Pall Corporation

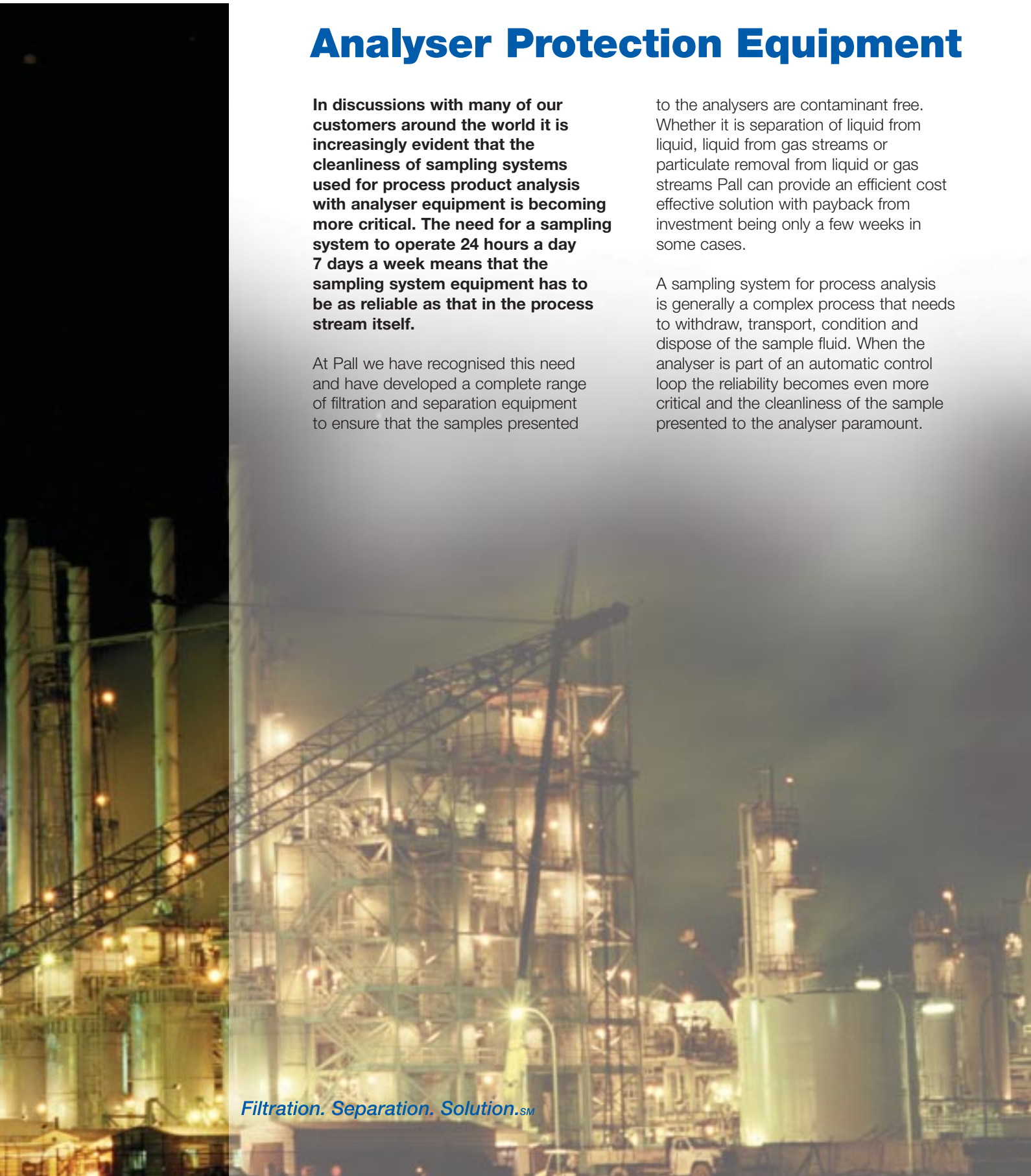
GDS125

# Analyser Protection Equipment

**In discussions with many of our customers around the world it is increasingly evident that the cleanliness of sampling systems used for process product analysis with analyser equipment is becoming more critical. The need for a sampling system to operate 24 hours a day 7 days a week means that the sampling system equipment has to be as reliable as that in the process stream itself.**

