

**Has your carbon black supplier mentioned an upcoming period of supply allocation and price increases? Aemerge<sup>®</sup> has a potentially powerful solution.**

### What is Happening?

There are a variety of factors behind such supply constraints, which include:

- 1) Oil refineries are more efficient in internally processing the residual oil that previously was sold to produce carbon black
- 2) Chemical olefin units have moved from heavy to light feedstock for their crackers and are not producing the residual oil that was sold into carbon black
- 3) The economic recovery and increase in auto sales are driving up the demand for carbon black used in tires
- 4) New carbon black plant emission control regulations will make expansions more costly, limiting the incentive to increase supply

### Reduced Supply of Carbon Black Feedstock

According to the U.S. Energy Information Administration, the quality of crude oil has degraded over the past 15 years as the supply of easy-to-refine light sweet crude has diminished. The API or density of crude has increased and as a result, refineries have installed cokers to take advantage of the lower cost, poorer-quality crude, such as Western Canadian Select and other heavy crudes that represent 70% of the known remaining global crude supply. The cokers allow the refineries to crack these heavy, bottom-of-the-barrel products and convert them into transportation fuels at higher yields. In fact, a coker can turn over 80 percent of the residual oil into valuable liquid products, such as gasoline.

Carbon black is made out of No. 6 Fuel Oil, which is a high-viscosity residual oil. "Residual" means the material remaining after the more valuable cuts of crude oil have boiled off. With the refineries' major investments in cokers as of late, the "residual oil" is being cracked into more valuable products. As a result, there is less supply of the carbon black feedstock, and thus carbon black prices are rising.

While there has been a sizeable increase in U.S.-produced light sweet crude from North Dakota and other domestic locations, refineries are still able to process the heavier crude as it continues to be priced at a discount, and the added volume produced from these new cokers adds significant incremental sales revenue.

The olefin units which generate the basic building blocks for the chemical industry have moved to light feedstock as a result of the shale oil fracking boom. Existing units as well as all new U.S.-based crackers are being converted or built to handle this light E/P mix. This generates orders of magnitude less residual oil that in the past was sold to carbon black suppliers. With a 20- to 30- year time horizon, the chemical companies have placed their bet on shale oil fracking to supply their new olefin units.

Carbon black will see continued pricing pressure even if the refineries begin to refine more domestic light sweet crude, as the cokers will be used to generate incremental volumes and sales to meet demand. Thus there will continue to be less "bottom of the barrel" residual oil to supply the carbon black market, regardless of refining sourcing choices, for the foreseeable future.

## Increased Demand for U.S. Carbon Black

In addition to the supply constraints of residual crude, the recent jump in auto sales has increased the demand for carbon black for automotive tire production (70% of global carbon black demand). According to a monthly sales forecast developed by J.D. Power and LMC Automotive, North American vehicle production is up 5% through November over the same time frame in 2012, which equals nearly 700,000 additional cars and 2.8 million tires. Globally, according to the International Organization of Motor Vehicle Manufacturers, more than 85 million vehicles are expected to be produced and sold; or more than 340 million tires, up 1.6% as of mid-2013. According to Modern Tire Dealer Magazine, more than 240 million replacement tires will be sold just in the U.S., also up about 2%. Accordingly, even as sources of oil for carbon black production become more restrictive, tire demand, and thus carbon black demand, is increasing in its dominant market.

## Emission Controls

This past November, Cabot, the 2nd largest U.S. carbon black producer, agreed to pay a \$975,000 fine and spend \$84 million on pollution control technology at plants in Louisiana and Texas. According to Bloomberg BusinessWeek, the EPA and U.S. Department of Justice said this is the first agreement toward their enforcement of the Clean Air Act's New Source Review provisions for carbon black manufacturers. This creates higher operating costs that will need to be passed onto customers; it also makes expansions more expensive and somewhat less attractive.

## Cumulative Carbon Black Usage Impacts

As you can see, the factors behind supply constraints in the carbon black industry are severe and deeply rooted in the economics of petroleum refineries and petrochemical olefin units, the continued trend of tighter emission controls, and an economic recovery.

## What is Aemerge's Potentially Powerful Solution?

To protect your business operations, it is time to look for an alternative or supplement to petroleum-derived carbon black that reduces the price and supply impacts forecast for non-tire, traditional carbon black users. One such opportunity is via Organic Black, an "extender" to supplement traditional carbon black for use as a colorant in plastics, non-reinforcing rubber, paints, and inks. Organic Black is a sustainable product created from raw pallet wood.

Organic Black is produced by Aemerge's patent pending Carbonizer® technology and is NSF 61 certified as safe for human water and Food Chemical Codex passed for food contact. It is classified as a USDA bio-preferred product and has passed the EPA 313 analyses for the presence of metals, as well as passed the CONEG heavy metals in packaging test. USDA organic product certification and FDA certification also are underway to further confirm Organic Black's lack of hazardous materials such as those of petroleum based products like polycyclic aromatic hydrocarbons (PAH) and benzo(a)pyrene (BaP), both of which have stringent health restrictions.

Organic Black reduces petroleum usage for carbon black production, is at least 30% less expensive than traditional carbon black, and is not dependent upon oil prices and supply and demand fluctuations.



*Shouldn't you be evaluating how Organic Black provides increased pricing and supply stability for your carbon black sourcing requirements?*

For more information on Organic Black and its application efficacies, please visit [www.organicblack.com](http://www.organicblack.com) or call 317-797-1600.