

## **PCW'S Guide to the Propylene Market**

By Mark Quiner

Volatility in US propylene prices is inevitably accompanied with coded terms like feedslates, splitters, alky values and RGP spot prices. This is the PetroChem Wire's guide to decoding the propylene market.

### **PROPYLENE PRODUCTION FROM STEAM CRACKERS**

Propylene monomer (PGP) is produced by two methods in the US. The first is as a byproduct of ethylene production in a steam cracker. Steam crackers often have the ability to switch feedstocks - ethane, propane, butane, light naphtha and gas oil – based on market conditions. Ethane is the lightest feedstock, and yields the smallest quantity of propane, while light naphtha and gas oil are the heaviest and yield the most propylene.

Feed slates are determined based on the cost of producing one pound or tonne of ethylene minus the value of the propylene and other co-products produced from this stream. The value of the co-products in this calculation is called a co-product credit. Rising propylene prices create a larger co-product credit for heavier feeds versus light feeds since this yields more propylene per pound of ethylene. This essentially lowers the cost to produce a pound of ethylene.

### **SPLITTERS, REFINERIES AND RGP**

PGP is also produced from refinery grade propylene in a plant called a splitter. RGP is a crude stream that contains propane and propylene that comes from an oil refinery's fluid catalytic cracking unit (FCCU) during gasoline production. Chemical companies will buy this RGP, run it through their splitter to separate the propane from the propylene and get PGP.

Oil refiners are in the business of making gasoline, not propylene or polypropylene. They will often look at two components to determine where they can fetch the best price for their RGP – the spot RGP price and an alky value. An alky value is an extrapolated price that tells the value of the RGP into an alky unit.

An alky unit is where alkylate is made. Alkylate is a blendstock that can be used to bring gasoline to proper specifications. Many alky units make alkylate from RGP. Refiners are always looking at the price they can sell RGP to splitter operators versus the value they get from putting the RGP into their own alky unit.

Each refinery is different and therefore has a different alky value. Also, each refiner has different contractual obligations as it relates to how much RGP they sell to chemical companies versus how much they can put into their alky unit. However, propylene market observers look at a daily alky value using a standard formula, which can be found in the PetroChem Wire's RGP focus, to spot trends. For example, if alky values are significantly higher than spot RGP for an PetroChem Wire extended period of time, then they may deduce that when possible refiners are diverting more RGP to the alky unit and selling less to the chemical market.

When a steam cracker favors light feeds, then chemical companies will often purchase more RGP to make up for lost propylene production from steam crackers. Conversely, when heavy feeds are favored, then there may be less demand for RGP because more propylene is being produced during ethylene production.

## **PRICING AND LOGISTICS**

Propylene monomer is largely tied up under long-term supply contracts, and priced using a monthly negotiated contract market. Spot trades are infrequently, and only involved producers and consumers. There is currently no third-party storage available for PGP, and therefore traders are not involved in the domestic propylene market.

PGP is mostly transported by pipeline, but there are also a few companies that sell and purchase PGP by railcar. When spot PGP deals happen they typically are for delivery by pipeline FOB Mont Belvieu, Texas.

Refinery grade propylene is also largely tied up under long-term supply contracts, but spot trades are more frequent. As a result, the industry will often look at RGP spot prices as a price discovery mechanism for PGP. If RGP prices move higher, then a splitter operator may try to increase PGP prices because costs are going up and they want to maintain a margin over RGP. Since a significant amount of PGP in the US is produced from a splitter, this economic model has wide-ranging implications for the entire US propylene market.

RGP spot prices are typically for pipeline delivery FOB Mont Belvieu. However, a significant quantity of RGP is transported by rail and truck. Sometimes spot deals are confirmed FOB Mont Belvieu, Texas for rail or truck, which can carry a discount to the pipeline market due to added logistics expenses.

## **TERMS :**

**PGP** – Polymer grade propylene, propylene monomer

**RGP** – Refinery grade propylene

**Splitter** – A unit that makes PGP from RGP

**Steam cracker** – A unit that makes ethylene from NGLs such as ethane, propane, butane and light naphtha

**Co-product** – Chemicals produced in the process of making ethylene in a steam cracker. Co-products include propylene, butadiene and aromatics.

**Feedslate** – The cocktail mix of NGLs a steam cracker uses to produce ethylene. Light feeds produce more ethylene and less propylene, while heavy feeds produce more propylene and less ethylene. Feedslates change based on the price of NGLs and the value of the ethylene and the co-products.