At Pall we have recognised this need and have developed a complete range of filtration and separation equipment to ensure that the samples presented to the analysers are contaminant free. Whether it is separation of liquid from liquid, liquid from gas streams or particulate removal from liquid or gas streams Pall can provide an efficient cost effective solution with payback from investment being only a few weeks in some cases.

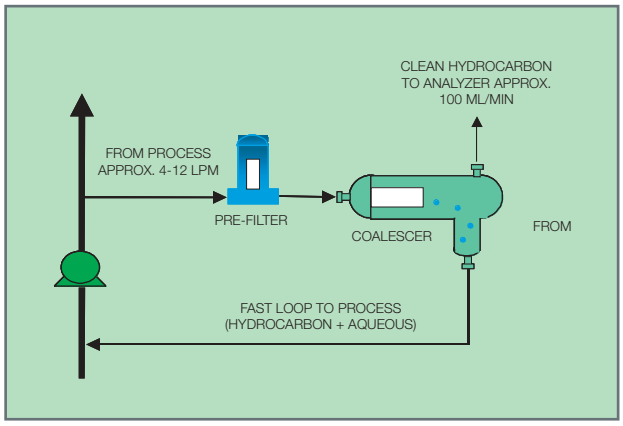
A sampling system for process analysis is generally a complex process that needs to withdraw, transport, condition and dispose of the sample fluid. When the analyser is part of an automatic control loop the reliability becomes even more critical and the cleanliness of the sample presented to the analyser paramount.



*Filtration. Separation. Solution.*SM

## Pall experience to date

### Gasoline blending



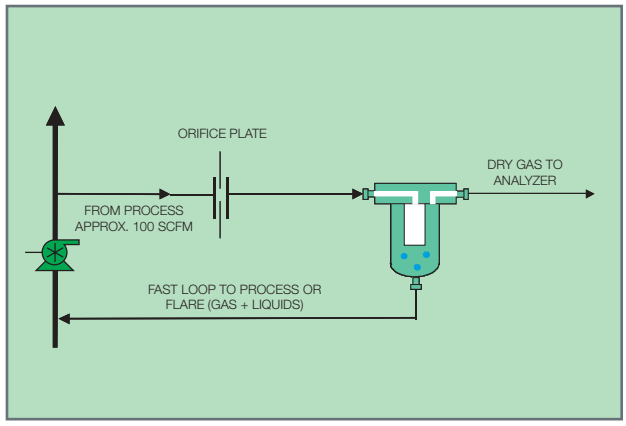

The presence of caustic water in the sampling system caused fouling of the on-line n-IR (near-Infra Red) analysers for gasoline blending. The system employed both feed forward and feed back loops to control blending. The feed forward loop analysers were being by-passed due to salt fouling so that the refinery was relying solely on the feed back loop to control blending. Tweaking the Dew point of the feed back loop stream controlled the salt fouling on this analyser. Pall installed a particulate pre-filter on to a liquid/liquid coalescer in place of existing equipment. The feed forward loop was now operating for the first time and the Pall solution eliminated product losses due to poor blending. Payback period on this particular system was calculated as 1 week.

In this case a Pall® PhaseSep® cartridge LCS06H1AH with a **Pall** Nylon Profile® 10 micron absolute prefilter RGN05FN100 were used.

Pall currently have over 100 similar installations operating successfully around the world.

Another option successfully used in blending applications is the use of a hydrophobic membrane. This should be used in applications where water may be present but generally the service is dry or almost dry.

