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Atlas Carbon LLC

Growth Alliance

Advanced Carbon Products

Gillette, WY April 7, 2017

Who are we?



- **Atlas Carbon** produces premium-grade, low-cost activated carbon products for air and water treatment systems. Located in the heart of the Powder River Basin in Gillette Wyoming, we combine the novel approach of using high-quality PRB coals as our feedstock, in combination with our patented Pneumatic Flash Calciner (PFC) activation process to produce the *most* cost-effective activated carbon solutions available today.

Management



- Frank L. Levy – Chairman
- Jim Dye – President
- Michael A. Jones – Co-founder and Chief Technology Officer
- Brian F. LeBourgeois – Vice President & Chief Financial Officer
- Jim Ford – Chief Operating Officer & Vice President
- Keith McGee – VP Business Development

It all starts with PRB Coal



- You get out, what you put in... PRB coal is America's most responsibly mined, most abundant, and most consistent coal for producing the finest activated carbons. Atlas is well established in the very heart of PRB country, strongly focusing on quality feedstock, in response to decades of understanding carbons made from lignite – the lowest rank coal – and their inherently higher moisture and ash profiles. PRB coal is a cleaner, better option for producing activated carbon products.

Coal as a Feedstock



Typical Specs	PRB Coal	Lignite
Ash	Low	High
Moisture	Low/Med	Med/High
Variance	Low	High
Consistency	High	Low
Cost	Low	Med

Ft. Union Industrial Park



- The Company owns 20 acres of property on the Fort Union Industrial Park complex in Gillette, Wyoming. Co-located with the plant is 5,000 ft² of office space and approximately 10,000 ft² of shop space.
- One production line is installed and capable of producing 16 million to 18 million pounds of activated carbon per year.
- Subsequent lines are planned in 16 million pound increments of AC production per year which will bring total annual production to 108 million pounds.
- The facility currently has access to road and rail transportation.
- The primary coal feedstock supplier is within three miles with an additional 5 PRB coal mines within a 20 mile radius of the plant.

Environmental Permit



- The Company was granted a minor source emissions permit from the Wyoming Department of Environmental Quality in June 2015. Under this permit, the Fort Union facility can produce up to 108 million pounds of activated carbon per year.

Plant Expansion



- Atlas Carbon has secured a \$15 MM loan from the State of Wyoming Economic Development Program for our Phase II expansion.
- Phase II will have 30 to 50% more overall capacity than Line 1 and will also enhance the plantwide material handling system to accommodate the additional demand.
- In addition, the second production line will immediately reduce overall operating cost by allowing more production during an 84 to 96-hour work week.
- Atlas has further plans to expand up to our permitted 108 million pounds of production as demand is achieved.

Ft. Union Plant



	<u>NOW</u>	<u>AFTER 1st EXPANSION</u>
Employment	15	45
Coal Consumption	30,000 tons	240,000 tons
Lbs of Production	5,000,000	50,000,000

** Atlas Carbon is permitted for up to 108,000,000 lbs. of production, 6 production lines*

Market



- Atlas Carbon is currently testing our product throughout the surrounding area in the coal fired power plants and cement manufacturing to meet Mercury and Air Toxin Standards (MATS).
- Sales of activated carbon to the municipal water treatment is ongoing.

Activated Carbon



- Activated carbon is defined as carbon that has been heated or otherwise treated to increase its adsorptive capacity.
- The key property of activated carbon is adsorption, which allows gases and chemicals to adhere to millions of microscopic pores on the internal surface area of the material. Adsorption should not be confused with absorption (spelled with a B). Adsorption is the adhesion of molecules from a gas or liquid (adsorbate) to a surface of a material (adsorbent). Absorption is the process in which a molecule (the absorbate) permeates or is dissolved by a liquid or solid (the absorbent). So Adsorption is a surface adhesion phenomenon while absorption utilizes the total volume of the material to capture the absorbent.
- “Activating” carbon is the process of making the carbon high in surface area to facilitate adsorption.
- Adsorption opens a world of opportunity for industrial applications. Activated carbon is used to filter water, purify gas, and is even used as an ingredient in prescription medicines.

PFC – Our Patented Next-Generation Process



- Developed over decades, advancing science and engineering, the Atlas PFC process is transformative for activation. It is fast, produces higher yields, and establishes much greater *control* of the finished product. We are uniquely capable of delivering a wide variety of carbons, for many end-market applications. Furthermore, delivering close to a 90% micropore ratio maximizes adsorption potential, putting yet more of your product to work. PFC establishes tenability, efficiency, and maximum cost-effectiveness.

The Pneumatic Flash Calciner (PFC)

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- Atlas Carbon has licensed the patented Pneumatic Flash Calciner (PFC) for activated carbon production from Diversified Industrial Minerals who developed the technology over the past two decades.
- The PFC is a new approach to calcination that reduces capital and production costs. Among others, the PFC is faster, simpler, and easier to operate than competing processes, showcases unparalleled consistency and yields precisely repeatable results, is appreciably less costly than any other technology yielding similar output, and decreases plant size for rapid installation performed incrementally based on market demands.
- The PFC accomplishes “flash” thermal treatment through vortex pneumatic conveying. This means that the process of devolatilization and activation takes mere seconds; design scalability allows for units that can produce 1,000 to 4,000 pounds per hour of activated carbon; and it is a highly effective solution for activation of materials finer than 20 mesh (the size of beach sand).
- The PFC accepts a variety of feed materials, offering adaptability regarding the source being processed.

When compared against Multi-Hearth Furnace and Rotary Kiln Technology has a significant advantages



- Capital Investment: PFC Technology is the lowest capital cost activated carbon production method known
- Retention Time: PFC Technology requires seconds verse hours for conventional technologies
- Carbonaceous Feed Sources: PFC Technology can process Lignite Coal, Sub-bituminous Coal, and Bituminous Coal. In addition cellulosic materials such as coconut, bamboo, and various forms of woods can be utilized with tightly controlled results
- PFC Technology also has lower Operating Cost, Footprint, Warm-up Time and Maintenance requirements

Pores



- Reaction kinetics play a big role in porosity development during the activation phase. The Atlas PFC design allows for rapid, thorough, and uniform activation conditions, whereas with traditional activated carbon production methods, the bulk of the hot carbon's external surface area is in limited contact with the activation gases during much of the carbon's furnace retention time. Our optimal process-control generates a tighter pore size distribution during carbon activation under tighter parameters, yielding a very large percentage of micropores. Micropores are predominantly responsible for adsorption and permanent mercury capture. The result: every particle of activated carbon that we produce has been designed to have achieved maximum adsorption capacity

Products – Vapor Phase



- **AuroraPAC** and **AuroraPAC Plus** are Atlas Carbon's signature vapor phase activated carbons. AuroraPAC has demonstrated excellent vapor phase mercury removal performance. AuroraPAC carbons have outperformed competing activated carbons produced from other methods even those utilizing the same coal supply feed stock. Full-scale side-by-side test results have shown that AuroraPAC carbons have consistently removed a higher percentage of mercury while at the same time requiring less product. AuroraPAC's overall benefit to the customer is significant.
- AuroraPAC Plus is Atlas Carbon's halogenated carbon which is used to remove mercury from industrial coal burning flue gases in compliance with new MACT standards.

Products – Liquid Phase

- AlpinePAC is Atlas Carbon's liquid phase application activated carbon brand. AlpinePAC is primarily produced in powdered form. AlpinePAC will also be supplied commercially as a granular activated carbon (GAC) starting 2017.
- All our products meet AWWA standards
- Certified with NSF/ ANSI 60- Drinking Water System Components-Heath Effects

Questions?