XtreamSorb®

PECO Series 14 Liquid Filter-Adsorber
Advanced Carbon Block Technology for Process Purification

ISO 9001

Parker

ENGINEERING YOUR SUCCESS.

LIQUID ADSORPTION USING CARBON BLOCK & PEACH®

The Series 14 is a two-stage filter adsorber utilizing a combination of outer PEACH filter media and an inner porous extruded carbon block. The activated carbon block maximizes hydrocarbon removal efficiency through extended surface area and eliminates carbon fines into the fluid stream. The PEACH technology filters particulate and absorbs hydrocarbons, extending the on-stream life of the carbon block it encases. The cartridge design provides an additional benefit in that it is lighter weight than a traditional carbon canister, and the Series 14 vessel offers a smaller footprint compared to carbon canister vessels under the same design conditions.

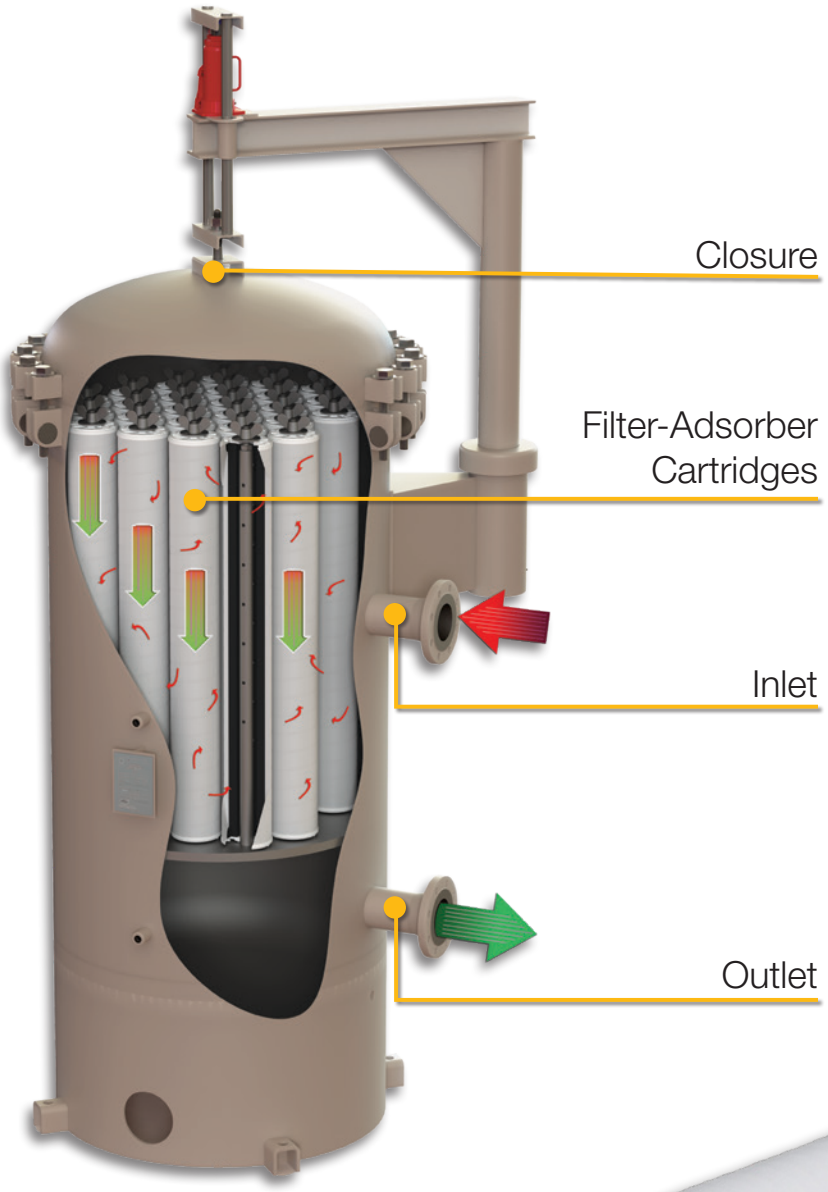
Series 14 technology lowers overall capital investment, revolutionizes process purification and increases overall plant efficiency.

