



## Produced Water Filtration PFI Nut Shell Filters

**PS Filter is proud to introduce the next generation of automated, self-cleaning granular nut shell media filter.**

Designed and fabricated by Products Fabrication Inc., the PFI Nutshell Filter is a unique design that outperforms any other granular media filter. No other filter – sand, nut shell, or mixed media – has the ability to fluidize and fully suspend the media and contaminants for media regeneration. By using a properly designed mixer and wedge wire screen assembly, we are able to fully fluidize and clean the filter media, each and every cycle, guaranteed. This design is what makes the PFI Nut Shell Filter a step above all the rest. The filter design has been selected as the best available technology in many produced water filtration applications, and has been utilized to remove oil and grease, as well as suspend solids from a variety of heavy oil and other oilfield produced water streams.

The significant benefits include:

**Compact Design** – Filtration units are skid-mounted for ease of installation and come complete with all the required components for automatic operation.

**Unique Backwash Concept** – By using the mixer technology, the filter can guarantee complete fluidization of the nut shells and contaminants. No other technology can guarantee this.

**Filter Media** – The black walnut shell media is chemically inert, hard, and extremely resilient. Black walnut shell filter media is preferentially water wetted. Perfect for oily water processing.

**Throughput Efficiency** – Higher flow-rates and short, efficient backwash cycles mean less than ½% of the daily throughput is waste.

**No Auxiliary Backwash Equipment** – Process water is used for the backwash supply water, therefore separate clean water sources, storage facilities or other ancillary equipment is not required.

**Minimum Backwash Volume** – The PFI Nut Shell Filter uses the least amount of backwash volume of any granular media type filter.

**Media Replacement** – Under normal operation no regular media replacement is required (typical media life is 15-20 years, with 1-2% attrition per year).

**No Chemical Consumption** – Normal operation requires no chemicals for filtering and no surfactants or additives to assist in the media scrubbing (Back washing).



*Portable Nutshell Filter capable of flow throughput of up to 20 m<sup>3</sup>/h. Skidded unit comes complete with all instrumentation and controls installed.*

