

Composition of the SERS substrates



Small form factor and very cost efficient SERS substrates. The active SERS area is formed using an ultra-short pulse laser on a soda-lime glass substrate. The substrate material is a weak Raman scattered and therefore particularly suitable for SERS (as compared to most crystalline materials). The resulting surface structure features stochastic nanopattern, which meets good resonance characteristics for various excitation wavelengths and adsorbed analyte molecules. A single SERS substrate can be used for various experimental conditions, analytes and results in a very high relative enhancement ratio of the Raman scattering up to 10^6 . Silver-plated SERS works well not only in the IR range of excitation

wavelengths like golden ones, but also in a visible (blue, green) range as well.

Convenient size of the overall substrate (12.5 x 5 x 1 mm) fits nicely into universal multi-wavelength Raman microscopes and can be used with dedicated compact SERS readers or spectrometers as well. Active area of the standard 'RandaS' and 'MatoS' SERS substrates is 3 x 5 millimetres by default. Flexible manufacturing technique allows to change (increase or decrease) the size of the SERS area on request. Active areas as large as 10 x 10 mm have been produced specifically for application of electrodes (electro-chemical experiments).

All 'RandaS' and 'MatoS' Raman substrates are vacuum packed in a cleanroom environment. No glue or other chemical substances are used during manufacturing, i.e. for attachment of active area chips to submounts (which is a common feature of counterpart products)

We specify 2 months shelf life, nonetheless, we have used substrates, which were produced 6 months prior to use and have not noticed any significant degradation.

Product specifications

Size (mm)	12.5 x 5 x 1
Active area (mm)	3 x 5
Sampling method	Drop deposition, immersion
Recommended excitation wavelength	RandaS - from 445 nm to NIR MatoS - from 600 nm to NIR

'RandaS' substrate performance comparison with different laser wavelengths

Below we provide the results of tests performed with the 'RandaS' SERS substrate, using standard Raman benchmarking material – **thiophenol**.

Tests were carried out using Renishaw In-VIA universal Raman microscope featuring different wavelength laser lines including 785 nm, 633 nm, 532nm;