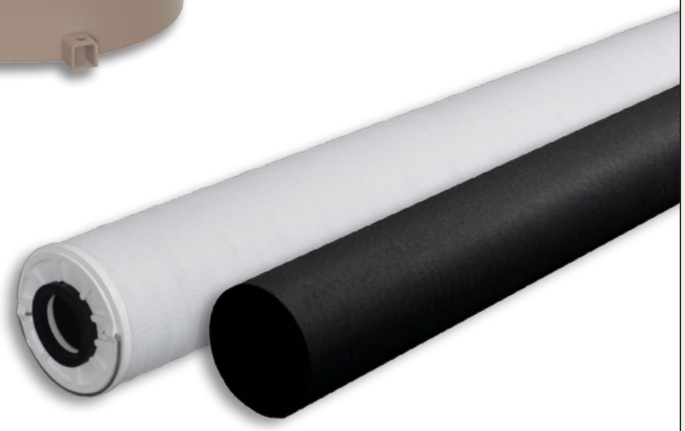
REVOLUTIONIZING PROCESS PURIFICATION

- PROVIDING CLEANER FLUID
- REDUCING COST
- IMPROVING SAFETY & ERGONOMICS
- PROTECTING THE ENVIRONMENT
- DECREASING MAINTENANCE TIME

TYPICAL APPLICATIONS

- Removal of hydrocarbons from glycol and amine process liquids used to dehydrate and sweeten natural gas
- Removal of hydrocarbon color from Natural Gas Liquids (NGL's) and condensate
- Removal of hydrocarbons from produced water streams
- Removal of hydrocarbons from wastewater streams
- Removal of hydrocarbons from rainwater runoff
- Removal of BTEX from glycol resulting in reduction of BTEX emissions





VESSEL SPECIFICATIONS

STANDARD

- 8” to 72” diameter
- ASME Code Section VIII, Div.1
- Design temperature from -20°F to 250°F
- Quick Opening Closure
- Pressure Parts: Carbon Steel
- External Attachments: Carbon Steel
- Hydrostatic testing at 1.3 or 1.5 x design pressure

OPTIONS

- Other Design Codes
- Design Pressure up to 10,000 psig
- Materials of Construction
  - Carbon Steel
  - 304 Stainless Steel
  - 304L Stainless Steel
  - 316 Stainless Steel
  - 316L Stainless Steel
  - Low Temperature Materials
- Non-Destructive Testing (NDT)
  - Radiography
  - Magnetic Particle
  - Liquid Penetration
  - Ultrasonic
  - Brinell Hardness
  - Charpy Impact
- Coating options
  - Sandblast: commercial, near-white and white metal
  - Paint: 2 & 3 coat corrosion resistant
- Optional PECO SafeLock or Swingbolt Closure

SERIES 14 OPERATION

Incoming fluid enters the inlet nozzle and impinges upon a baffle. Fluid then disperses throughout the vessel and passes outside-to-inside through the XtreamSorb cartridge. Fluid passes through the inner diameter of the riser assembly into the lower chamber of the vessel and exits the vessel through the outlet nozzle.

PROVIDING A CLEANER PROCESS FLUID STREAM

Activated carbon is widely used to remove hydrocarbon contaminants from process streams. Carbon utilizes its vast pore structure to promote contact between the surface of the carbon and hydrocarbon-based contaminants. Once a hydrocarbon contaminant comes in contact with the surface of carbon, it will adhere to the surface of the carbon through adsorption. Adsorption takes place when strong inter-molecular forces between the contaminant and carbon strip the contaminant away from process fluid passing over and through the carbon block.

Traditional process stream carbon adsorption utilizes relatively large loose carbon granules. The carbon granules are held by empty process vessels called fixed bed units, or held within replaceable filter canisters. Carbon block technology utilizes much smaller carbon powder that is either cast or extruded with a binding agent or adhesive. The utilization of drastically smaller carbon powder held tightly together with a binder forms a porous carbon block designed to drive a greatly enhanced mass transfer contact between the carbon and hydrocarbon contaminant species by eliminating void spaces and flow channeling due to carbon movement. The improved mass transfer results in cleaner fluids in a smaller less expensive filter vessel.

