

How can skived vs cast headspace septa affect quantitation – FAQ

In headspace analysis, it is of utmost importance that a tight seal is formed between the septum of the cap and the vial. If there are even small gaps present in the seal, some of the **analyte** will escape through these gaps and lead to low **recovery**. In order to avoid problems of this kind, the quality of the septa should always be considered.

There are two manufacturing methods for PTFE used in headspace caps. The first method is **skiving**. In this technique, a long tube-shaped portion of PTFE material is mechanically cut at regular intervals to produce the circular septa discs used in the final headspace cap product. The second method is known as **casting**. Here the PTFE material is poured into molds in the shape of the headspace septa. Skiving is the cheaper of the two techniques because quality molds are expensive to manufacture. However, the skiving process is known to produce widespread defects in the material surface. On the edges of the material where the PTFE contacts the vial when sealed, these defects cause gaps in which volatile compounds may escape.

The difference in quality between these two septa types is readily apparent under magnification. Figure A below shows the PTFE side of a cast septum used in MicroSolv Headspace Crimp Caps (catalog # 95025-07-1S). The surface here has only a few minor imperfections. In Figure B, the PTFE surface of a market leading skived headspace cap is shown. Here the surface has significant grooves all throughout the material. These grooves are the result of skiving techniques.

Figure A:



Figure B:



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MicroSolv Technology Corporation

9158 Industrial Blvd. NE, Leland, NC 28451

tel. (732) 380-8900, fax (910) 769-9435

Email: customers@mtc-usa.com

Website: www.mtc-usa.com

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