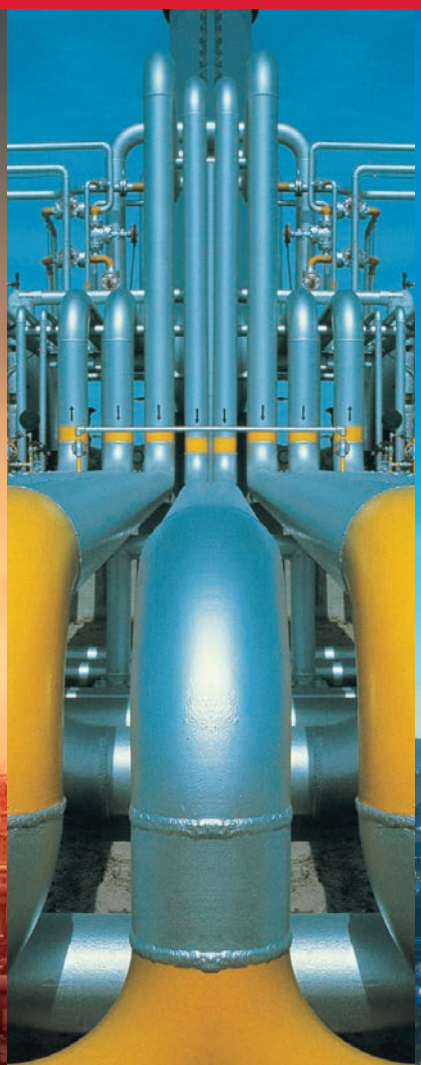
The Hilliard HilCO FILTRATION DIVISION **Advantage**

Superior
Pleated Cartridge Filter Elements

FILTRATION SOLUTIONS FOR



- Hydrocracking
- Hydrotreating
- Amine Sweetening
- Sulfur Recovery
- Catalytic Cracking
- Catalytic Reforming
- Finished Product
- Equipment Reliability

At HILCO® we know filtration.

We've seen many changes since our first oil reclaimer was built in 1925. The problems have become more complicated and the filtration techniques more sophisticated. Hilliard is first and foremost an engineering company. Every one of our products has been developed and tested by our dedicated engineering staff to bring fluid contamination problems under control.

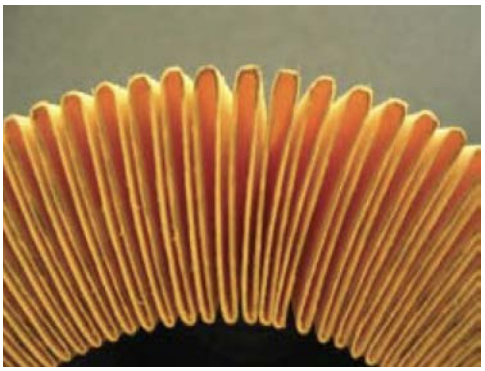
- **On-site lab for oil analysis**
- **Welding and manufacturing to code**
- **Turn-key package systems**
- **Cradle to grave manufacturing of vessels and cartridges**

Hilliard HiLCO FILTRATION DIVISION
100 YEARS
Established 1925

We're confident that we can provide a solution for your fluid contamination problem. Let us help you decrease your disposal costs and increase your profits.

Filter Media Platform
(Depth vs. Pleated)

Brand X — Flat Pleats



HILCO® — Radial Pleats

Media Platform

The media is the heart of the filter cartridge which actually performs the solids separation. The media must withstand the high flow, harsh corrosive environment of acid gasses, water and chemical solvents and effectively remove heavy solids without being cost prohibitive. HILCO® filter cartridges are pleated and provide higher surface area than comparable depth cartridges of the same volumetric size. The media is pleated with **controlled-radius pleats**, which are uniformly spaced pleats that maximize effective filtration area and dirt holding capacity, and resists bunching, distortion and rupture. Hilliard's unique manufacturing process forms larger radius pleats on the outside diameter with smaller radius pleats on the inside diameter which stabilizes pleat geometry. This feature permits lower pressure drops with higher dirt capacities than those with sharply pleated media.

Available Media Compositions

Pure Cellulose Fibers are very inexpensive but tend to swell when exposed to a high degree of water, resulting in a reduced dirt capacity and shorter service life.

Pure Polypropylene Fibers are very cost prohibitive and have a tendency to blind when exposed to hydrocarbons, resulting in a sharp reduction in service life in this application.

Pure Synthetic Blends are unaffected when exposed to hyrdrocarbons, however do not offer the dirt holding capacity of cellulose.

Hilliard's Proprietary Media Composition can be formulated specifically for individual types of service — amine, gas, oil, naptha, to offer the dirt holding capacity of cellulose fiber with the structural integrity of synthetic borosilicate glass and polymeric fibers that are cost effective and unaffected when exposed to moisture and hydro carbons. Packaged in a pleated format that reduces foaming with longer on-stream life than competitive brands.