Parker engineers have formulated a carbon block with a pore structure specifically designed for hydrocarbon removal from process fluids.

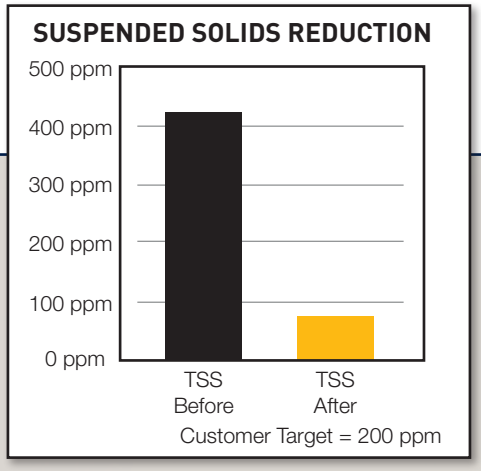
XtreamSorb cartridge technology is the marriage of PEACH, which provides particle filtration and small hydrocarbon droplet coalescing, with a carbon block for hydrocarbon adsorption truly designed for process streams. The two-stage design creates a revolutionary product that reduces footprint with unprecedented removal performance for a cleaner process fluids stream.

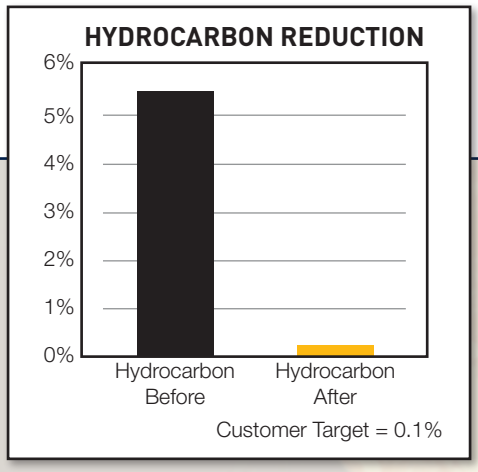
RETURN ON YOUR INVESTMENT

XtreamSorb in action in a glycol system with eye-catching results!

A client was having gas specification problems and spending as much as $10,000 per year to reclaim dirty glycol, only to see the quality of glycol and sales gas diminish shortly thereafter.

After installing XtreamSorb, hydrocarbon content and suspended solids dramatically decreased, making sales gas quality no longer an issue. Annual cost to use XtreamSorb is approximately one-third of the cost of reclamation and results in no downtime. Sales gas quality is now consistently on spec. Other benefits include a reduction in maintenance costs and anti-foam consumption.





Based on field data

XtreamSorb helps optimize system performance and consistently increases revenue in multiple ways.

Eliminate Reclamation Services
- Save dollars paid to reclamation services
- Increase production by eliminating downtime required for reclamation
- Reduce tower cleaning

Curb Fluid Carry-Over
- Use less makeup fluid
- Reduce environmental impact
- Decrease carry-over related shut-ins

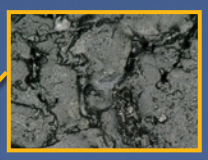
Increase Contactor Capacity by Decreasing Foam
- Increase throughput
  - ***Sell More Gas***
- Reduce energy consumption
- Improve mass transfer efficiency
- Reduce heat exchanger fouling

1st Stage PEACH® Filter

PEACH is a patented manufacturing process creating the most unique depth style filter cartridge on the market. The filter structure provides a gradient density pattern through radial, axial and helical directions. The advanced solids removal characteristics of the 1st stage PEACH protect the downstream carbon block from solids plugging. The oleophilic nature of the PEACH also attracts larger hydrocarbon droplets and semi-solids substantially increasing the hydrocarbon loading capacity of the two-stage cartridge, resulting in longer service life.

