

# rap.ID Layer Explorer® Application Note #2 Silicone Layer Distribution in Cartridges

## Silicone Layer in Cartridges

Cartridges are typically used in novel pen devices for application. The optimum amount and distribution of baked-on silicone oil ensures the flawless operation of the device.

## Sample

Insuline cartridge 1 ml. Baked-on silicone with standard parameters: 3% PDMS 350 cSt., 25 min @ 280 °C.

## Layer Explorer UT 2.0 Measurement

The Layer Explorer UT 2.0 automatically measures the thickness from 20 nm and over and the distribution of the silicone lubrication layer.

6 strips of 45 data points were measured around the PFS barrel and the thickness distribution was used to output the mass of silicone oil. The entire measurement took 25 minutes.

## Results from the thickness measurement

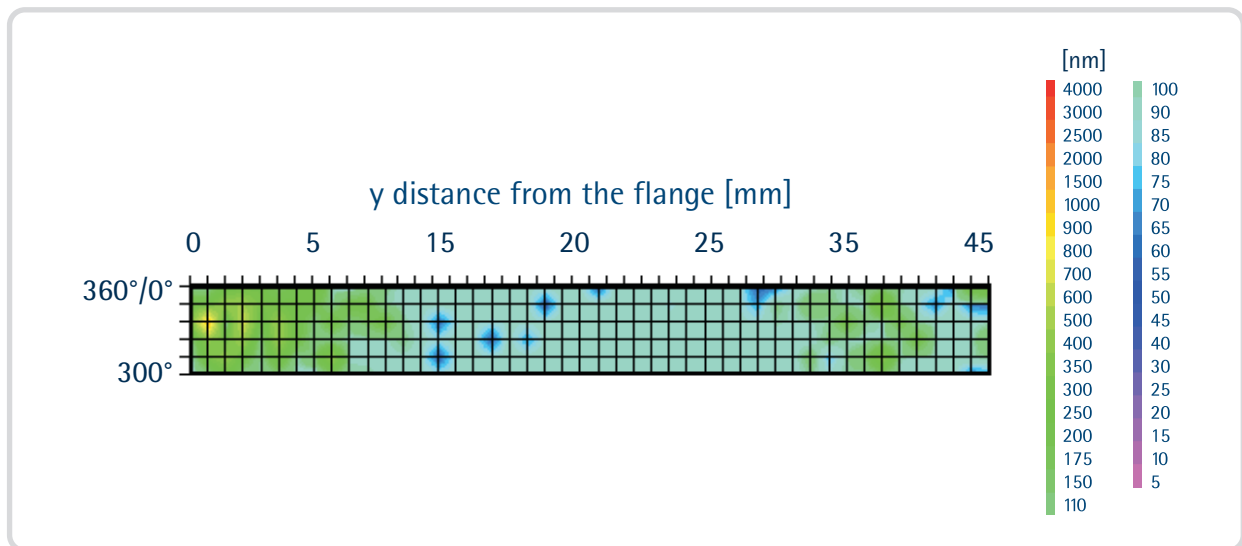


Fig.1 shows the radial silicone oil distribution on the barrel of a cartridge.

For a baked on cartridge unusually high silicone oil thickness in the range from 300 up to 500 nm was detected in the first 18 mm of the cartridge. From 21 mm up to 40 mm the cartridge shows a regular and normal silicone distribution. However, holes (< 20 nm) were also detected in the silicone layer. The average layer thickness in this syringe was calculated to be 114 nm.

## Benefits

The Layer Explorer is able to measure the local distribution of the baked-on silicone distribution in a cartridge. Optimization of the siliconization parameters such as: emulsion and application and curing are now possible.