

Cartridges for Water Removal from Aviation Fuel

I Series Coalescer



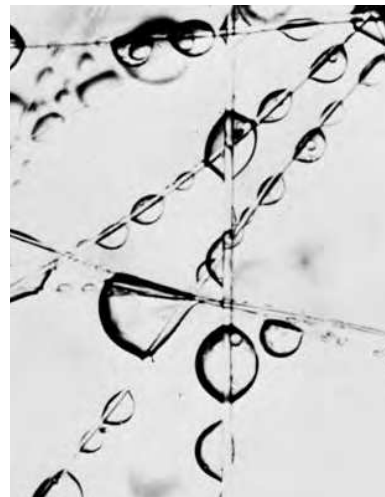
FEATURES:

- Cost effective particle and emulsified water removal from hydrocarbon fluids
- Easy installation and replacement with one-piece design
- Choice of Threaded Base or Open End cartridges
- Choice of All-Fiberglass Media or Combination Fiberglass and Pleated Media
- Field proven performance
- Ongoing qualification testing to meet changing commercial and military requirements
- Used as a first-stage cartridge in Filter/Separator
- Remove particulates and coalesce water into large water drops

HOW COALESCERS WORK:

Coalescer cartridges are employed as the first stage in filter/separator vessels for hydrocarbon fluids. They perform two functions: (1) coalesce (combine) highly dispersed, emulsified water particles into larger water drops and (2) filter-out particulate contaminants.

The left photo below shows a highly magnified view of the coalescing process. Tiny droplets of water contact and adhere to strands of fiberglass. Flow pushes the droplets along the strand



Photomicrograph of coalescing process inside fiberglass media.

until they reach an intersection of strands where they combine with other droplets (coalesce) into large drops.

These large drops are then carried to the outside surface of the cartridge. Having a higher specific gravity than the hydrocarbon fluid, they release and gravity pulls the droplet to the bottom of the vessel. The larger the drops, the faster and more efficiently they fall out (see bottom photo). In general, particle removal efficiency increases



Coalesced water drops releasing from the knitted sock at the outside surface of the cartridge.

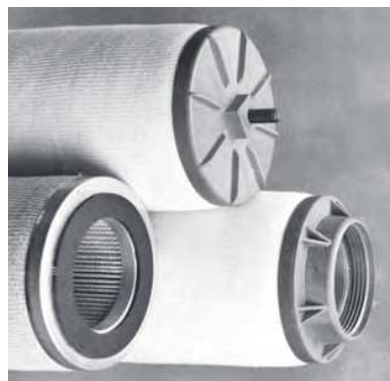
with coalescing efficiency. This is accomplished by employing a tighter, finer filtration media.

Flow direction is from inside to outside of the cartridge. This minimizes surface velocity and helps prevent the water drops from breaking up and being carried downstream.

APPLICATION

Coalescer cartridges are used primarily to coalesce emulsified water and remove particles from hydrocarbon fluids. The largest single application is the filtration of aviation jet fuel. They are also used with other types of fuels, process streams in refineries and petrochemical plants, and condensate streams where natural gas is produced.

Other liquids can be separated if they are immiscible, the specific gravities differ, and high concentrations of surface active agents are not present. As a rule of thumb, if a sample of the mixture readily separates in an hour or two, a coalescer can probably be used. If the mixture hasn't separated after 24 hours, coalescing probably won't work.



6" Diameter Threaded Base and Open End Coalescer End Caps

CONSTRUCTION

Parker Velcon single-unit coalescer elements are offered with Threaded Base or Open Ends and with Fiberglass Media or Fiberglass and Pleated Media combinations.

Threaded Base Coalescers are recommended for use in most applications. They simplify installation and replacement by eliminating the need for cover plates, center plates, nuts, washers, and gaskets. They are for use in Parker Velcon and other make filter/ separators. Threaded base adapters are available to convert vessels presently using open end elements.

Open End Coalescers are offered with single unit construction which reduces the number of gasket seals and improves overall reliability.

All-fiberglass Media Coalescers combine depth particulate filtration with a deep coalescing structure. All-fiberglass designs have successively finer media layers to achieve depth-type filtration of particles.

Combination Fiberglass and Pleated Media Coalescers remove particles primarily in the high surface area pleated core. They have one or more layers of pleated media inside a cylinder of molded fiberglass laminations to provide an extended surface area for particulate filtration. Pleat corrugation and separation materials are used to keep pleats open for full utilization.

Coalescing and filtration performance depends largely on the fiber diameter and bulk density of the fiberglass media. Both the All-Fiberglass and the Combination coalescer cartridge designs incorporate phenolic resin impregnated fiberglass media. Several grades with fiber

diameters ranging from 1 to 10 microns are used in various combinations to achieve desired results. Parker Velcon coalescer designs (85, 87 and C5 series cartridges) achieve even higher filtration and coalescing efficiency by incorporating pure micro-glass fibers with diameters of less than 1 micron in the pleated media.



All-Fiberglass "6" Series Coalescer



Fiberglass and Pleated Media "87" Series Coalescer



6000T Threaded Base Adapter

DESCRIPTION

Model Number System.

Refer to the box at right. The one or two digit Series Designator relates to the approximate micron rating of each model coalescer cartridge. Note that this is a nominal rating and should be used for reference only.

The “0”, “2”, and “4” Series all-fiberglass cartridges are rated at 25, 5, and 3 microns respectively. The “2” and “4” Series are commonly used with diesel and other fuel oils, and are a compromise between filtration efficiency (cartridge life) and water removing capability. They coalesce gross water, but normally do not remove fine water haze.