SPENT 1ST STAGE PEACH GRADIENT FILTER LAYERS

SPENT 2ND STAGE ACTIVATED CARBON BLOCK



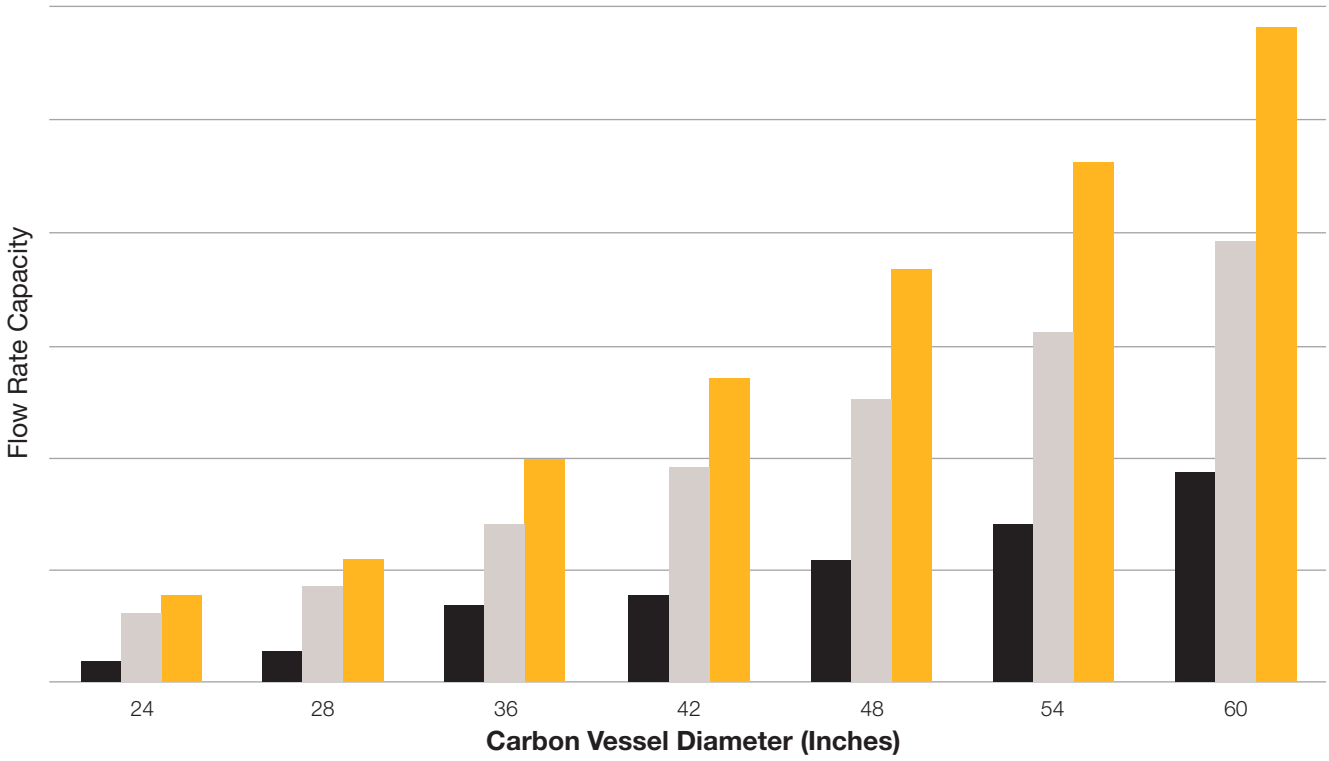
2nd Stage Carbon Block Adsorber

Parker's proprietary carbon block technology is specifically designed for removal of longer chain heavy hydrocarbons. The block is made using activated carbon powder held together by a binder. The tightly bound carbon structure prevents carbon movement and fluid channeling prevalent in traditional granular carbon canisters. The structured block improves mass transfer yielding higher efficiencies.

REDUCING YOUR CAPEX COST

Decreasing cartridge dimensions while effectively increasing flow rate per cartridge results in a smaller more economically sized vessel that is better suited to reduce footprint. Carbon powder bound in an extruded block allows for a larger adsorption area compared to granular carbon. Additionally, XtreamSorb's structure forces process fluid through the block ensuring 100% contact and adsorption in one pass. The end result is decreased capital and operational expenditures with increased efficiencies.