### Performance:

95 – 98% suspended solids removal

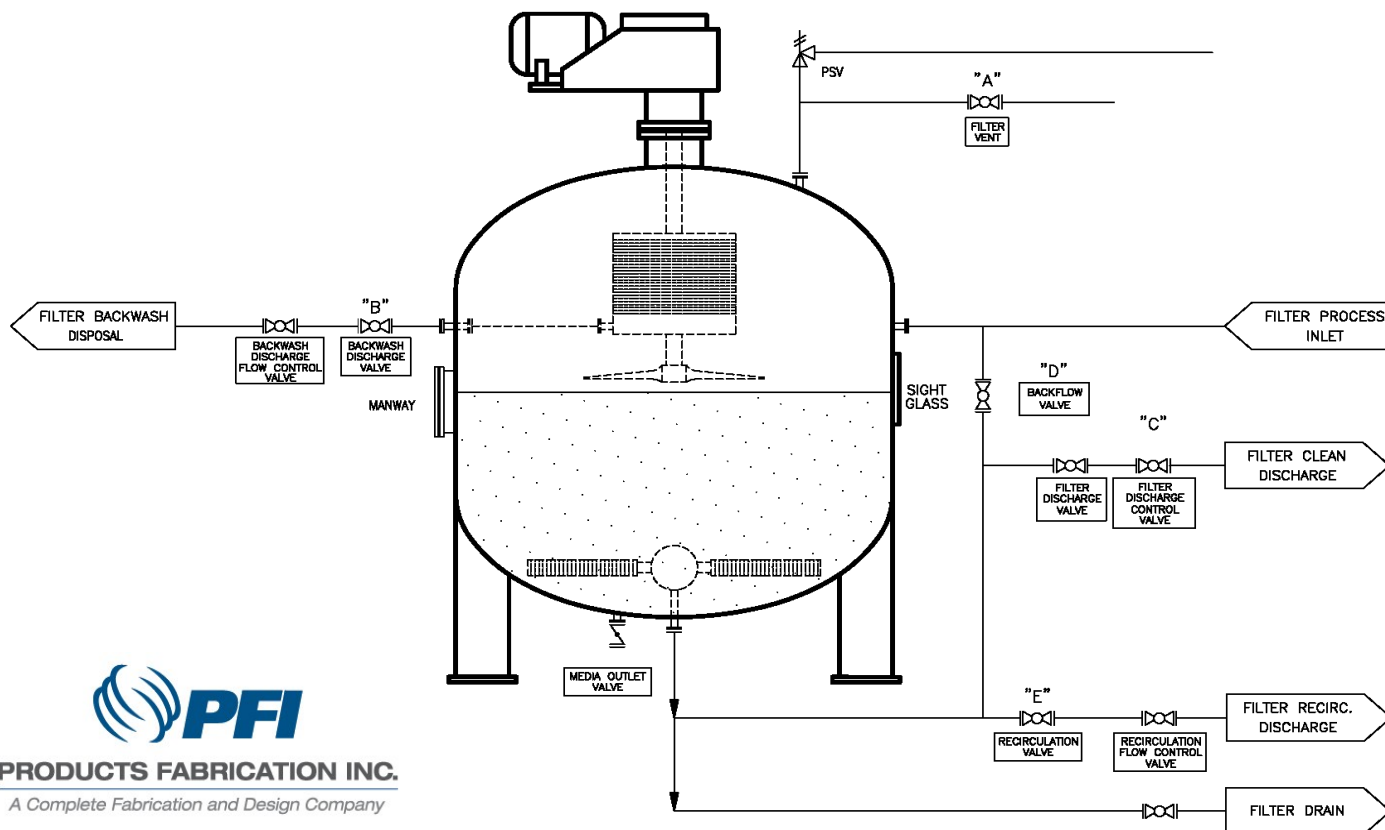
90 – 99% insoluble HC removal

### Product Range:

Single unit capacities range from 11 m<sup>3</sup>/h (1,700 BWPD) to over 1100 m<sup>3</sup>/h (171,000 BWPD).

Vertical vessel sizes range from 1m (3 ft) dia to 4 m (13 ft) dia. Horizontal vessel design also available in 3.6 m (12 ft) dia and up to 10 m (30 ft) in length.

# FILTRATION OVERVIEW



**PRODUCTS FABRICATION INC.**

*A Complete Fabrication and Design Company*

PFI Nut Shell Filters are down flow, deep bed, walnut shell media filters designed for oily water filtration. As the liquid passes through the media bed, oil and solids are efficiently retained in the bed, and can then be easily backwashed out of the media bed with the internal stationary media scrubbing assembly. This backwash assembly utilizes a standard agitator with a highly efficient impeller which is the best technology available for fluidizing the media bed. There is not one pump design nut shell filter made that can fluidize granular media like this design. No chemicals, surfactants, or air sparge cycles are required for the backwash.

In produced water and waste water applications, PFI Nut Shell Filters are used to remove suspended solids and insoluble hydrocarbons. Some applications include: water softener protection for steam flood, water re-injection for production or disposal, SAGD softener protection, and water for agriculture use.

The media scrubbing cycle prevents filter media bed fouling. Unique to PFI Nut Shell Filters is a media scrubbing cycle that fully reconditions the filter media during each backwash cycle. This scrubbing cycle is initiated automatically, whenever the filter bed becomes dirt-laden. A change in pressure differential across the filter bed, or an automatic preset time signal, activates backwashing.

The current design incorporates the high intensity of a mixer to vigorously agitate the media bed during the media regeneration cycle. The mixer is combined with the separating efficiency of a wedge wire backwash scrubber screen to produce the optimum separation of the scrubbed media from the concentrated backwash fluids.

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