The all-fiberglass “6” Series was originally developed for jet fuel service (the original MIL-F-8901 specification). With a 2-micron rating, it has proven to be the most cost effective design in some jet fuel applications. “6” Series cartridges are also used in gasoline filtration service. However, it should be noted

that the powerful detergent additives in most automotive gasolines reduce the coalescing capability of this and other cartridge designs.

“83” Series Cartridges.

The 1-micron rated “83” Series is a pleated media/fiberglass cartridge. The very practical “83” Series cartridges have become the most widely used design in applications including gasoline, condensate, and insulating oil filtration.

“85” and “87” Series Cartridges.

The “85” Series is rated at 0.5-micron while the “87” Series is rated at 0.3 micron. Both incorporate multi-layered pleated media. The “85” Series has consistently shown superior dirt holding capacity in the field.

JF5 Series Coalescers.

JF5 Series Cartridges are Parker Velcon’s newest design. Combined with V5N5 Series Separators, they offer higher flow rates and extended service life.

EI* 1581 6th Edition Cartridges.

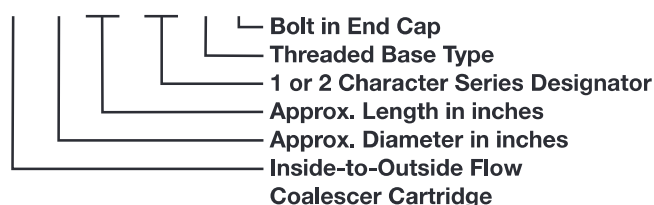
I-6xxC5 (TB), I-6xxMM, and I-6xxA4 Series of coalescers incorporate a multi-layered pleated media designed to provide superior dirt holding capacity in the field, combined with 0.4 micron efficiency. The I-6xxC5 (TB) replaces both the I-6xx85 (TB) and I-6xx87 (TB) cartridges. These cartridges are available in either threaded base or open-end configuration. See pages 7, 20 & 21 for more specific information on EI 1581 6th Edition.

Cartridge Dimensions. 6” diameter cartridges are the current industry standard. They are offered in lengths of 11”, 14”, 22”, 28”, 33”, 38”, 44”, and 56”. However, not all series are available in all lengths or in both end cap designs.

4” diameter cartridges are also offered for use with older equipment. They are available in a variety of lengths ranging from 8 to 40 inches.

Parker Velcon Model Numbers include significant product information. **Example:**

I - 6 2 8 C 5 T B



Note that **I-628C5** would designate the open end version of this cartridge.

GENERAL SPECIFICATIONS

- 75 psi maximum pressure differential rating
- 5 to 9 pH range
- 250°F (121.1°C) maximum operating temperature
- Aluminum center tube
- Buna-N gaskets
- Injection molded end caps are standard on 6” diameter threaded base coalescers;
- Aluminum end caps are standard on 6” diameter open end cartridges
- All 6” diameter cartridge end caps are bonded directly to the media with high strength epoxy or urethane
- 4” diameter cartridge have molded polyester resin or injection molded end caps

*EI (Energy Institute) is the new specification authority. API (American Petroleum Institute) is no longer involved in aviation fuel filtration specifications.



EI1581 6TH EDITION QUALIFIED COALESCERS

The I-6xxC5 (TB), I-6xxMM, I-6xxA4, and I-6xxJF5 (TB) Series coalescers ("xx" denotes nominal cartridge length) incorporate multi-layered pleated media designed to provide superior dirt holding capacity in the field, combined with 0.4 micron efficiency. The I-6xxC5(TB) replaces both Parker Velcon's I-6xx85(TB) and I-6xx87(TB) cartridges. These cartridges are available in either threaded base or open-end configuration.

CATEGORY FUELS

Parker has tested and qualified a comprehensive range of products to meet the EI 1581 6th Edition Specification.

CATEGORY C

This category replaces the previous class A, B, & C of EI 1581 Third Edition. Parker Velcon's new coalescer cartridges that meet Category C requirements are the I-6xxC5 Series ("xx" denotes nominal cartridge length). These cartridges have been developed to provide better water removal performance in surfactant-laden fuels, and improved filtration efficiency combined with longer life. Category 'C' cartridges can be used at any point in the fuel distribution system - from refineries to into-plane fueling.

CATEGORY M

This category covers military fuels, such as JP8 (similar to Jet A but containing anti-icing and other additives). Parker Velcon's coalescer products for this category are the I-6xxMM Series cartridges.

Category M qualified cartridges also qualify for Category C.

CATEGORY M100

This category is for military fuels such as JP8+100. The '+100' additive allows fuels to run at higher operating temperatures and reduces maintenance for high performance military jet engines. Parker Velcon's coalescer cartridges for the M100 Category are the I-6xxA4 Series.

ADDITIONAL INFORMATION

The 6th Edition also allows operators to incorporate third stage filter cartridges with each category. Parker has currently qualified the CDF®-2xx Series monitor (water absorbing) cartridges for Category C and the FOW-2xx Series filter cartridges for Category M100.

Another aspect of the EI 1581 6th Edition specification is the description of filter/separators as Type S (water and dirt), Type S-LW (for applications where low amounts of water are expected) and Type S-LD (for applications where low amounts of dirt are expected). Products qualified for Type S are also qualified for Types S-LD and Type S-LW.

To obtain your authorized Parker EI 1581 6th Edition Similarity Data Report for existing vessels, please complete the Similarity Certification form (VEL1728 or page 22).



I-614C5TB Coalescer



EI 1581 6th Edition Separator and Coalescer