

JONELL SYSTEMS™

CARBON SERIES

Making the world safer, healthier
and more productive®

Jonell Systems activated carbon products are specifically designed to attend the toughest applications the oil and gas industry has to offer. By using only the highest quality materials and the most robust designs, Jonell Systems guarantees a finished product second to none.

HARDNESS

The hardness number is a standard test recognized by ASTM to determine the hardness of a given carbon. The leading lignite based carbon manufacturer does not use a specification per the ASTM standard test method and instead use a non-standard abrasion resistance test. Should an ASTM hardness number be tested on the leading lignite based activated carbon, a value of 60 should be expected.

Therefore, the Jonell Systems activated carbon hardness number of 90 is significantly harder translating to less particle attrition and carbon fine generation during transportation, replacement, and use. Always remember to use an accepted rinsing procedure reducing procedure for the best service possible from your Jonell Systems activated carbon product. In the right quantity, coal fines can contribute to foaming issues. Don't forget air can also be a potent contributor!

WHAT ELSE WILL I FIND IN MY ACTIVATED CARBON?

Some other manufacturers acid wash their carbon with hydrochloric acid and rinse it. As a result, an acidic residual remains on the carbon leaving a typical pH value of 4.5. Because Jonell Systems activated carbon is not acid washed, it will not decrease the pH of an Amine stream.

Total ash content measures the non-carbon portion of an activated carbon. As the ash content of the leading lignite based carbon is almost twice that of the Jonell Systems carbon, there is a much higher potential that compounds within this ash may dissolve within the fluid being treated.

In addition to the above non-carbon contaminants, Jonell Systems activated carbon contains 7% less water than the leading lignite based activated carbon. Less water translates to more carbon in every shipment.

PORE STRUCTURE

While most carbon is used in water treatment, the primary function of Jonell Systems carbon in oil and gas applications is to remove long chain hydrocarbons.

The molasses number is a good indicator for predicting how well an activated carbon will adsorb higher molecular weight organics. The leading lignite based carbon manufacturer uses a non-standard molasses test used by no other company, while the Jonell Systems molasses number is based on a more standard test. A molasses decoloring efficiency (DE) of 85 converts to a molasses number of approximately 400. As both the Jonell Systems and leading lignite carbon manufacturer have a molasses number of approximately 400, one would expect similar performance in adsorbing higher molecular weight organics.

The iodine number is an excellent parameter to determine the overall surface area of activated carbons, but it also is a great indicator of how well a carbon will adsorb organics.

OPERATING CONDITIONS

Factors affecting carbon performance include temperature and contact time in addition to the type of carbon and the targeted contaminant. The maximum recommended operating temperature for carbon is generally 120°F as exceeding 150°F can greatly reduce capacity in hydrocarbon capture levels.

Similarly, high rates of flow or reduced contact time diminish the ability of the carbon to capture and retain contaminants. Unnecessary abrasion can also be an additional side effect.

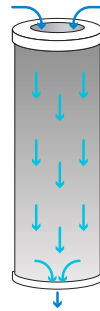
A carbon unit should always be protected upstream and down by adequate particulate filtration to prevent fouling of the bed and to prevent any carbon fines from entering the system. In a properly designed system, the carbon unit should not develop any significant differential pressure over time.

CARBON SERIES



JVF SERIES ACTIVATED CARBON CANISTERS

Jonell Systems Vertical Flow Activated Carbon Canisters increase fluid contact by eliminating the potential bypass in using the relatively thin bed available in a radial flow configuration. Jonell Systems JVF 1120 and 1122 canisters outlast the radial flow design by 30%.



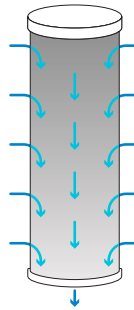
BULK ACTIVATED CARBON

Jonell Systems Activated Carbon is specially selected to maximize performance in gas processing applications where the target contaminant is long chain hydrocarbon molecules. Used in all Jonell Systems Carbon Canisters, it is also available in bulk form, in 44 lb bags, and 880 lb super sacks.



JRF SERIES ACTIVATED CARBON CANISTERS

Jonell Systems Radial Flow Activated Carbon Canisters present a greater superficial area to the process fluid, lowering velocity to better deal with high solids contamination.



| Test Parameter | Test Method | Specifications |
|-------------------------|------------------------------|-----------------------|
| CTC Activity, min | ASTM D-3467 | 55 |
| Iodine No., min | ASTM D-4607 | 900 mg/g |
| Surface Area, min | N ₂ B.E.T. Method | 975 m ² /g |
| Moisture As Packed, max | ASTM D-2867 | 3% |
| Dry Apparent Density | ASTM D-2854 | 0.38 - 0.40 g/ml |
| Hardness No., min | ASTM D-3802 | 92 |
| Total Ash, max | ASTM D-2866 | 15% |

| Parameter Size Distribution (ASTM D-2862) | |
|---|----|
| +4 (Oversize), Max | 5% |
| -12 (Undersize), Max | 5% |

NOMENCLATURE

| JRF | 7 | 20 | C | | SS |
|-----------------------|-----------|---------------|-------------|--------------------|----|
| Flow direction | OD | Height | ID | Other | |
| JRF Radial | 6 6" | 18 18.25" | Blank 2.06" | HT High Temp | |
| | 7 6.75" | 20 20.25" | N 1.5" | SS Stainless Steel | |
| | 11 10.75" | 22 22.25" | LH 2.5" | V Viton Gaskets | |
| | | | Blank 1.5" | | |
| | | | 2.25 2.25" | | |

| JVF | 7 | 20 | C | | SS |
|-----------------------|-----------|---------------|-------------|--------------------|----|
| Flow direction | OD | Height | ID | Other | |
| JVF Vertical | 6 6" | 18 18.25" | Blank 2.06" | HT High Temp | |
| | 7 6.75" | 20 20.25" | N 1.5" | SS Stainless Steel | |
| | 11 10.75" | 22 22.25" | LH 2.5" | V Viton Gaskets | |
| | | 36 36.00" | 2.25 2.25" | | |
| | | | Blank 4.0" | | |



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