



Serving our Refining & Petrochemical Customers with:

- Technologies, catalysts, chemicals and sorbents
- Professional services and technical support
- Always with the highest integrity and EHS standards

Working with our Partners and Suppliers to Deliver:

- Innovative technologies, products and services
- New value creation opportunities
- Value-priced products



**G. W. Aru, LLC** is founded on the principles of Integrity, Innovation and Value. We specialize in sales, marketing and technical support services for catalysts, sorbents, chemicals and related technologies and services for the petroleum refining and petrochemical industry. We provide a channel-to-market for our manufacturing partners and we work with them to develop new and innovative products to meet your needs, thus offering you new value-creation opportunities. Our objective is to offer you the best-value solutions through our ability to access a robust portfolio of products and services which our highly-experienced team can tailor to meet your unique requirements.

#### **FCC Additives:**

We are developing a full line of **Ultra FCC Additives**<sup>®</sup> manufactured by our OEM partners and suppliers in the USA, China and Europe. Independent QA/QC is provided by Cat Testing Labs, Inc (CTL), which is trusted by many refiners to provide quality assurance of catalysts produced by US-based and overseas manufacturers. These additives can be packaged in any manner to meet your requirements and we can work with our logistics partners and suppliers to further optimize the material handling requirements and costs for your additive usage needs. Our **Ultra FCC Additives**<sup>®</sup> include:

- **Great FCC Promoters**<sup>™</sup> (**GFP**<sup>®</sup>) - new and innovative, patent pending platinum- and palladium-based CO oxidation promoters that bring value to our refining customers by providing excellent CO promotion at significantly reduced Platinum Group Metals (PGM) content and thus reduced cost. Our promoters are also proven to reduce NOx emissions compared with our competitor's CO promoters. Super Low NOx (**GFP/SLN**<sup>®</sup>) variants of our Pt- and Pd-based **GFP**<sup>®</sup> are in development using patent pending technologies to further reduce NOx emissions. Currently manufactured in Europe and soon also to be Made In The USA!
- **Buster FCC Additives**<sup>™</sup> - Bust-Out the molecules you don't want in your FCC stack emissions and in your product yields while Busting-Down the high prices you have been paying for these additives, many of which are based on technologies and expired patents from the last millennium. Our **Ultra SOxBuster**<sup>®</sup> (**USB-M60**<sup>™</sup>) hydrotalcite-based SOx additive is proven to reduce your costs of SOx emissions compliance compared with our competitor's additives. We also offer a spinel-based SOx additive, **USB-M30**<sup>™</sup>. With manufacturing in both China and the US, we can mitigate to cost impacts of tariffs and potential rare earth export restrictions which may be imposed by China. Other Busters are in developments for NOx (**Ultra NOxBuster**<sup>®</sup>), Coke (**Ultra CokeBuster**<sup>®</sup>), Main Column Bottoms (**Ultra MCBuster**<sup>®</sup>) and Gasoline Sulfur (**Ultra GSBuster**<sup>®</sup>).
- **Booster FCC Additives**<sup>™</sup> - Boost the molecules you want in your FCC product yields and thus Boost your refinery's bottom-line. Our **Booster FCC Additives**<sup>™</sup> also feature the price-busting technology of our **Buster FCC Additives**<sup>™</sup> to help you manage your operating expenses. We feature **Ultra C3Booster**<sup>®</sup> for high propylene yields and are developing **Ultra C4Booster**<sup>®</sup> for selective butylene yields and **Ultra C8Booster**<sup>®</sup> for octane.
- **Opter FCC Additives**<sup>™</sup> - enable you to address performance issues with your FCC operation. In addition to our **Ultra FlowOpter**<sup>®</sup> additive available now to address fluidization issues, we are developing several other additive concepts with our OEM and laboratory partners

#### **FCC Catalyst and Additive Addition Systems:**

We are pleased to be working with Pneumix to offer their addition systems in North America. For 25 years, Pneumix has provided cost-effective, reliable and precise control of catalyst and additive additions at over 100 overseas FCC units.

**FCC Catalyst:**

We are working with outstanding OEM partners offering innovative and value-creating technologies which we can tailor to meet your specific FCC performance requirements and operating budget constraints. Our team provides local sales and technical service support along with full laboratory QA/QC testing, e-cat analysis and diagnostic/trouble shooting analysis capabilities through our relationship with Cat Testing Labs, Inc. (CTL).

**FCC Catalyst Testing:**

Our team can help you develop catalyst testing protocols to improve your catalyst selection process and coordinate testing and results analysis with testing laboratories such as CTL, Inc. and CPERI.

**Claus Catalyst:**

Working with Euro Support and ASM Catalysts, we offer a full range of Claus sulfur recovery catalyst packages, including their unique and innovative titania-CoMo product. Selection recommendations to optimize performance and catalyst life are provided along with guarantees.

**Syngas, H<sub>2</sub> and other Refinery and Petrochemical Catalysts and Sorbents:**

We are very excited to offer Magma's Magcat Textured Catalyst Technology™ steam methane reforming catalyst which is now operational in multiple refinery and DRI SMRs providing significant increases in hydrogen production and unit efficiency. Magma's patent-pending revolutionary technology to create 'pelleted' catalysts that are the same from a handling and loading perspective as those currently used, including the ability to use in-tube temperature probes, but are significantly advanced from a technology perspective. This eliminating the need for significantly more expensive, complex and difficult to use technologies (e.g., metal foils) proposed by others to achieve just some of the benefits that Magcat™ offers.

Working with UNICAT Catalyst Technologies, Inc., we offer innovative and cost-effective products for:

- Syngas and refinery hydrogen production
- Refinery purification applications
- Pressure Swing Adsorption (PSA)
- Refining/bed grading AFS
- Cat-Poly catalyst
- Alky Selective Hydrogenation, including innovative skid-mounted units





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