

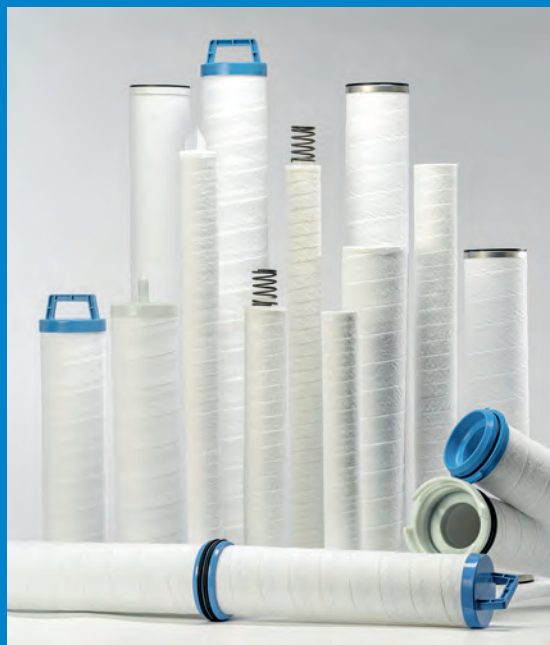
JONELL SYSTEMS™

TRI-SHIELD™

Tri-Lobal Spiral High Efficiency Long-Life Depth Filtration Platform

PATENT PENDING

Making the world safer, healthier
and more productive.



JONELL SYSTEMS™

Filtration Group®

ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ

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Jonell Systems™

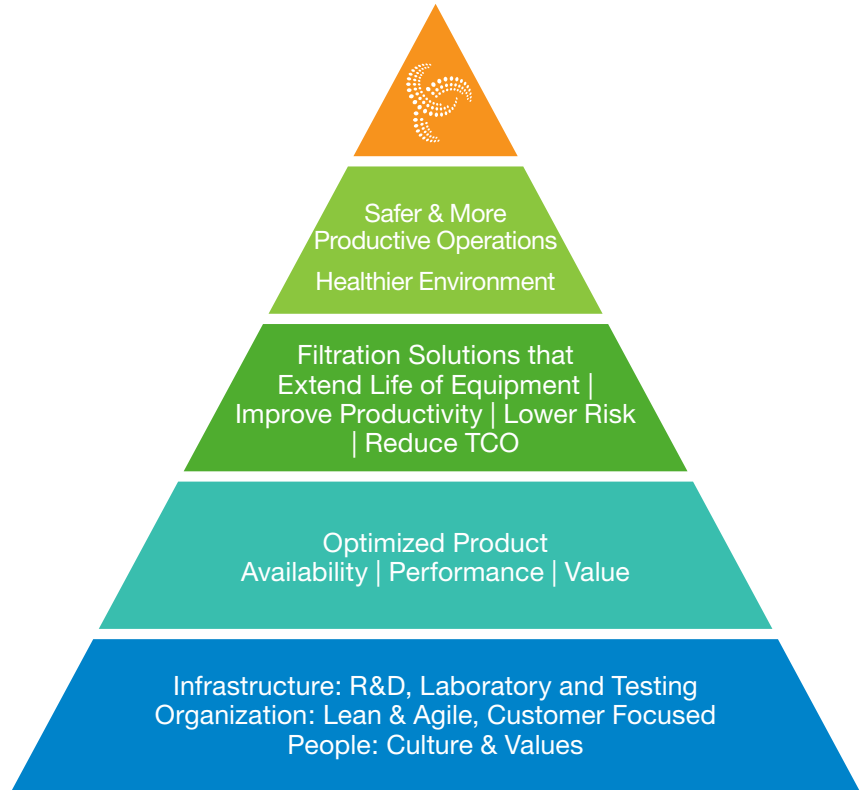
Jonell Systems, a Filtration Group brand, partners with oil, gas, refining, chemical and power companies worldwide to address end to end filtration challenges to improve process safety, reliability, productivity and ultimately business profitability. We manufacture complete systems, vessels and a wide range of cartridges to optimize your filtration processes. This, coupled with our technical expertise, allows us to solve even the most challenging filtration applications.

Jonell Systems has a long history of developing innovative cartridges for the oil & gas industry, including the two piece Twist-LOK™ cartridge for gas coalescing, which allows customers to be able to change only half of the cartridge as needed, reducing the total cost of ownership.

