

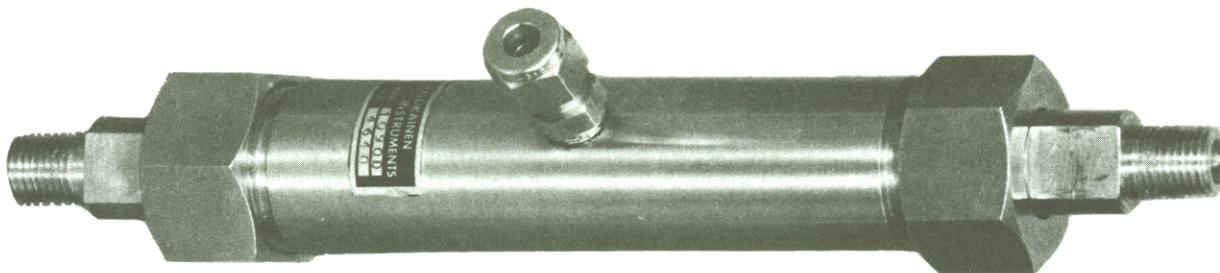
## SELF CLEANING IN-LINE FILTER

*Shell Development Co. Design*

**Model 1090**

The Hallikainen-Shell Self Cleaning In-Line Filter, features:

1. In-line design providing self cleaning action and reduction of sample residence time in process stream analyzer sampling systems.
2. Stainless steel construction throughout.
3. Filter elements available in seven pore sizes — particle removal ratings from 2 to 55 microns.
4. Low pressure drop through filter element.



The Hallikainen-Shell In-Line Filter was designed to fulfill the requirements for a self cleaning filter to be used in conjunction with all fluid stream analyzers. The element consists of a hollow tube, made of fused alumina or stainless steel. The element is enclosed in a cylindrical stainless steel enclosure, a small annulus thereby formed between the enclosure and the filter tube. A high velocity stream of the sample to be analyzed passes through the hollow portion of the tube with the actual sample used in the analyzer passing through the wall of the filter element and withdrawn at the sample outlet fitting (see Fig. 1). This method of filtering has the following advantages:

1. The filter is essentially self cleaning since the stream contaminants deposited on the inner wall of the filter are swept away by the high velocity large volume stream contacting the inner walls of the filter element.
2. Sample dead time to the analyzer is reduced due to the high volume flow through the filter and extremely low residence time.

### SPECIFICATIONS

Length — 9 inches over-all  
Diameter —  $1\frac{3}{8}$  inches maximum (not including sample outlet fitting)  
Weight — 2 pounds  
Pressure Rating — 1,000 psig  
Slipstream Inlet and Outlet Fittings —  $\frac{1}{4}$ " NPT  
Sample Outlet Fitting —  $\frac{1}{4}$ " or  $\frac{1}{8}$ " Tubing Fitting (specify one)

When ordering, use model number 1090 and add  $\frac{1}{4}$ T ( $\frac{1}{4}$ " tubing) or  $\frac{1}{8}$ T ( $\frac{1}{8}$ " tubing) depending on the size of the sample outlet connection required; also specify filter element desired.

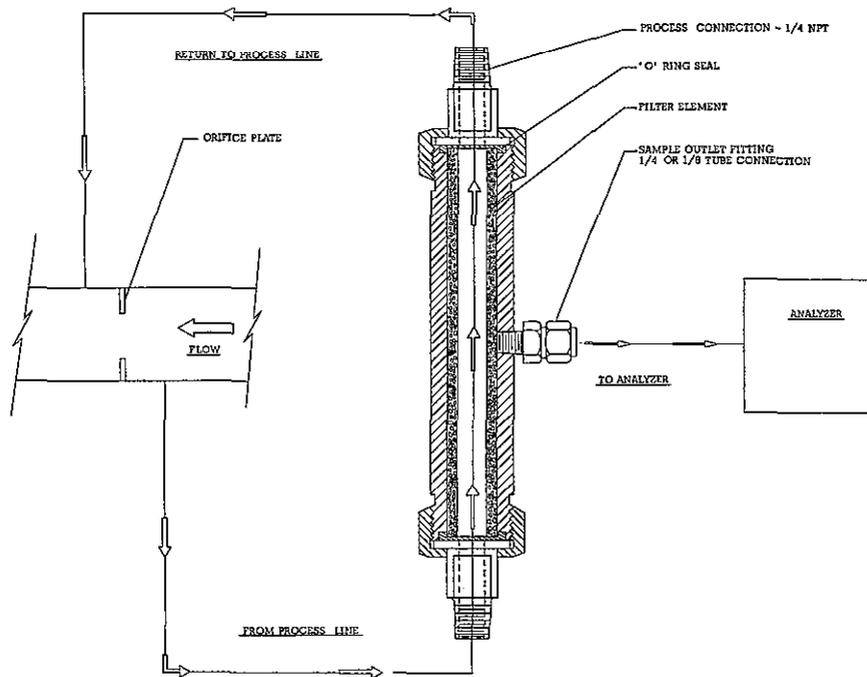


Figure 1 — Typical Flow Diagram

**MATERIALS OF CONSTRUCTION**

Filter Body — Material in contact with liquid of 316 stainless steel, otherwise 303 stainless steel

"O" Ring — Viton A

Filter Elements —

Material	Mean Pore Size (Microns)	Removal Rating (Microns)
Fused Alumina (Alundum)	20	7 - 14
Sintered Stainless Steel	165	55
" " "	65	22
" " "	35	12
" " "	20	7
" " "	10	3
" " "	5	2

The fused alumina (alundum) element is the standard element.

The other elements can be supplied on special order.

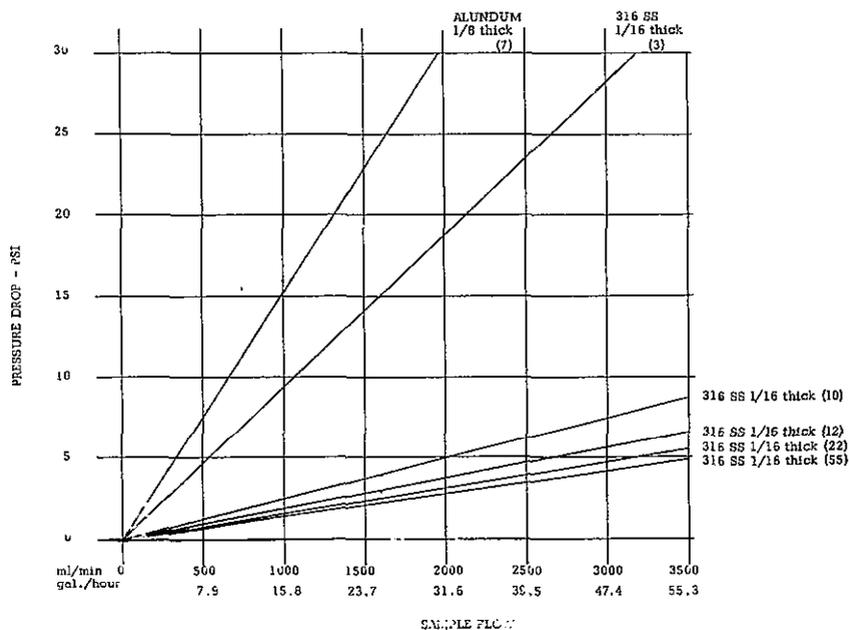


Figure 2 — Filtered Flow for Various Filter Elements. All values are based on water as sample fluid. The results are for normally clean elements.