

JONELL SYSTEMS™

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# GAS COALESCING FILTERS

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Making the world safer, healthier and more productive.

## UNDERSTANDING THE ROLE OF COALESCERS

Since the early 1980's, Gas-Liquid Coalescers have played an integral role in the Oil & Gas industry. Sometimes referred to as Reverse Flow Coalescers, this vessel is designed to remove moderate amounts of liquid aerosols from natural gas streams. They are also relied on to protect sensitive equipment.

### BENEFITS OF GAS/LIQUID COALESCERS:



#### PRODUCTIVITY

Increases equipment uptime



#### SAVINGS

Reduces maintenance cost



#### ECO-FRIENDLY

Decreases energy consumption



#### EQUIPMENT LIFESPAN

Extends equipment changeouts

### Gas Liquid Coalescers Protect Essential Equipment Including:

**Amine Plants & Glycol Absorbers** from contamination causing foaming and a loss of fluids leading to higher costs of chemical additives.

**Compressors** from dirty fuel gas resulting in premature wear of internal components.

**Gas Turbines** from small particulate and droplets that contaminate internal parts causing wear and ultimately, costly repairs.

**Heat Exchangers** from contamination of tubes that gradually reduces exchanger efficiency.

**Low NOx Burners and Gas Fired Heaters** from fouling the burner tips that result in increased emissions and decreased efficiencies.

**Metering Stations** and sensitive ultrasonic equipment from excessive contamination to avoid false readings.

**Molecular Sieves** from lube oils causing problems during regeneration cycles necessitating replacement of mol sieve bed.

**Propane Refrigeration Systems** from lube oil contamination from compressors which must be removed from propane streams to meet specifications.

### Consider this:

Coalescer's typically filter contaminants that are much finer than those removed by other filtration equipment. These contaminants may contain:

- Low surface tension aerosols such as synthetic lube oils & hydrocarbons.
- Shear sensitive corrosion by-products such as iron sulfide & iron oxide.
- Pipeline & plant chemicals that are difficult to remove.

We offer a complete line of coalescing filters that can be fully customized to suit your specific needs including the patent pending TRI-SHIELD media.

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## UNDERSTANDING GAS LIQUID COALESCING

### How it Works

Liquid aerosol in the gas stream is formed via three mechanisms:

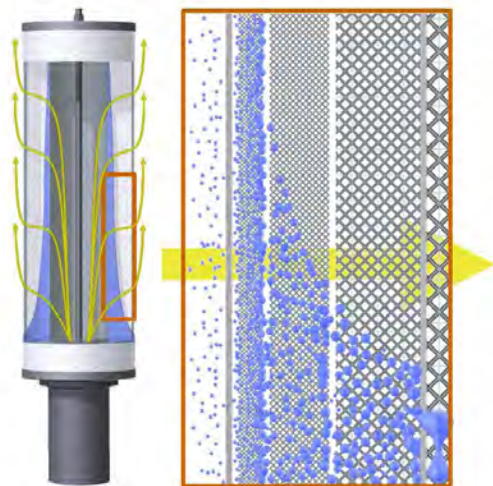
1. Entrainment - the movement of free liquid into a gas stream
2. Condensation - vapor turns into liquid
3. Atomization - the shearing of droplets

In order to separate small droplets, they are coalesced into much larger droplets and liquid streams. To coalesce means to 'grow', and a gas coalescer facilitates droplet to droplet interaction and agglomeration by means of trapping entrained liquids within the matrix of the cartridge media.

Three Primary Mechanisms of Coalescing:

1. Direct Interception
2. Inertial Impaction
3. Brownian Motion and Diffusion

In each case, the aim is to maximize the probability that a droplet will collide with media fibers. A crucial factor of coalescing is the consistency of filter media including pore size, fiber diameter and its uniform distribution. Jonell Systems engineered media and strict quality control ensures maximum performance for your application.



### Two Styles of Coalescing Media:

1. Pleated - multiple pleats to maximize surface area
2. Depth - An engineered gradient matrix of specified thickness to maximize contaminant interaction and coalescing of shear sensitive aerosols.

You can rely on Jonell Systems to recommend the most suitable style of element for your application.



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### Jonell Systems Series JVCS Standard Fuel Gas Coalescing Filters

Our JVCS line of gas coalescers offer a standard, low cost, high efficiency alternative for all your fuel gas filtration needs including applications with low liquid loading and gas volumes. The vessels are designed to ASME code and utilize Jonell Systems high-efficiency coalescing elements in a variety of lengths for maximum flexibility. The elbow-inlet design allows for a single stage of controls.

