

## Cost comparison: PTFE vs. PFA in Semiconductor Manufacturing

Fluoropolymers are widely used in the semiconductor manufacturing process due to their chemical inertness, wide temperature working range and low trace metals content.

PFA (Perfluoroalkoxy alkane) components are cleaner with respect to trace metals than PTFE (polytetrafluoroethylene). PFA, unlike PTFE, is melt processable. PFA can also be heated until molten and then formed into a final shape by injection molding or blow molding.

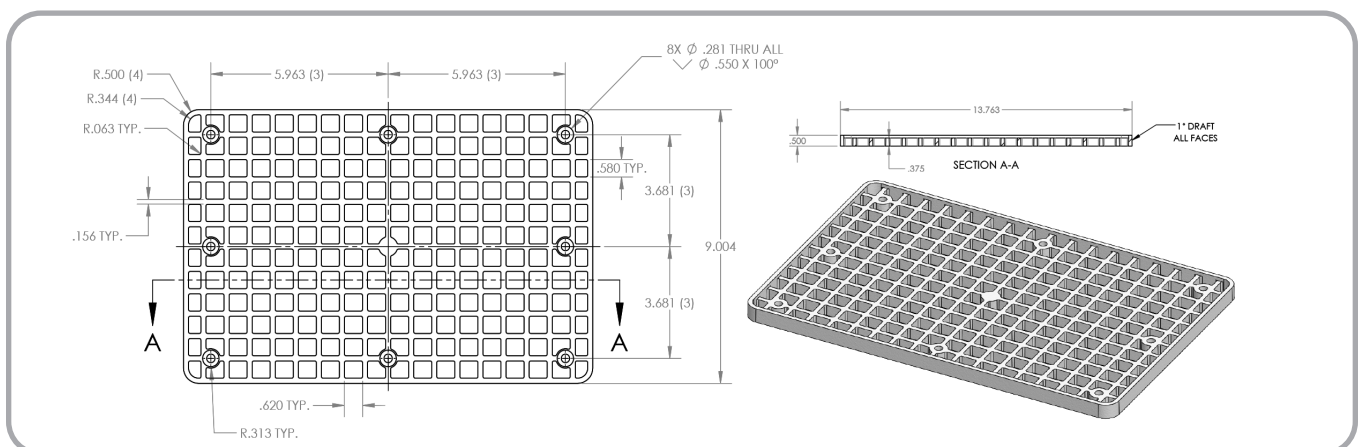
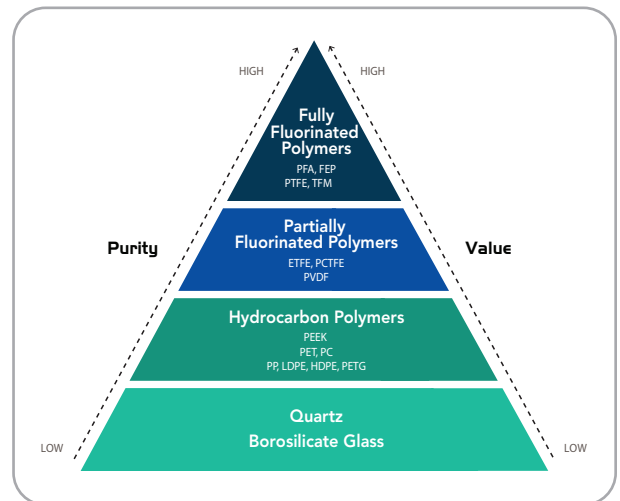
PTFE, on the other hand, must be machined or compression molded – both of which are expensive, time consuming and inherently “dirty” operations.

Producing PFA components through injection and blow molding does come with upfront costs for tooling. However, depending on the number of parts needed annually – and the part’s complexity – a cleaner, molded PFA part will, in most cases, be cheaper than a machined PTFE part.

## Machining vs. Molding: A Real World Example

Our customer, a semiconductor manufacturer, was having the grid-shaped part below machined from a block of PTFE (of unknown trace metals content).

The part measures 13.76" x 9.00" x 0.50" (349 mm x 228 mm x 12.7 mm).

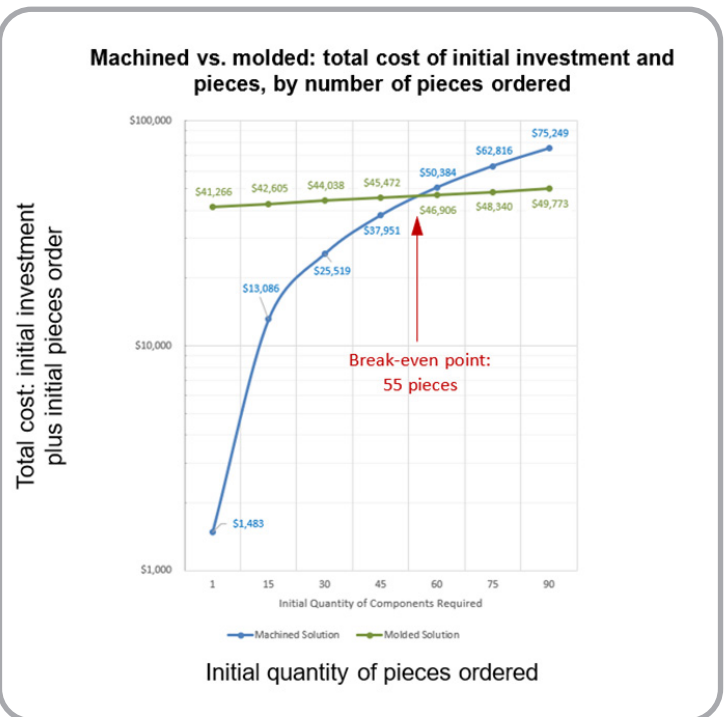


Machining the part from PTFE avoided the initial custom tooling investment required for molded PFA, but producing the part still proved expensive. The unit cost per part totaled \$1,483. However, our customer was able to purchase 90-part batches for \$49,733, which lowered the unit cost to \$836.

Switching to a molded PFA part from Savillex required an upfront investment of \$41,266 for the tooling – which our customer then owned – and for the first part. Overall, the tooling, plus 90 parts totaled \$75,249, which meant that 89 additional parts cost only \$382 each to produce.

This chart demonstrates how the break-even point for a molded PFA part is 55 pieces, after which the PFA solution becomes less expensive.

In this case, our customer recouped their initial tooling investment very quickly with the molded PFA solution. In addition, the customer also received a part molded from the highest purity grade virgin PFA resin, with zero fillers or additives.



## Your Partner in Custom Molded PFA

With over 40 years' experience in molding fluoropolymers, Savillex can advise customers on the absolute best grade of PFA resin for their use, or the customer can specify which resin quality they want.

We also routinely test the PFA resins we use for extractable metals using high resolution ICP-MS (Inductively coupled plasma mass spectrometry).

In comparison, with PTFE, it can be very difficult to know the cleanliness of the starting material, or what contaminants may have been imparted by the machining process.

Do you have a specific PFA part or project in mind? See how much you could save by requesting a quote today.