CARBON TECHNOLOGY FLOW CAPACITY VS. VESSEL DIAMETER

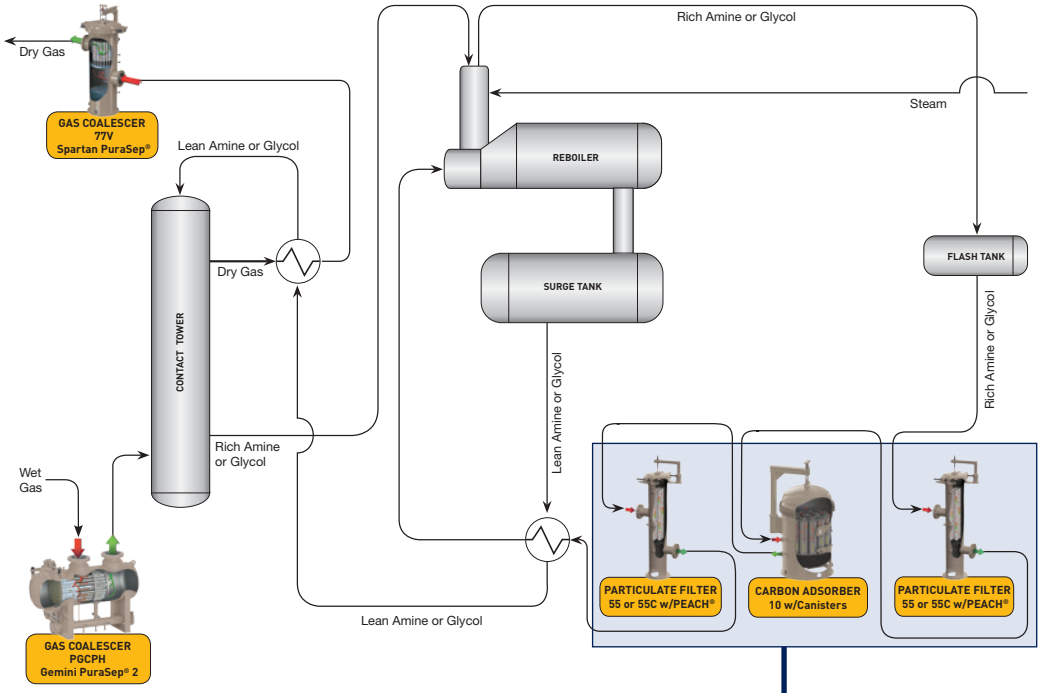


Carbon Vessel w/1122 Sized Granular Carbon Canisters Double Stacked

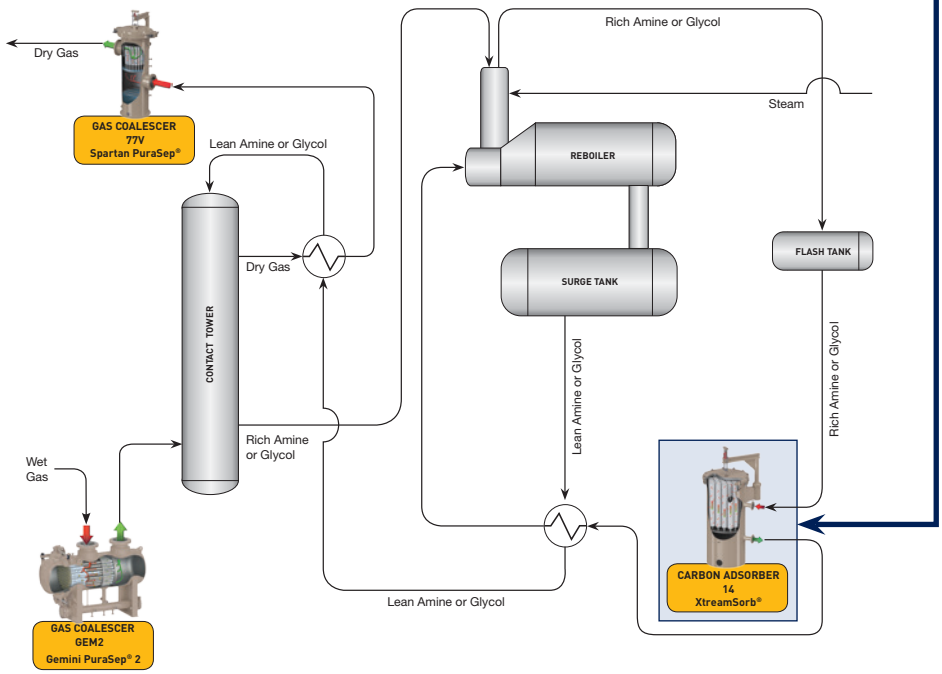
Carbon Fixed Bed Vessel w/Loose Granular Carbon