NOTE: Colors are not representative of Actual Media

Hilliard HilCO® FILTRATION DIVISION

HILCO® cartridges have a reputation the world over for no-nonsense industrial strength quality and performance. They are engineered for durability in a tough environment to provide maximum performance at a moderate price. Because cartridge design is the key to filter performance, rigid inspection procedures ensure every cartridge performs up to its design expectations.

Cartridge Design

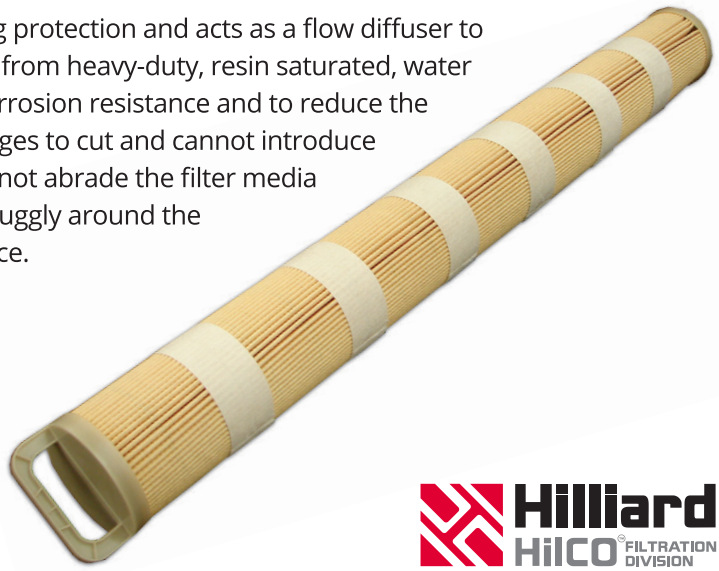
Self Supported and Coreless Designs

The center tube is the backbone of the cartridge. It supports the element both axially and longitudinally against the forces of pressure and flow. HILCO® tubes are plated for corrosion protection and designed to withstand up to 100 pounds of differential pressure or four times the working pressure the cartridge should normally encounter. HILCO® center tubes feature helical seams that quadruple the material thickness in the seam to give maximum strength with minimum weight.

HILCO® cartridges are assembled with the element tight against the center tube to gain full support from the tube. Some refill brands have a considerable gap between the tube and the element to speed their assembly process. Under pressure, any gap between the element and the supporting center tube will allow the element to be pushed in until it contacts the center tube and may allow the element to rupture from lack of support.

Ambient / Pleat Supporting Bands

The ambient is the outer protective jacket that provides handling protection and acts as a flow diffuser to maximize filter performance. The HILCO® ambient is perforated from heavy-duty, resin saturated, water resistant card stock. HILCO® uses a non-metal ambient for its corrosion resistance and to reduce the amount of disposable metals in the cartridge. It has no sharp edges to cut and cannot introduce hanging metallic burrs. The smooth perforations will not abrade the filter media that it protects. The HILCO® ambient fits snuggly around the element to firmly hold the pleats in place.



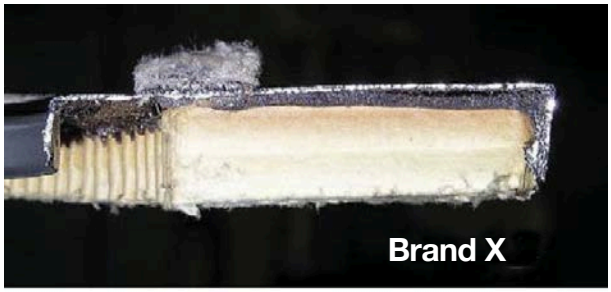
Hilliard HILCO FILTRATION DIVISION

Side Seam

The side seam results from wrapping an element around the center core to form a cylinder. The two longitudinal edges of the element are joined together in a seam running lengthwise to the cartridge. HILCO® cartridge elements employ two sealing methods for this side seam. The more open media utilizes a time proven double overlap that effectively seals the element seam. On the high efficiency media, the overlapped seam is filled with an epoxy sealant that actually soaks into and seals the media.

Adhesive Sealant

The urethane adhesive sealant is formulated to stand up to virtually any filterable fluid. Its function is to bond the end caps to the element and provide a leak-proof seal. To qualify, it must first pass a rigorous battery of temperature and compatibility testing. To effectively seal, the adhesive sealant must actually wet and soak into the media. Beware of plastisol adhesives that do not soak into the media and may permit bypass leakage between the plastisol and the element. Plastisols also may dissolve in some synthetic fluids.



End Caps

The cartridge end caps are part of the cartridge supporting structure. They must support longitudinal cartridge loading and provide a sealing surface. The end caps also hold the adhesive sealant that seals the elements. HILCO® end caps are either plated steel or molded heavy duty structural glass reenforced nylon.

Seals

The sealing arrangement ensures that 100% of the fluid flows through the filtering element without bypass leakage around it. HILCO® o-ring seals are available in various materials to match system compatibility demands. The o-ring version of the Process cartridge is unique in the fact that it is a redundant premium sealing system that provides back up seal integrity assurance in the event of a seal failure on the primary seal.