Jonell Systems also introduced SentinelTL™, a horizontal gas coalescer with 10X greater solid capacity, and 35X greater liquid capacity to deliver up to 40% cost savings for customers.

We are excited to bring our latest innovation, the TRI-SHIELD™ media technology, to the market.

JONELL SYSTEMS ADVANTAGE



We understand our customers rely on our knowledge, expertise and experience for innovative filtration solutions. Customers depend on us – we deliver.

Our brands include:



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TRI-SHIELD™ Filtration



The patent pending TRI-SHIELD™ media has been developed to create superior depth filtration technology that can be used in a wide variety of gas and liquid applications. This technology is designed to create filtration cartridges with multiple unique spiral layers of advanced treated media. TRI-SHIELD's highly engineered blend of fibers is thermally bonded to provide optimal efficiency, dirt loading, and a reduced cost of ownership.

TRI-SHIELD offers multiple advantages over other available depth filtration alternatives. Our engineered blend of Tri-Lobal and synthetic fibers provides a larger effective surface area per media volume and less flow resistance than traditional fibers resulting in extremely high removal efficiencies.

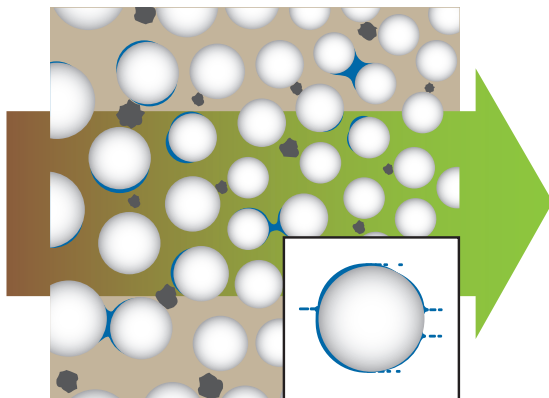
TRI-SHIELD media can be manufactured in both polyester and polypropylene to make this among the most chemically compatible media materials in the oil & gas industry. Our engineered media with Tri-Lobal fibers gives the filter cartridges an open porosity while maintaining a rigid structure.

Design advantages include:

- Standard offerings built to suit a wide range of applications
- Varying density for high efficiency and superior dirt loading
- Media layers can be engineered for challenging applications
- Filtration flexibility with multiple surface treatment options
- Binder free construction for high chemical compatibility
- Silicone free to prevent contamination in chemical applications like paints, inks, coatings

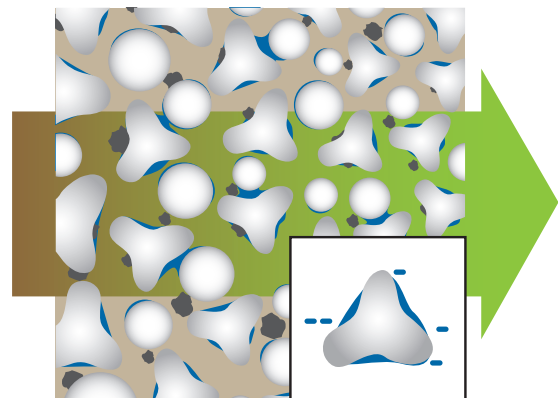
TRI-SHIELD media cartridge with Tri-Lobal fibers provides up to 25% less pressure drop at start-up compared to standard polyester depth media. **This provides longer life, higher dirt loading, and reduced filter change-outs.**

GREATER CONTAMINANT LOADING · OPTIMAL PRODUCT FLOW · INCREASED FILTER LIFECYCLE



Traditional Tube Cross Section:

Typical void spaces to capture liquid and solid particulates. Conventional pathways for standard gas flow.



Jonell Systems' Tri-Lobal Tube Cross Section:

Increased void spaces to capture liquid and solid particulates. Increased pathways for optimal gas flow throughout.

Benefits



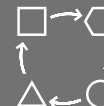
HIGH CONTAMINANT LOADING

- The unique engineered blend of multiple fibers sizes and shapes, is specifically layered in an advanced spiral construction. This process gives TRI-SHIELD superior dirt loading compared to traditional depth filtration medias.
- Tri-Lobal fiber blend which is thermally bonded during winding process allows for greater void space compared to traditional fiber blends for improved contaminant loading capacity.
- Structural rigidity of the TRI-SHIELD cartridges makes them resistant to abrasion by solid contaminants often encountered in the field. This also allows for less media compression from differential pressure.