### Fuel Gas




A Canadian refiner was experiencing short filter life and routine fouling of a sulfur in gasoline analyzer. The filter used was a flat sheet hydrophobic membrane about 50 mm (2 inches) in diameter. A **Pall** Emflon® PF part number MPF4463F002ESTH11 was installed. Analyzer maintenance was dramatically reduced. The **Pall** filter was removed for inspection by Pall SLS after 11 months of service and was found to be in new condition in terms of degree of plugging and removal efficiency.

Amine and heavy hydrocarbons was causing fouling of on-line gas density meters and chromatographic analysers making them inoperable.

Pall installed a high efficiency LG Coalescer on four fuel gas streams. No more analyser fouling and an improved gas quality has been seen as a direct result of the **Pall** installation. Payback in this case was estimated at a few weeks.

In this case a **Pall** LG Coalescer CC1LGB7H was used.

## Particulate Filters

On the previous pages the examples of the **Pall** solution were provided after consultation with our customers. In some cases there may be only trace liquids present in which case we may recommend a hydrophobic membrane as the optimum solution. In some cases the contaminant may only be particulate matter in which case product from Pall's extensive range of absolute rated cartridge filters may the recommended solution.

In all cases we will always recommend the optimum solution with regard to efficiency, temperature/chemical compatibility, life requirements and contamination levels of the sampling systems being conditioned. A selection of one or more of the following **Pall** products may be used: - Ultipor GF Plus®, Porous metal, **Emflon**, Poly-Fine®, Nexis® and Duo-Fine® cartridges.

### Profile

**Profile** II Polypropylene, Nylon and PPS Cartridges. Depth filter matrix makes this cartridge ideal for Gel and deformable contaminant removal.
Absolute removal ratings from 1 to 120 micron. Maximum working temperatures to 205ºC depending on media.

### Glass Fibre

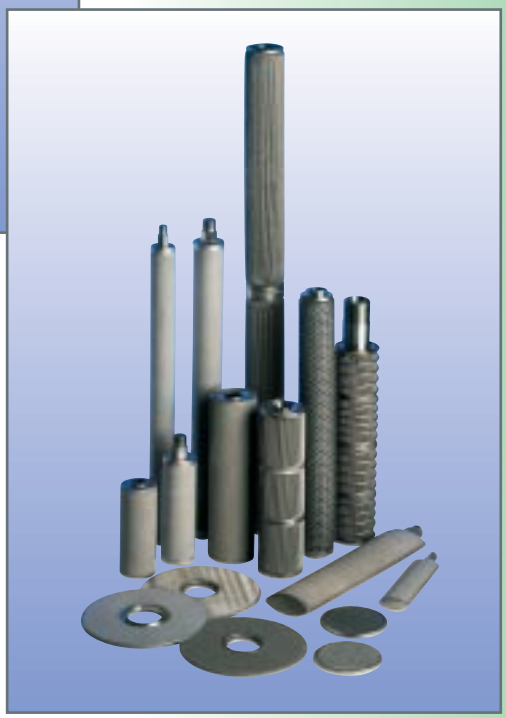
**Pall** Ultipor GF® & **Ultipor GF Plus** cartridges consist of a resin bonded Glass fibre medium encased between 2 layers of Polyester with Polypropylene hardware. The large filter area gives lower clean differential pressure and longer on stream life.

### Emflon®

**Pall Emflon** cartridges are manufactured using a proprietary pleated hydrophobic PTFE membrane, make this ideally suited as a liquid barrier in gaseous services where the liquid concentrations are very low with the possibility of very fine particulate contamination.

### HDC® II

The all polypropylene pleated cartridge utilises our proprietary technique of varying fibre diameter to produce a pore size distribution from coarse upstream layers to fine absolute rated downstream layers. This unique construction means that more contaminants are trapped within the matrix of the media to increase dirt capacity and on stream life.



