

### Overview

The Savillex PFA Cyclonic Spray Chamber (CSC) is available with a surface treatment to improve wettability, giving it equivalent sensitivity to a glass or quartz cyclonic. It is thought that surface treatment enhances sensitivity because the improved wettability reduces droplet formation on the side walls. Without surface treatment, these droplets absorb sample aerosol and reduce aerosol transmission. An untreated version of the CSC is also available, and it is recommended for ultratrace applications such as semiconductor analysis using ICP-MS. For applications that require maximum sensitivity (including all ICP-OES applications), the treated version is recommended.

The Savillex CSC surface treatment is a proprietary, organic based surface treatment which has a finite lifetime. The surface treatment can not be reapplied. The cyclonic should be replaced when the surface treatment is no longer effective.



PFA Cyclonic Spray Chamber

### Surface Treatment Lifetime

What lifetime can be expected from a treated CSC? That is dependent on the sample matrix and sample throughput, but typically one to three years. High matrix samples such as sodium fusions containing HF will degrade the treatment faster than simple dilute acid matrices. Likewise an ICP-OES that is used all day, every day, over two shifts will degrade the CSC treatment faster than a low throughput instrument. When the treatment reaches the end of its life the inner walls of the CSC become less “wetable” and large droplets can be readily seen (easy observation of droplets is a benefit of the relative transparency of the Savillex molded design). The user will also note a fall-off in sensitivity of up to 40%. Due to the surface treatment, the wettability does not decrease from day one, and users report good performance until close to the end of the surface treatment lifetime.

The following images show how to identify a CSC where the surface treatment has degraded to the point where it should be replaced. The CSC can still be used but sensitivity will be 30-40% reduced.



*Figure 1: CSC installed on an ICP-OES that has been used for 18 months. The surface treatment is still effective: the inner surfaces of the CSC are wetted effectively and are similar in appearance to that of a glass cyclonic.*

Figure 1



*Figure 2: An untreated CSC installed on the same ICP-OES. Discrete droplets can clearly be seen, and the surface is not “wet”. A CSC with degraded surface treatment would look very similar.*

Figure 2

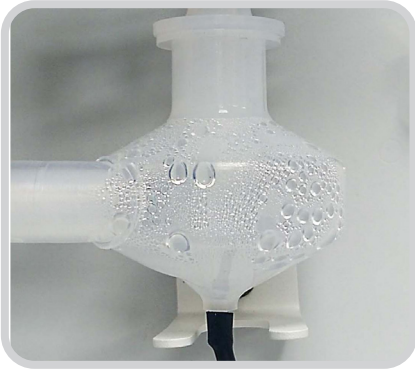


Figure 3

Figure 3: This is a surface treated CSC after very heavy use (all day, every day, over two shifts) running high matrix sodium fusions and HF (worst case scenario). The surface treatment degraded at 12 months. Discrete droplets can clearly be seen, and the surface is not "wet". The CSC can still be used but sensitivity will be 30-40% reduced.