XtreamSorb Series 14 Carbon Vessel w/XS 544 XtreamSorb Carbon Block Cartridges

OPTIMIZE AMINE AND GLYCOL RECIRCULATION FILTRATION DESIGN WITH FEWER VESSELS



SERIES 14 – DOING THE WORK OF THREE VESSELS



Traditional TEG/Amine regeneration skids used in the natural gas industry utilize a pre carbon particulate vessel, carbon canister vessel and a post carbon particulate vessel. While effective, this traditional setup typically requires multiple passes to completely regenerate the fluid used in purifying the process.

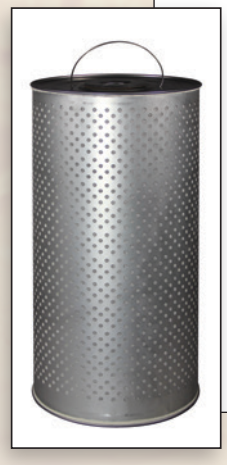
With Parker's patented Series 14 XtreamSorb design, process purification is being revolutionized by eliminating the need of the pre and post carbon particulate vessels. The first stage filter section does the job of a pre carbon particulate vessel. The carbon block technology purifies the process in a single pass and does not release carbon fines into the downstream process. Thus, removing the need for a post carbon particulate vessel. XtreamSorb, coupled with having a higher flow capacity and a smaller footprint than traditional carbon canisters, is sure to

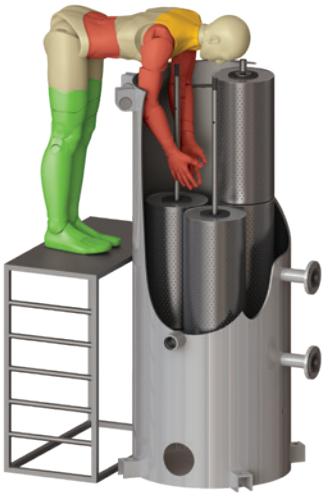
DECREASE OVERALL CAPEX COSTS AND FOOTPRINT COMPARED TO TRADITIONAL SYSTEMS.

SIGNIFICANT FREIGHT SAVINGS

The most economical way to ship carbon is by full pallets. Due to the size and weight of traditional carbon canisters, the typical pallet holds only 26 canisters. XtreamSorb's smaller footprint allows up to 50 cartridges per pallet. This allows customers to effectively ship the same number of XtreamSorb cartridges on one pallet, compared to needing two pallets to ship the same number of carbon canisters. Also, as traditional carbon vessels commonly stack two 22" carbon canisters, the XtreamSorb cartridge's single 44" length reduces the number of pallets even more. A change out of XtreamSorb cartridges can effectively reduce the number of shipped pallets from 4 to 1.

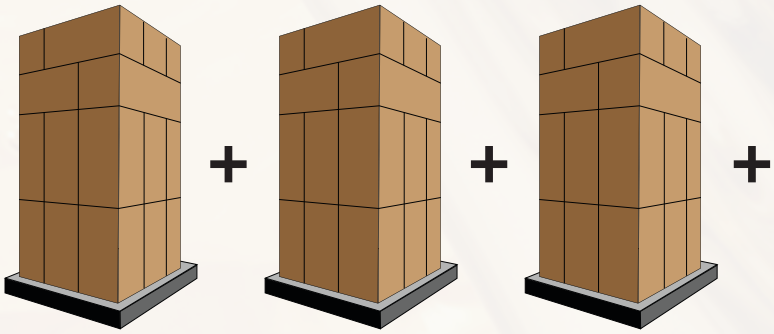
GRANULAR CARBON CANISTER





- Confined space entry
- Requires draining before removal
- 60 lbs per 22" canister