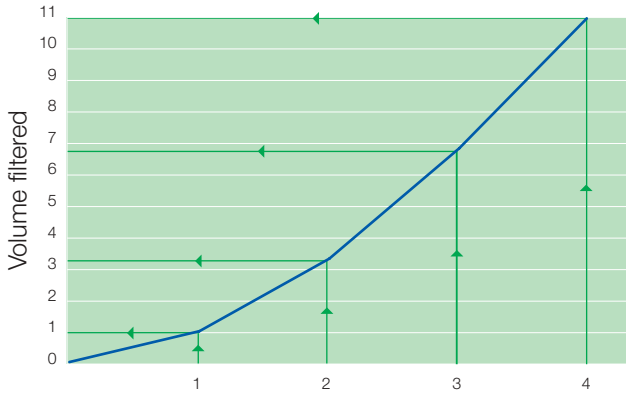
### Porous Metal

Pall's extensive range of porous metal filters, with removal ratings ranging from 2 micron to 1 mm, are manufactured using the Pall proprietary sintering process from powder and wire mean that we can propose a solution in most high temperature applications where metal filters are required.

## Surface Area

In many cases the filter can be undersized and this may result in a number of filters being put in series to “fix” the problem. We at Pall ensure that enough surface area is proposed at the beginning to ensure a realistic filter life for the unit.

In the blending application mentioned previously on page 3 the surface area of the **Pall** hydrophobic membrane cartridge was approximately 120 times the surface area of the flat sheet. This increased surface area provides longer filter life and improved water rejection.




### What do you get with a bigger surface area?

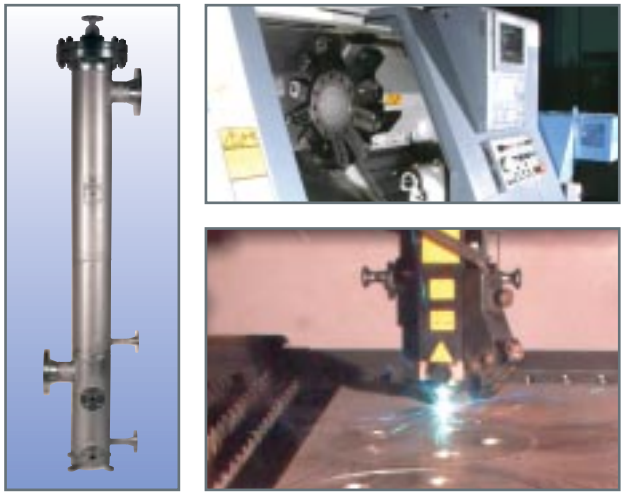
This graph represents the exponential relationship between the volume of liquid filtered and filtration area under constant flow and media permeability conditions. The exponent of the relation has been empirically determined to be between 1.5 and 2.0.

Therefore, doubling available filter area should essentially extend service life from 2.8 to 4.0 times.

## Pall Housings

All **Pall** filtration and separation equipment is manufactured in several locations around the globe so that continuity of supply is maintained the coalescers and cartridges specified in this brochure will have the same part numbers wherever they are supplied from.

The housings that the coalescers and cartridges fit into are manufactured locally to take account of local specifications and requirements. In this case the housing part numbers may be different to differentiate these local requirements.



PALL® Fuels and Chemicals

**New York - USA**

888 873 7255 toll free in the USA
+1 516 484 5400 phone
+1 516 484 0364 fax
fuelsandchemicals@pall.com

**Portsmouth - Europe**

+44 (0)23 9230 3303 phone
+44 (0)23 9230 2506 fax
fuelsandchemicals@pall.com

### Visit us on the Web at www.pall.com

Because of developments in technology these data or procedures may be subject to change. Consequently we advise users to review their continuing validity annually.

**Pall Corporation has offices and plants throughout the world in locations including:** Argentina, Australia, Austria, Belgium, Brazil, Canada, China, France, Germany, Hong Kong, India, Indonesia, Ireland, Italy, Japan, Korea, Malaysia, Mexico, the Netherlands, New Zealand, Norway, Poland, Puerto Rico, Russia, Singapore, Spain, South Africa, Sweden, Switzerland, Taiwan, Thailand, United Kingdom, the United States and Venezuela. Distributors are located in all major industrial areas of the world.



CS4M/042004