Consult our factory for design conditions and dimensional layout.

## Coalescer Design

A correctly designed Gas Coalescer consists of two stages: the Knockout Stage and the Element Stage. Each stage is sized for maximum liquid removal and necessitates a set of liquid controls.

### Knockout Stage

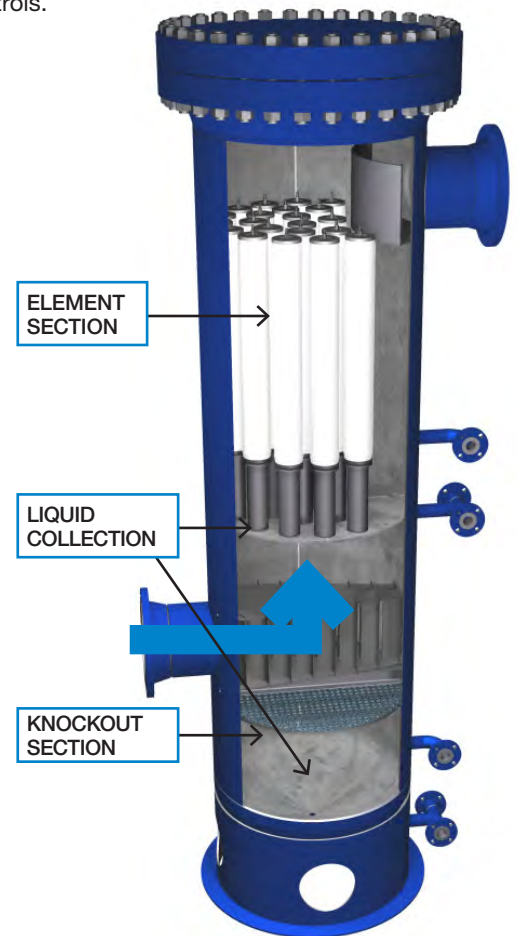
As natural gas enters a properly designed Coalescer and turns upward, its velocity is reduced, allowing larger droplets to fall out due to gravity. This compartment also stores the liquids below the high velocity zone protecting the cartridges from flooding. In applications with higher liquid loads, specialized inlet technologies or bulk separator technologies can be employed in order to reduce the liquid load to the elements.

### Element Stage

The element stage of the Coalescer is fitted with Jonell Systems TRI-SHIELD (JRG Series) gradient depth polyester media or the Micro-LOK (JPMG) series pleated cartridges made from micro-fiber glass coalescing media. The direction of flow is inside to out, resulting in a reduction in gas velocity through the media. This reduction increases the droplet residence time and reduces the drag forces, increasing the probability of collision with other droplets and allowing sufficient time for drainage. The annular velocity of gas after exiting the media is also crucial to prevent liquid lift-off from the elements.

Jonell Systems coalescing elements are built with a drain layer which enhances liquid removal while providing a calm interface between liquid and gas. Element spacing and riser design are also critical to ensuring droplet separation after initial capture.

In order to prevent channeling through the media, a minimum distance between the top of the elements and the outlet nozzle must be calculated. Positive element seal, riser support, outlet baffle and liquid holding capacity are other essential aspects of Gas Coalescer design.



## Typical Model Number

<b>G</b>	<b>R</b>	<b>A</b>	<b>C</b>	<b>1</b>	<b>C</b>	<b>27</b>	<b>F</b>	<b>2</b>	<b>C</b>	<b>A</b>	<b>N</b>	
<b>Jonell Systems Series</b>	<b>Closure Style</b>	<b>Qty of Elements</b>	<b>Pressure Rating</b>	<b>Inlet/Outlet Size (inch)</b>	<b>Internal Cart. Size</b>	<b>Options</b>	<b>Process Configuration</b>	<b>Housing Material</b>	<b>ASME Code</b>	<b>Inlet/Outlet Style</b>	<b>Internal Material</b>	<b>O-Ring Material</b>
Gas Housings	A Flat swing bolt B Domed swing bolt D RFWN flange top F RFSO flange top S Screw top Y Yoke or internal door	Number of Elements	27 275 psi 74 740 psi 144 1440 psi	2 12 3 14 4 16 6 18 8 20 10 24	3½" OD x length A 12" D 36" C 24" 4½" OD x length F 12" J 36" H 24" 5½" OD x length P 36"	Assigned by Jonell Systems to indicate specials	R Vertical Reverse Flow T Vertical Small Volume Reverse flow	C Carbon Steel U 316SS Wetted A 304SS Wetted	C ASME U stamp N No U stamp	F RFSO L RFLWN N FNPT W RFWN	A 304 SS C Carbon Steel U 316 SS	N Buna-N V Viton E EPDM S Teflon encapsulated silicon T Teflon encapsulated Viton F Flat Gasket