EQUIVALENT CANISTER TO CARTRIDGE

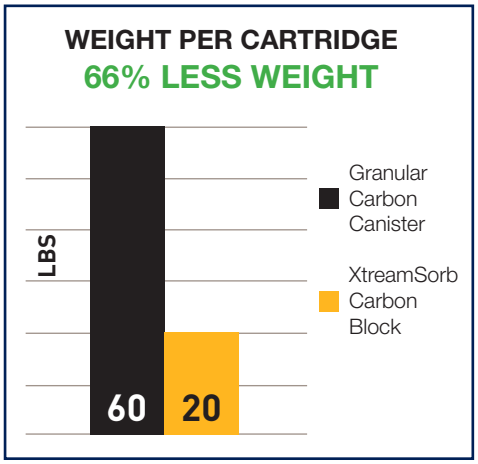


26 Granular Carbon Canisters per Pallet

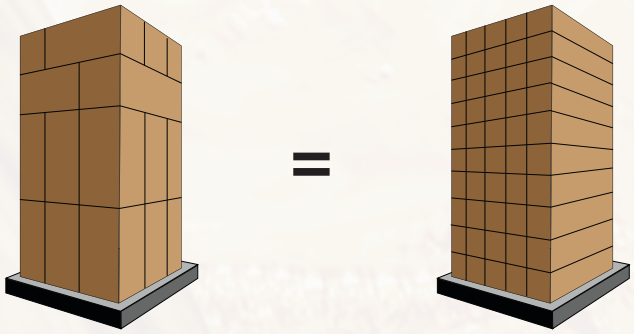
$$$$$

IMPROVING SAFETY & ERGONOMICS WITH A LIGHTER, SMALLER FOOTPRINT

Changing from traditional granular carbon canisters to XtreamSorb removes the pain of having to change-out double stacked canisters that **weigh up to 60 lbs each when saturated.** Whether operators use an overhead crane or manually remove the carbon canisters, the operation requires multiple repetitions where operators physically reach down into the vessel to hook or grab the canister bail handle. The XtreamSorb cartridge's continuous 44" length **only weighs up to 20 lbs when saturated.** Change-outs are safer and physical entry is greatly reduced. Operators can simply grab the top of the cartridge at the face of the closure and slide them out almost effortlessly.



CHANGE-OUT COMPARISON



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50 XtreamSorb Carbon Block Cartridges per Pallet

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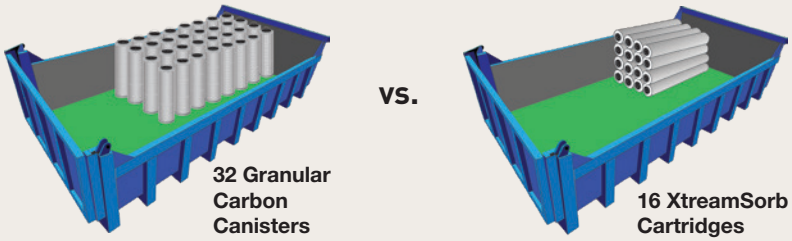
XTREAMSORB CARTRIDGE

- No confined space entry
- No draining required
- 20 lbs per 44" cartridge

PROTECTING THE ENVIRONMENT

- Lowers BTEX content by more than 99%
- Reduces process fluid loss
- Decreases number of cartridges needing disposal
- Decreases disposal space
- No metal support components related to cartridge
- Reduces disposal of process liquids
- Reduces plant clean-outs

80% DISPOSAL SPACE REDUCTION



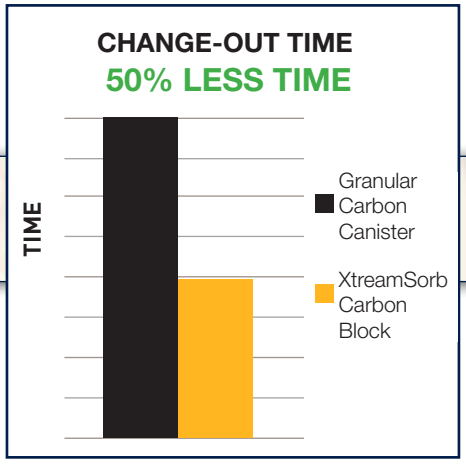
– Two carbon canisters is equal to one XtreamSorb cartridge

– One XtreamSorb only takes up 863.5 cubic inches of volume compared to two canisters taking up 4,179 cubic inches of volume.

