen	NIR quartz	PbSe
Mid-Near IR (dual)	15,800–375	Ceramic, tungsten-halogen	Extended range KBr/ NIR quartz	Cooled DLaTGS/PbSe
Mid-Far IR	6,000–225	Ceramic	CsI	Cooled DLaTGS
Far-IR	700–10	Ceramic or Hg-arc	Mylar	Far-IR DLaTGS or Bolometer <sup>7</sup>
Vis	25,000–8,600	Xenon/Tungsten halogen	UV quartz	Silicon
UV-Vis	53,000–12,000	Deuterium	UV quartz	PMT
Configurable options	Type	Spectral range (cm <sup>-1</sup> )		
<b>Sources</b> (Single or dual source assemblies available)	Ceramic air-cooled	Mid-IR: 9,000–20		
	Tungsten halogen source	Vis-Near-IR: 25,000–2,100		
	Hg-Arc (external)	Far-IR: 600–10		
	Xenon (external)	UV-Visible: 40,000–10,000		
	Deuterium (external)	UV: 53,000–12,000		
<b>Beamsplitters</b> (With internal storage for 2 extra beamsplitters)	Extended range KBr	11,000–375		
	CsI	6,000–225		
	NIR quartz	20,000–2,800		
	UV-Vis quartz	53,000–4,000		
	CaF <sub>2</sub>	18,000–1,200		
	Set of 5 Mylar ( 6.25, 12.5, 25, 50 and 125 µm)	700–10		
<b>Detectors</b> (Single or dual detector assemblies available)	Cooled/ambient DLaTGS	18,000–150		
	MCT detectors	12,000–450		
	Linearized MCT detectors	12,000–450		
	Far-IR DLaTGS	700–20		
	Lead selenide (PbSe)	15,800–2,000		
	Silicon	25,000–8,600		
	Far-IR bolometer <sup>7</sup>	600–10		
	PMT: R446	54,000–11,500 (185–870 nm)		

# Agilent 660/670/680 Series FTIR

## Accessories

Type	Specification
The Agilent 660/670/680 Series FTIR are compatible with sample compartment accessories from all major accessory manufacturers and uses Accessory Recognition Technology (ART).	
<b>Major accessories include</b>	610 Microscope
	620 Microscope
	Focal Plane Array (FPA) chemical imaging
	Large Sample (LS) accessory for macro imaging
	External sample compartment
	GC-IR accessory
	GPC-IR

## Support policies

Type	Policy
<b>Warranty</b>	12 months, though this may vary according to location.
<b>Hardware support period</b>	Seven (7) years from date of last unit manufacture. After this time, parts and supplies will be provided if available.
<b>Software support</b>	Software upgrades to add additional functionality will attract a fee.

## Further details

More information
For further information please consult your Agilent office or supplier, or our Web site at <a href="http://www.agilent.com">www.agilent.com</a> .

1. The represents only an approximate range based on a configuration with Mid IR source, KBr beamsplitter and DLaTGS detector.
2. Measured as peak-to-peak, between 2,200 and 2,100  $\text{cm}^{-1}$  under a standard configuration with 4  $\text{cm}^{-1}$  spectral resolution. The ATR measurement is made using a single bounce, diamond ATR accessory and the peak-to-peak signal-to-noise ratio is calculated between 2,800 and 2,700  $\text{cm}^{-1}$ .
3. 75% beam attenuation is required, as under 'open beam' conditions the detector is saturated due to too much energy.
4. Rapid scan options available for the 660 and 670 FTIR.
5. Other configurations may be available.
6. This represents only an approximate range based on the configuration of components shown in the table. Other combinations components may alter this range.
7. Bolometer is only available on the 670/680 FTIR.

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