

Layer Explorer® Application Note Silicone Layer Distribution in Prefilled Syringes



Silicone Layer in Prefilled Syringes

An optimum amount of well-distributed silicone oil ensures the smooth operation of a syringe or carpule for the user.

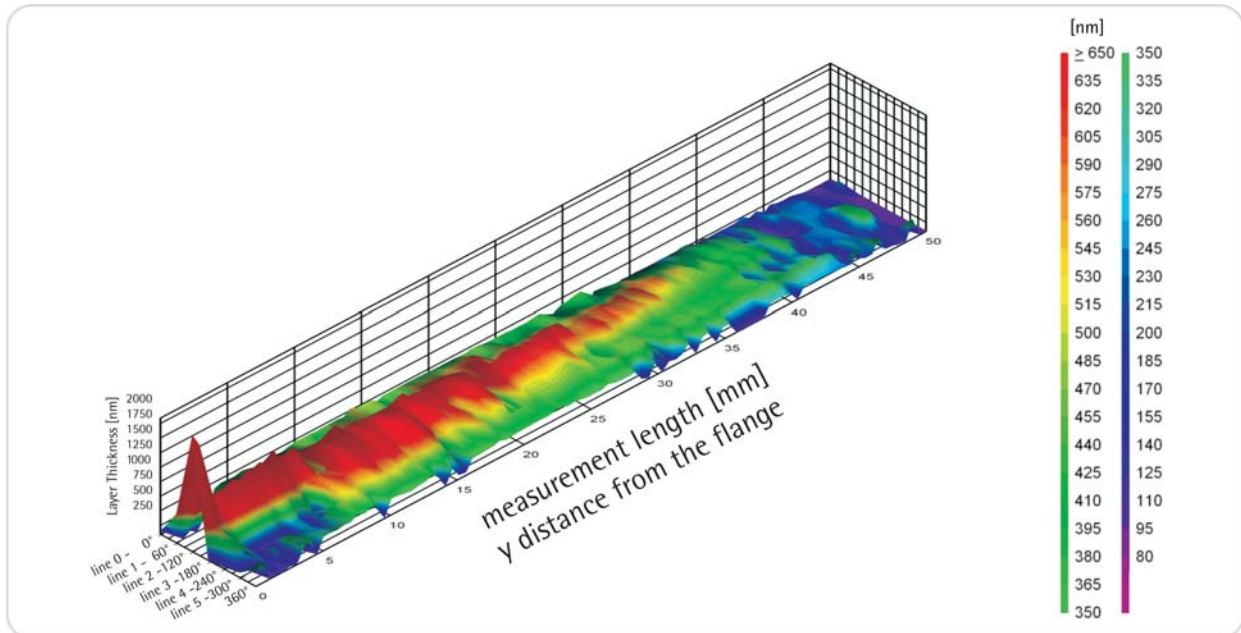


Fig.1 silicone oil distribution in a pre-filled syringe - horizontal storage for 4 weeks at room temperature.

Sample

The 1 ml long syringe was stored horizontally for 12 days.

Measurement with the Layer Explorer

The Layer Explorer automatically measures the thickness of the silicone layer inside a syringe.

6 strips of 50 data points were measured around the PFS barrel and the thickness distribution was used to output the mass of silicone oil. The measurement took 5 minutes, and $50 \times 6 = 300$ measurement points were obtained.

Results from the thickness measurement

Figure 1 shows the radial silicone oil distribution on the barrel of the syringe. On the lower part of the barrel, more than 10 times the amount of silicone is visible.

Average layer thickness: 414 nm

Total amount of silicone: 397µg

Benefits

The Layer Explorer measures the local distribution of silicone oil in a syringe. Optimisation of silicone oil distribution enables the user to minimize the total amount of silicone while also ensuring a homogeneous silicone layer.

This data is useful for the optimisation of a silicone spray system and can improve the entire spray profile within minutes. Prefillable syringe quality and usability can be evaluated. Total silicone content can be controlled reliably.