CUT MAINTENANCE TIME IN HALF

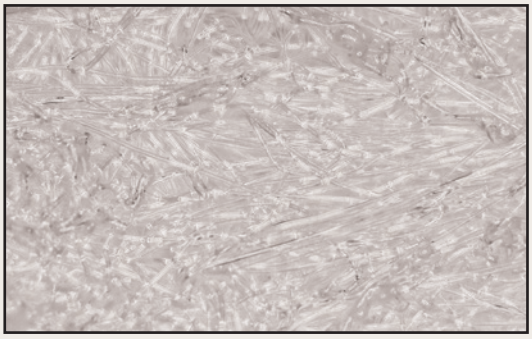
When changing canisters in a carbon vessel, operators have to typically isolate, vent and drain fluid out of the vessel before opening. Next, canisters are lifted out of the housing one at a time with an overhead crane, or manually. Since canisters are normally filled with fluid, operators must pause holding the canister over the housing allowing it to drain before removal. Converting from double stacked canisters to one continuous XtreamSorb cartridge removes the need to drain canisters and use an overhead crane, all while reducing repetition. Additionally, XtreamSorb cartridges decrease chances of fluid loss and cut change-out time at least in half.

Double Stacked Granular Carbon Canisters



Single Piece XtreamSorb Carbon Block

XTREAMSORB CARTRIDGE INFORMATION



Clean Filtration Media

Spent Filtration Media

Photos on the left show clean 1st stage PEACH filter and 2nd stage carbon block.

Photos on the right show spent 1st stage PEACH filter capturing solids and hydrocarbon droplets along with the carbon block fully adsorbed.

XTREAMSORB CARTRIDGE ORDERING INFORMATION

XS	G	—	544	—	V	—	CR 2.20	HC
SERIES	**MEDIA/END CAPS**		**SIZE**		**SEAL**		Cartridge fits both 1 and 1.5" riser post	Blank = Typical Process Applications HC = Condensate De-colorization
	Blank = Polypropylene G = Polyester		520 522 540 544		B = Buna-N E = EPDM V = Viton			

OPERATING DATA

FLOW DIRECTION: Outside-to-Inside

MAX TEMP: Polypropylene: 180ºF / 82ºC
Polyester: 220ºF / 104ºC

MAX. DIFFERENTIAL PRESSURE: 20 psid / 1.3 bar

RECOMMENDED CHANGE-OUT DIFFERENTIAL PRESSURE: 10 psid / 0.68 bar

pH RANGE: Polypropylene: 3–13
Polyester: 3–10

PERFORMANCE

SOLIDS EFFICIENCY: 99% of 10 micron
92% of 5 micron

* up to 2 lbs of solids loading

HYDROCARBON/BTEX CONTENT REMOVAL : 99+% in one pass

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BR-OG-XTREAMSORB-14-200610

SKIDDED SYSTEMS AVAILABLE

SERIES 55C CHEMELEAN® PRE-FILTER WITH SERIES 14 XTREAMSORB® VESSEL SHOWN

VESSEL ORDERING INFORMATION

14	–	10	–	XS544	–	24	–	XXX
Series		**No. Cartridges**		**Cartridge Size** XS544		**Nominal Shell Diameter** (Inches)		**Design Pressure** (PSIG)

Refer to data sheet DS-OG-XTREAMSORB-XS for detailed cartridge information.

The following information is required when requesting a quote for XtreamSorb

- Operating pressure range
- Operating temperature range
- Type of liquid
- Liquid density or specific gravity
- Contaminants
- Design pressure
- Design temperature
- Corrosion allowance requirements
- Special design requirements

Consult factory for availability and pricing