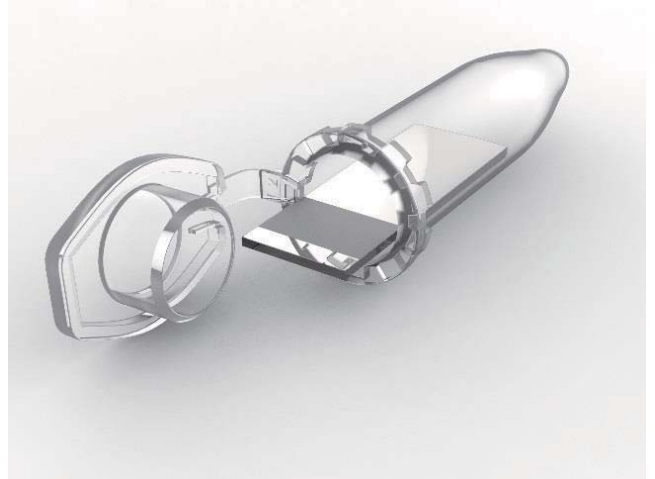


# ATO ID™

## New type SERS substrates 'RandaS' and 'MatoS'

Our goal is to improve ATO ID products and to make them meet clients' expectations – It is the reason why we have produced new type SERS substrates 'RandaS' and 'MatoS'. Comparing to previous 'Randa' and 'Mato' substrates, new SERS are much smaller and cheaper, furthermore all substrates are placed into microcentrifuge tubes for on-the-spot detection and analyses of immersed material. Despite the modification, these substrates are still 8 times more sensitive than the current gold standard on the market – please find the comparison below.



### 'RandaS' SERS Substrate

Small form factor and very cost efficient SERS substrates. RandaS are vacuum packed separately in 1.5 ml microcentrifuge tubes.

- Overall size: 12.5x5x1 mm
- Active area: 3x5 mm
- Coating: silver
- Excitation wavelengths: 442 nm to NIR



RandaS

### 'MatoS' SERS Substrate

Small form factor and very cost efficient SERS substrates. RandaS are vacuum packed separately in 1.5 ml microcentrifuge tubes.

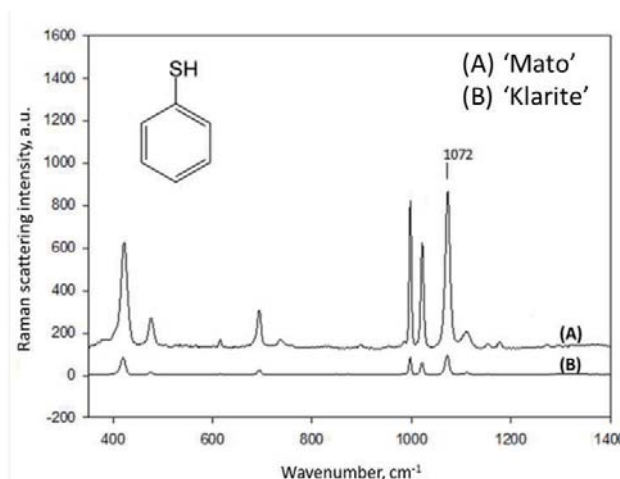
- Overall size: 12.5x5x1 mm
- Active area: 3x5 mm
- Coating: gold
- Excitation wavelengths: 600 nm to NIR



MatoS

## 'Mato' substrate enhancement comparison with 'Klarite' substrates

Below we provide experimental data, which is used to evaluate and compare enhancement factors of 'Mato' and market standard 'Klarite' (Renishaw, UK) substrates. In this test we used thiophenol, which is a standard benchmarking material. For the most accurate comparison nanostructured soda-lime 'Mato' surface was coated with a 200 nm thick gold film. Tests were carried out using Renishaw In-VIA universal Raman microscope featuring 785 nm laser line. Laser power was set to 1 mW and 5x magnification lens was selected. The spectrum was registered for 100 s and normalized to 1 s thereafter. Deformational vibrations of -CS- and benzene ring at 1072 cm<sup>-1</sup> was chosen for determining the ratio of Raman signal enhancement efficiency between the two substrates. This comparison is illustrated in the figure on the right, whereas graphs (A) and (B) are Raman spectra from respectively 'Mato' and 'Klarite' substrates. Calculated peak area at 1072 cm<sup>-1</sup> revealed an 8.4 times difference to the favour of 'Randa'.



In conclusion, the stochastic nanostructures on soda-lime glass used in 'Mato' SERS substrates, are approximately **8 times** more efficient in comparison to photolithographically etched structures of commercial 'Klarite' substrates



反応エリアの拡大画像