HIGH EFFICIENCY

- Varying fiber styles, sizes and layering of TRI-SHIELD media in a gradient depth form allows for higher efficiency when compared to traditional depth medias.
- This unique engineered media allows for targeted contaminant collection zones where particles lose velocity and collect, effectively maximizing total media and void utilization.



HIGH ADAPTABILITY

- Each layer performs a specific contaminant management function which gives us the ability to engineer different layers of media even for the most challenging applications.
- 100% synthetic coreless cartridges provide great chemical compatibility across a wide range of applications.

High efficiency, high dirt loading and structural integrity lead to longer life and fewer change-outs. The result is lower planned and unplanned process downtime and lower TCO.



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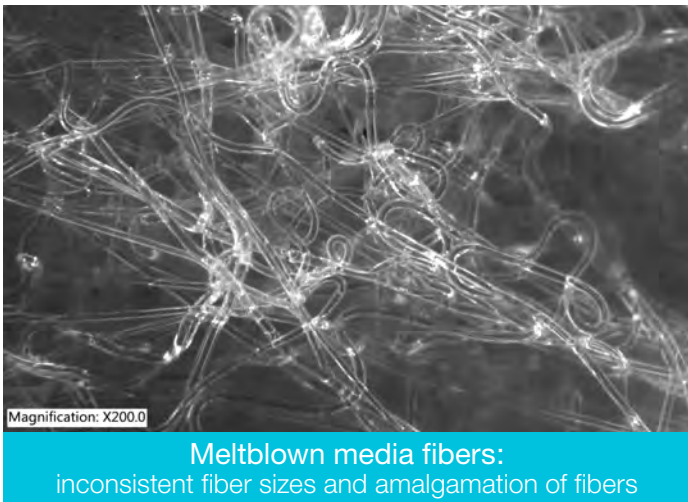
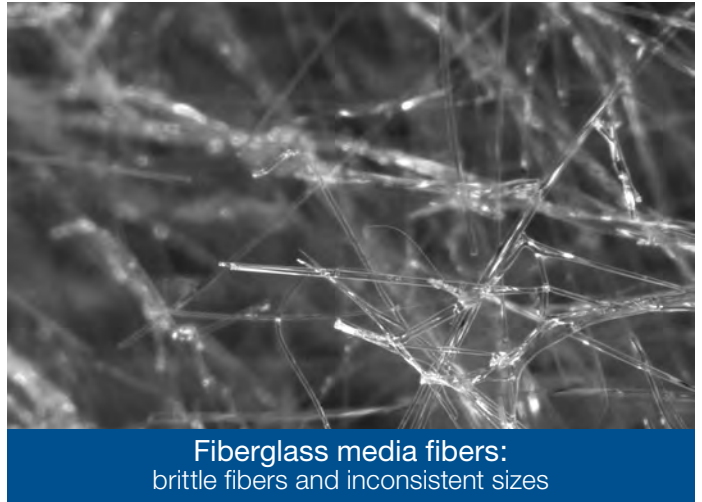
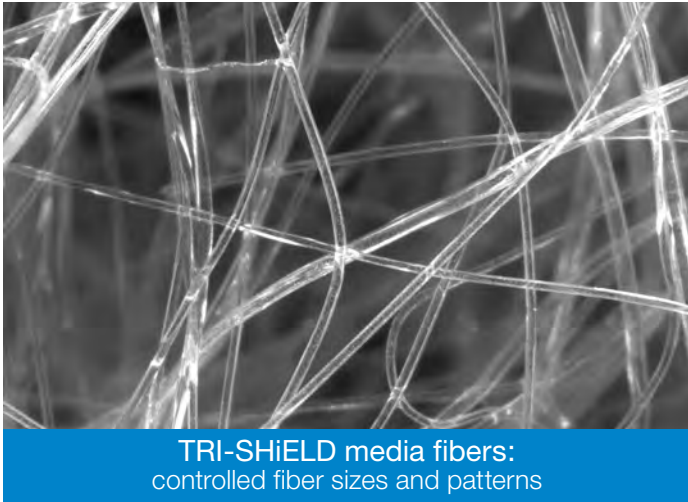
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Filtration Technology Evaluation

TRI-SHIELD CARTRIDGES HAVE PERFORMANCE ADVANTAGES OVER TRADITIONAL DEPTH AND FIBERGLASS CARTRIDGES IN GAS APPLICATIONS AND HAVE SUPERIOR FILTRATION CAPABILITY WHEN COMPARED TO RESIN BONDED, MELT BLOWN, STRING WOUND AND SOCK FILTERS IN LIQUID APPLICATIONS.



