

PETROLEUM COKE: ESSENTIAL TO MANUFACTURING



Petroleum coke, or **petcoke**, is a product produced from all types of oil (light/heavy crudes) during the oil refining process. Many different products are extracted from a barrel of crude oil in addition to gasoline, diesel and jet fuels. Petroleum coke just one of the many. Petroleum coke is not a new product and has been produced since the 1930s. Petroleum coke is a valuable and essential commercial product that is used directly in a wide range of applications including aluminum manufacturing, fuels, and numerous other products including steel, glass, paint, and fertilizers. Petroleum coke is also used as a fuel in power generation, cement kilns and other industries.



Petcoke can take two different forms: green petcoke which is used as a fuel and calcined petcoke which is used as a feedstock by manufacturer for a wide range of products such as aluminum, paints, coatings and colorings which are used by millions of people.

INDUSTRIAL USES OF PETCOKE



Fuel: About 80 percent of worldwide petcoke production is “fuel-grade” petcoke (green coke), used for electricity generation and in cement kilns.



Brick and Glass: Calcined petcoke is used by brick and glass manufacturers because it has a significantly lower ash content compared to other fuels.



Aluminum: Calcined petcoke is necessary to make anodes for smelting and is the only commercially viable method to do so. It boasts a superior combination of electrical conductivity and resistance to chemical and physical degradation in the smelting pot, which contains lower levels of contaminants (i.e. ash).



Paper: Calcined petcoke is gasified to produce ammonia and urea ammonium nitrate, which is then used to produce pulp and paper. The TiO_2 that is produced from calcined petcoke is also used as a mineral that is then used as a whitener for paper.



Paint and Colorings: Calcined petcoke is used in the production of titanium dioxide (TiO_2), a mineral that is used as a substitute for lead in paint. TiO_2 is also used as a pigment in sunscreen, plastic and food coloring.



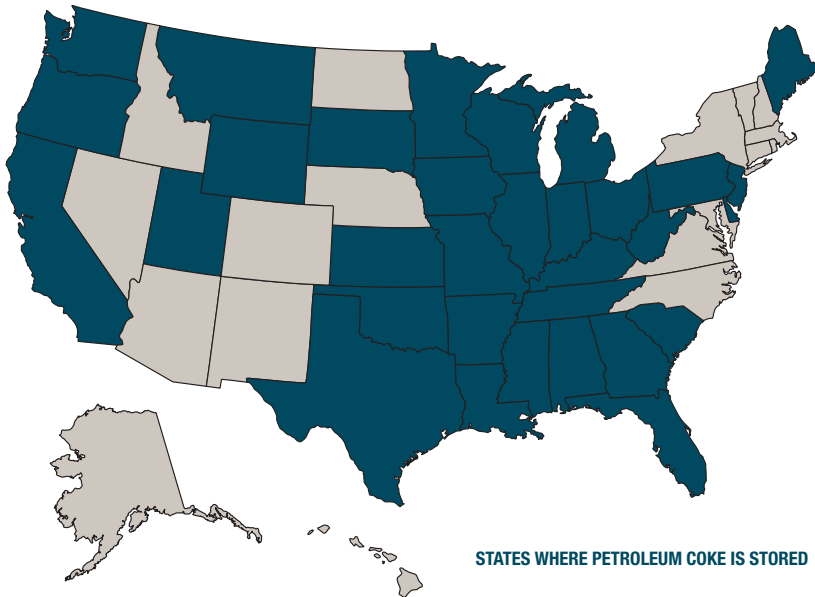
Fertilizer: Calcined petcoke is gasified to produce ammonia and urea ammonium nitrate, which is then used in fertilizer production.



Steel: Calcined petcoke is a partial replacement for metallurgical coal as a feedstock for coke oven batteries, and as a partial substitute for pulverized coal directly injected into blast furnaces. Petcoke that is specially produced to have a needle-like crystal structure is called needle coke. Needle

coke is used to produce the electrodes used in electric arc furnace (EAF) steel production. No other material has needle coke's combination of electrical conductivity and physical properties required for EAF electrodes.

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STATES WHERE PETROLEUM COKE IS STORED

STORAGE AND TRANSPORTATION

Petcoke is safely stored and handled by refineries, intermediaries and end-users. It is transported by ocean freight, barges, rail and truck. Petcoke is stored in 32 states.

- » A majority of refineries that produce petcoke store and manage it in an uncovered venue.
- » 87 percent of intermediaries store petcoke uncovered venue.
- » 78 percent of customers and end-users store petcoke uncovered venue.
- » All employ a variety of dust/control management practices to limit fugitive dust.

THE ENVIRONMENTAL PROTECTION AGENCY AND PETROLEUM COKE

The Environmental Protection Agency (EPA) classifies petroleum coke as a highly stable product which is non-reactive at ambient conditions. EPA defines petcoke as having a "low health hazard potential" with no observed carcinogenic, reproductive or developmental effects. Petroleum coke is chemically inert, does not react chemically in water, does not dissolve in water, is not bioavailable by organisms (organisms cannot absorb it) and does not bioaccumulate (does not concentrate harmful substances) in organisms.

REGULATIONS GOVERNING PETROLEUM COKE

Petcoke storage and handling facilities are governed by a wide range of federal and state environmental and safety regulations. These include:

- » Petcoke storage and handling facilities are or can be required to obtain approval of Fugitive Dust Control Plans. These plans are mandated either through the Clean Air Act or state law.
 - State agencies monitor storage facilities to ensure that fugitive dust does not become a nuisance.
- » Petcoke storage facilities are subject to the Clean Water Act and are often required to obtain industrial storm water permits and submit a Storm Water Pollution Prevention Plan. These plans also address:
 - Employee training
 - Preventative maintenance
 - Risk identification
 - Spill prevention and response procedures
 - Recordkeeping and internal reporting
- » The International Fire Code, adopted by most states, requires facilities producing combustible dust to obtain operational permits. Facilities must obtain combustible dust permits which must adhere to National Fire Protection Association standards.