

## SisuCHEMA frequently asked questions

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### What is SisuCHEMA?

SisuCHEMA is a completely integrated Chemical Imaging Workstation. A solution engineered with simplicity as a design forethought and optical performance as an outright requirement.

SisuCHEMA is a simple to use, high-performance Chemical Imaging Solution, which for the first time, is allowing users to focus on their research, without the vertical learning curve associated with other instruments.

SisuCHEMA is a straightforward to configure, and simple to use, with all necessary components included with the system.

### What is the typical wavelength range of SisuCHEMA?

SisuCHEMA comes in two different versions.

- The SWIR model operates in the 970-2500 nm range.
- The NIR model operates in the 900-1700 nm range.
- Both models utilize SPECIM's powerful push-broom hyperspectral imaging technology.

### Is SisuCHEMA a single point spectrometer?

No it isn't! SisuCHEMA is a powerful push-broom imaging technology is not limited to imaging samples, but also makes an ideal solution in applications requiring continuous on-line process monitoring. Consequently, technologies developed for sample analysis in laboratory can be directly applied to online and quality control processes, using the same modular technology.

### Can you give some examples of the types of results I can expect from SisuCHEMA?

Near Infrared (NIR) spectroscopy is widely used for chemical material analyses.

SisuCHEMA, as a highly effective Chemical Analysis tool, and being a combination of NIR spectroscopy and high-resolution imaging, provides you with invaluable information on your samples e.g.

- Chemical Composition
- Unique Component Quantities within your sample
- Component Distribution throughout your sample.

## What application areas has SisuCHEMA been designed for?

Having all these possibilities available, SisuCHEMA becomes a relevant to throughout a variety of applications. These applications are by no means exhaustive, but can give you a general example of areas where SisuCHEMA technology has been employed.

- Process Analytics
- Life sciences
- Pharmaceutical Process Control and Quality Assurance,
- Food or Dairy Process Control and
- Food and Agricultural Material Screening,
- Quality Assurance
- Forensics, Cosmetics, Human Health, Toxicology, Tissue analysis
- Purity
- Color Measurement

## What kind of samples can I measure with SisuCHEMA?

SisuCHEMA workstation measures the reflectance spectra of the samples, so the recommended samples are in near-solid state rather than a pure liquid. The maximum sample size is defined by spatial resolution required. The length of the samples in scanning direction can always be up to 100mm maximum. The limitation for the width of the samples is the following depending on the spatial resolution required (this depends on the lens used and the measurement distance).

## What is the maximum thickness of the samples I can measure with SisuCHEMA?

SisuCHEMA currently allows a maximum of 10mm sample height. We anticipate this height being slightly improve in the future, however properly illuminating samples and avoiding shadows, is directly related to the sample height, and ultimately the quality of the measurement.

## How fast can 100mm sample be measured?

Upon initiation of a data capture, SisuCHEMA automatically takes dark and white reference, and then moves the selected sample range before returning to the start position at the white reference tile. The total process takes less than takes 8seconds at the highest resolution setting and about 12seconds at the highest height (widest field of view). Nevertheless, SisuCHEMA has the fastest data capture rate of any chemical imaging solution on the market today.

## Will the SisuCHEMA illumination heat up my samples during the measurement?

The illumination solution is designed to minimize the heat load to the samples by illuminating only a single line in the sample area required by the push-broom approach. A very small amount of heat effect cannot be avoided, as the samples are radiated in the infra-red range.

## What lens options are available for SisuCHEMA?

The SisuCHEMA is equipped with two different lenses meant to be used with different samples sizes. These lenses are included with the system without additional cost.

1. 31mm lens for providing spatial resolution 150um-300um.
2. 73mm lens for 30um spatial resolution imaging with magnification 1.

## If I find some interesting region within my samples that I would like to take a closer look at, Can I adjust SisuCHEMA for a close up look?

Of course you can. The approach in average measurement is to collect data from larger samples using first lens in the SisuCHEMA. If then one is interested in certain detail in the samples one switch the system to the high resolution mode by changing the lens. The result from this image acquisition is data from desired area using 30um spatial resolution. When using magnification 1 lens one needs to remember that length of the image line in the sample space is limited by detector size. In SisuCHEMA the high resolution imaging limits the maximum sample size to 10mm.

## What is the maximum sample size I can measure with SisuCHEMA?

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Spatial resolution (um)	Used lens	Max sample width	Max sample length	Max sample height / thickness	Recommended sample height / thickness
30	1to1 lens	10mm	100mm	10mm	5mm
150	31mm	50mm	100mm	10mm	5mm
300	31mm	100mm	100mm	10mm	5mm

It is recommended that before the measurement the samples are prepared to be as planar as possible.

## Do I to supply my own computer to use SisuCHEMA?

Not required. The SisuCHEMA Chemical Imaging workstation is equipped with its own integrated PC. The PC is preconfigured with data acquisition and Image processing tools required to start working immediately. So the user has only to add their own locality specific keyboard, mouse and monitor (1 or 2), then supply either 220V/50Hz or 110V/60Hz to start working,

## When the product is delivered, what else do I need to purchase before I can start measuring?

SisuCHEMA workstation is fully functional system including all necessary components. The system includes, either NIR or SWIR range Spectral Camera, illumination unit, motion module for sample movement and image formation, ChemaDAQ for data acquisition and Evince for Image analysis. All power and cabling accessories required are included.

What we don't include is the **computer monitor**, **USB keyboard**, or **mouse**. We believe that customers have their own ergonomic preferences and would be happier sourcing these items separately and locally from one of their own neighborhood computer hardware outlets.

## If the sample trays you deliver with SisuCHEMA are not adequate for my measurements, how can I get additional sample trays which fit my application needs?

Within your SisuCHEMA packaging, you will find documentation and mechanical drawings required to produce your own application specific sample trays. Any good metals or plastic machine shop can machine or mold you sample trays according to your requirements.

## How can I get more information about SisuCHEMA?

Please visit <http://sisu.specim.fi> for the latest product information, or to contact us through the website. Your questions will be added to this FAQ, and periodically, we will update the FAQ and distribute it to interested parties as well as posting it to the SisuCHEMA website.

## What does Sisu mean?

Sisu is a Finnish term that could be roughly translated into English as strength of will, determination, perseverance, and acting rationally in the face of adversity. The equivalent in English is "to have guts", and indeed, the word derives from sisus, which means something inner or interior. However, Sisu has a long-term element in it; it is not momentary courage, but the ability to sustain the same.

For more information on this term please visit [en.wikipedia.org/wiki/Sisu](http://en.wikipedia.org/wiki/Sisu)