

### Liquid Material Verification



#### Introduction:

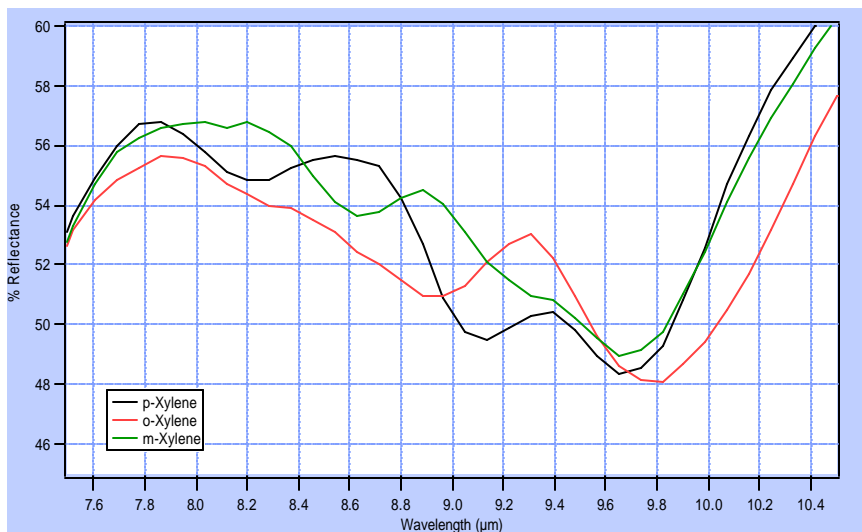
Large manufacturing facilities often get truck or railcar loads of different liquid materials. With an InfraSpec VFA-IR Spectrometer, samples can be analyzed at remote locations without having to bring samples to a centralized laboratory and delaying the off-loading of raw material. Problems can be caught before they become expensive errors. Because many materials have characteristic absorbances in the mid infrared range, stored spectra of expected materials can be used for verification of incoming liquid materials. The InfraSpec VFA-IR Spectrometer is a light weight, rugged and portable solution to on-site applications at a much lower cost than an FTIR. The InfraSpec brings the measurement out of the laboratory to where it is needed, in the production area, on a loading dock or in a warehouse.

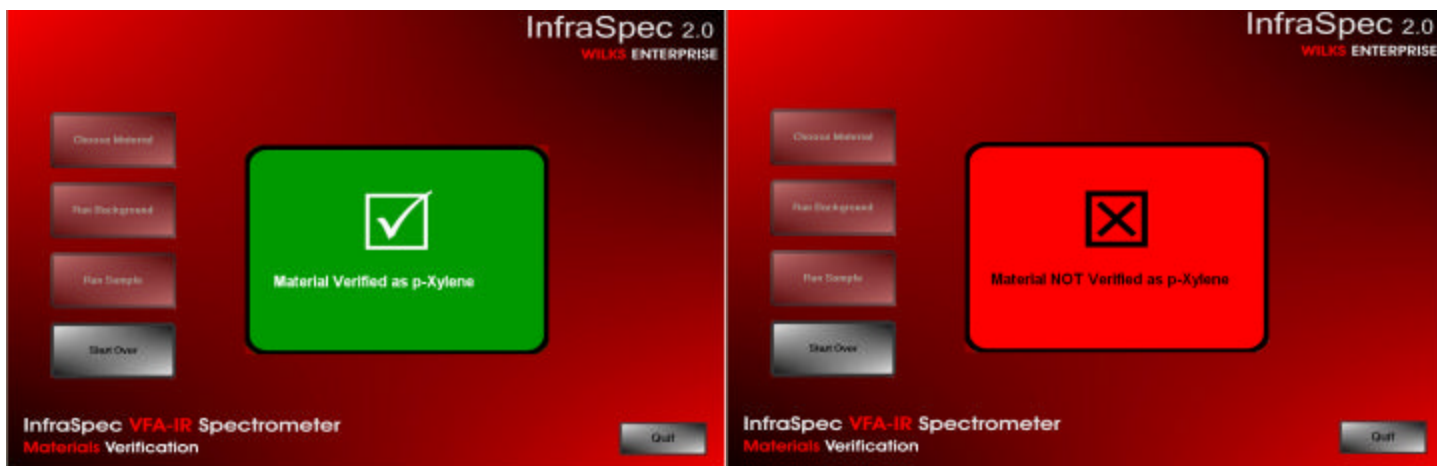
#### Operating Principal:

The InfraSpec VFA-IR Spectrometer is a new concept in infrared instrumentation. It utilizes a patented design consisting of an Attenuated Total Reflection (ATR) sample plate with an electronically modulated source on one end and a linear variable filter (LVF) and combined with a 128 pixel detector array on the other. The result is an infrared analyzer that, unlike an FTIR spectrometer, has no moving parts and an insignificant optical air path. This makes for a portable, rugged analyzer suitable for use in a field environment. A LVF typically covers an octave in wavelength (ie: 2.5-5.0  $\mu\text{m}$  ( $2000\text{-}400\text{ cm}^{-1}$ ) or 5.4-10.8  $\mu\text{m}$  ( $1850\text{-}925\text{ cm}^{-1}$ )). Either an ATR (attenuated total reflection) or transmission sample system can be used depending on the application.

#### Analysis:

For analysis, the liquid sample is simply placed on the ATR crystal or into a sealed cell or cuvette. These spectra of p-Xylene, o-Xylene and m-Xylene are from the InfraSpec VFA-IR Spectrometer with an ATR platform. Because each has a characteristic spectrum, the different Xylenes can be verified by matching them against stored spectra.





With a simple interface for non technical operators, a material is placed on the sample plate and with predetermined parameters the material either is accepted or rejected as shown in these screen displays. The spectrum is stored for technicians to review if necessary. A library of materials can be stored and called up for verification as shown in the sample above.

### *InfraSpec VFA-IR Spectrometer- ATR Sample Stage Specifications:*

<b>Dimensions</b>	6.5" x 4.25" x 1.6", 16.5 x 11 x 4 cm <sup>3</sup>
<b>Weight</b>	3.5 lbs., 1.5 kg
<b>P.C. Interface</b>	RS 232, USB
<b>Power Requirements</b>	12V DC, 2.0 amps
<b>Power Supply</b>	Universal AC/DC converter type (supplied as standard)
<b>Suggested Temperature Operating Range</b>	15°C - 60°C
<b>Humidity</b>	0 – 98% relative humidity (non-condensing)
<b>Detector Array</b>	128 Pixel linear pyroelectric array
<b>Array Responsivity</b>	5.4-10 <sup>5</sup> V/W
<b>ATR Surface Size</b>	50 x 16 mm
<b># of Reflections</b>	10
<b>Standard Spectral Ranges</b>	2.5-5 μm (2000-400cm <sup>-1</sup> ) 5.4-10.8 μm (1850 – 925 cm <sup>-1</sup> )
<b>ATR Crystal Material</b>	Cubic Zirconia, Zinc Sulfide, Zinc Selenide
<b>Resolution</b>	25 μm

### *InfraSpec VFA-IR Spectrometer Transmission/Sealed Cell Sample Stage Specifications:*

<b>Dimensions</b>	5" x 5" x 2.5", 12.7 x 12.7 x 6.4 cm
<b>Weight</b>	3.5 lbs., 1.5 kg
<b>P.C. Interface</b>	RS 232, USB
<b>Power Requirements</b>	12V DC, 2.0 amps
<b>Power Supply</b>	Universal AC/DC converter type (supplied as standard)
<b>Suggested Temperature Operating Range</b>	15°C - 60°C
<b>Humidity</b>	0 – 98% relative humidity (non-condensing)
<b>Detector Array</b>	128 Pixel linear pyroelectric array
<b>Array Responsivity</b>	5.4-10 <sup>5</sup> V/W
<b>Sealed Cell or cuvette (supplied by customer)</b>	Pathlength determined by application
<b>Standard Spectral Ranges</b>	2.5-5 μm (4000-2000cm <sup>-1</sup> ) 5.4-10.8 μm (1850 – 925 cm <sup>-1</sup> )
<b>Resolution</b>	25 μm

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