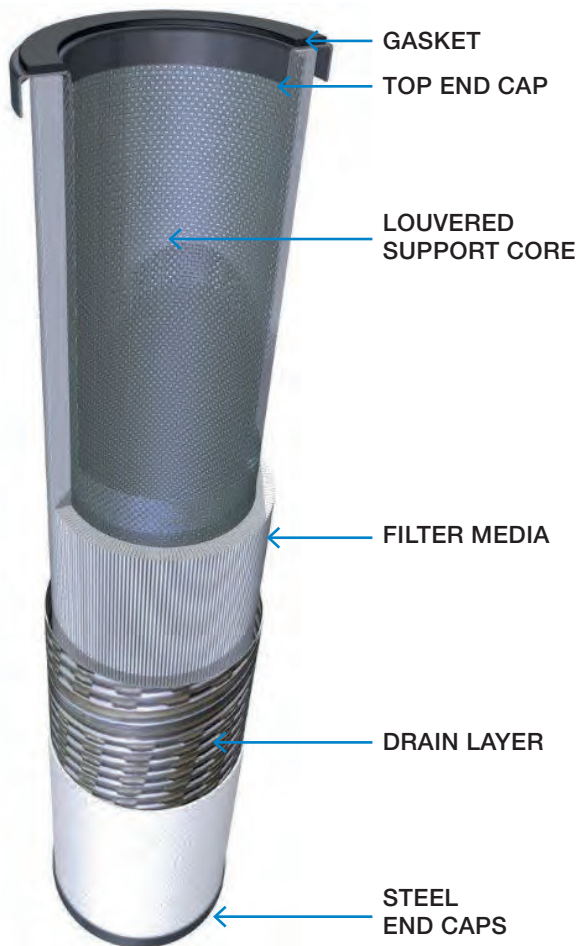
## Element Selection

Jonell Systems patent pending TRI-SHIELD JRGC series filters come standard with vertical coalescers. This high efficiency media delivers up to 15X fewer contaminants downstream of the filtration solution.

### Also Available:

JPMG Micro-fiberglass media designed to efficiently coalesce liquid droplets and remove solid particulate down to 0.3 microns. Plated steel and caps and cores are joined mechanically to ensure high integrity of the element. There is a polyester outer drain layer to facilitate uniform drainage of liquids.

Also available in Pleated microglass JPMG and depth fiberglass JMG for applications where a depth polyester is not the correct solution for the application.



Jonell Systems coalescing elements are available in various standard and custom sizes, pleated and depth configurations to fit virtually every application.

They are engineered and manufactured in standard fiberglass, micro-glass and polymeric media to ensure compatibility with most process.

### JRGC SERIES

<b>Material of Construction</b>	Depth Style Polyester Depth Style Polypropylene
<b>Maximum Temperature</b>	240°F (Polyester) 180°F (Polypropylene)
<b>Minimum Temperature</b>	-60°F
<b>Change Out Differential</b>	12-15 PSID
<b>Burst Pressure</b>	>75 PSID
<b>Available Micron Rating</b>	0.3 Microns
<b>Standard Sizes</b>	312, 324, 336, 348 512, 524, 536, 548

### JPMG SERIES

<b>Material of Construction</b>	Pleated Micro Fiberglass
<b>Maximum Temperature</b>	300°F
<b>Minimum Temperature</b>	-60°F
<b>Change Out Differential</b>	12-15 PSID
<b>Burst Pressure</b>	>75 PSID
<b>Available Micron Rating</b>	0.3 Microns
<b>Standard Sizes</b>	312, 318, 324, 336, 536

### JMG SERIES

<b>Material of Construction</b>	Micro Fiberglass
<b>Maximum Temperature</b>	275°F
<b>Minimum Temperature</b>	-60°F
<b>Change Out Differential</b>	12-15 PSID
<b>Burst Pressure</b>	>75 PSID
<b>Available Micron Rating</b>	0.3 Microns
<b>Standard Sizes</b>	312, 318, 324, 336, 536



## ABOUT US

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.

As a part of Filtration Group, the world's fastest growing filtration company, it is our mission to make the world safer, healthier and more productive.

Scan QR Code to find our locations



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