Brand X

HILCO®

Reliable & Efficient Solutions

BETA Rated

HILCO® uses Beta ratings to eliminate the confusion between nominal and absolute ratings. Media designations such as -5 and -12 are used to delineate one media grade from another. Each media grade has a Beta-rated efficiency with Beta ratios from 75 through 1000. ***The HILCO® range of media grades permits one to choose an optimum efficiency for virtually any particle size range.***

FEATURES & BENEFITS

- **Designed to withstand temperatures up to 250˚F**
- **Controlled-radius pleats maximize effective filtration area and dirt holding capacity**
- **High temperature designs available to 450˚F for steam out**
- **Designed to withstand pressures up to 100 PSI (Standard)**
- **High pressure design available — up to 250 PSI**
- **Composed of specially formulated filter media to provide the most effective combination of fluid particle separation, fluid compatibility and structural properties**

Test Units

HILCO® has portable units available for on-site testing. Please contact your authorized HILCO® distributor for more information.

HILCO® Filters and Systems are manufactured to the following Codes:

ASME (American Society of Mechanical Engineers)
API-614 (American Petroleum Institute)
AS1210 (Australia)
ATEX (Europe)
ISO (International Organization for Standardization)
97/23/EC (PED, Europe)
BS EN 10204 (British Standard)
CSA B51 (CRN, Canada)
DOSH (Malaysia)
NR-13 (Brazil)
Others: Special Certifications, Domestic Materials, etc.

HILCO® Laboratory Services

Hilliard Corporation's HILCO® division has over 90 years of experience designing filtration products that extend the life of the equipment used in industrial processes. Whether your need is fluid filtration and conditioning or fluid recovery, reclamation and restoration for re-use, HILCO® filters and filtration systems are used in applications across a wide range of industries.

The efficacy of our filtration research and development is supported by our commercially available HILCO® Laboratory Services. HILCO® Lab Services provide a full suite of rigorous world-class test capabilities to support industrial filtration and fluids analysis.

Our Laboratory Services are used in product development, evaluating potential customer problems or needs, and competitor performance.

Fluid Sample Analysis:

The Hilliard Corporation's Hilco® Laboratory Services Developmental Engineering Fluid Analysis utilizes a wide range of tests to evaluate a fluid's condition; the quantity and types of contaminants in the fluid; and the physical properties of the fluid.

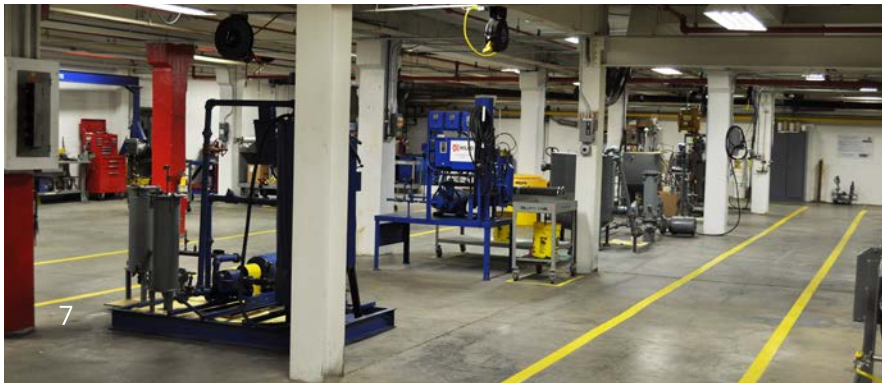
Contaminants in process fluids can lead to extreme wear on a system causing lower productivity and reliability, which can negatively impact revenue. Our in-depth process of analyzing fluid gives us the information needed to deliver "like-new" fluid restoration.

We can extend fluid use, increase system life, and maximize productivity, saving you time and money, and keeping you as an industry leader.

Filtration Media and Material Testing:

We take pride in our standard of excellence, and we uphold these standards by using an assortment of tests to provide valuable information and solutions to ensure the highest quality in filter media and cartridges.

The Hilliard Corporation's Hilco® Laboratory Services can identify critical physical properties of the filter media used in production cartridges, as well as the evaluation of potential new media to provide filter manufactures with the information needed to save them time and money while delivering supreme quality.



Hilliard
Quality | Innovation | Excellence
120 YEARS
Established 1905

We make the products you need with the quality you expect.

Since 1905, Hilliard has been engineering, manufacturing and distributing motion control, braking systems, and filtration products. Our extensive history, expert knowledge of applications and strict quality standards make us a leading industry supplier. Hilliard's large portfolio of products can be modified to meet new applications.

Located in Elmira, New York, and independently owned for more than four generations, the company has grown and prospered for more than a century.

FILTER CARTRIDGES | SIMPLEX AND DUPLEX FEED FILTRATION | CUSTOM GUIDE ROD ADAPTATION | DUPLEX FILTERS
CUSTOMIZED QUICK CLOSURES | PORTABLE FILTRATION | OIL MIST ELIMINATORS | CUSTOM DESIGNED VESSELS | VALVES

Hilliard HilCO FILTRATION DIVISION

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Hilliard Products are Made in the USA.

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