	TRI-SHIELD	Traditional depth fiberglass	Pleated fiberglass cartridges	Traditional depth polyester	Traditional melt blown
Sieving	4	4	5	4	4
Impaction	5	4	3	4	2
Diffusion	5	5	3	4	2
Flow vs DP	3	3	4	2	2
Liquid Draining	5	4	4	4	3
TOTALS	22	20	19	18	13

Based on a scale of 1 to 5 where 1 is very poor, 2 is poor, 3 is average, 4 is good and 5 is very good.

TRI-SHIELD Gas Filtration Range

Jonell Systems uses the patent pending TRI-SHIELD media platform to develop a wide range of dry gas, filter separator and gas coalescing cartridges for the oil & gas filtration applications.

SPECIFICATIONS	DRY GAS & FILTER SEPARATOR	VERTICAL REVERSE FLOW COALESCER	HORIZONTAL COALESCER
Nominal Sizes	3.0", 4.50", 5.50"	3.50", 4.50", 5.50"	4.50"
Nominal Lengths	12", 24", 28", 36", 43", 48", 72", 79"	12", 24", 36", 48", 72"	73", 82", 94"
Media type	Depth Style Polyester Depth Style Polypropylene		
Core	Coreless Tin Plated Stainless	Tin Plated Stainless	Coreless Tin Plated Stainless
Gasket	Same as Media type Buna Viton TES O-ring		
Standard Efficiency	Up to 99.9% of 0.3 μ & larger	Up to 99.99% 0.3 μ & larger of both liquid & solids	Up to 99.99% 0.3 μ & larger of both liquid & solids
Temperature	240-degree F for Polyester (above 200-degree F requires a core) 180-degree F for Polypropylene		
Common Applications	<ul style="list-style-type: none"> • Compressor Suction/Discharge • Custody Transfer Meters • Gas gathering • Glycol Dehydration • Amine Treating • Molecular Sieve Dehydration • Residue Gas • Fuel Gas Conditioning • Syn Gas Cleanup • Mercury Bed Protection • Cryogenic Plant Inlet • Landfill Gas • Catalyst protection • Lo-Nox Burner protection • Propane Re-gasification • Metering Stations • Catalyst protection • PSA systems (pressure swing adsorption) • Utility & Instrument Air 		

Other configurations and gasket options available. Contact Jonell Systems to discuss your unique needs.



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TRI-SHIELD Liquid Filtration Range

Jonell Systems uses the patent pending TRI-SHIELD platform to develop a wide range of liquid filtration cartridges used in oil & gas, chemical, general industrial and food & beverage applications.

SPECIFICATIONS	LIQUID PARTICULATE CARTRIDGE	
Diameter	2.50", 2.750", 3.00", 6.00"	
Nominal Lengths	9.75", 10", 19.5", 20", 29.25", 30", 36", 40", 47", 60"	
Media type	Depth Style Polyester Depth Style Polypropylene	
Gasket	No Gasket (Double open-ended elements do not use end caps or gaskets) Buna-N EPR Viton Silicone TES	
Standard Micron Rating	1μ to 150μ	
Efficiency	90%, 99.9%	
End Cap Style	<ul style="list-style-type: none"> • Double Open Ended • Spring/Extension • Finned/222 O-ring • Finned/Extension • 222 O-ring/Closed 	<ul style="list-style-type: none"> • 222 O-ring/Spring • Spring • Extension • 226 O-ring/Closed • Finned/226 O-ring
End Caps & Cores	Polyester Polypropylene Carbon Steel Stainless Steel	
Temperature	240-degree F for Polyester 180-degree F for Polypropylene	
Common Applications	<ul style="list-style-type: none"> • Amine • Condensate • Glycol • NGL/Hydrocarbon Liquids • Acids & Alkali, Solvents • Catalyst Recovery • Produced water disposal • Lubricants 	<ul style="list-style-type: none"> • Cooling Water • RO Pretreatment • Inks, Adhesives, Fabric Coatings, Paints, Dyes • Product Polishing • Bulk Chemical Filtration • Pulp & Paper • Waste Water • Process Water

Other configurations and gasket options available. Contact Jonell Systems to discuss your unique needs.



For more details on this new age TRI-SHIELD depth filtration technology, contact us: