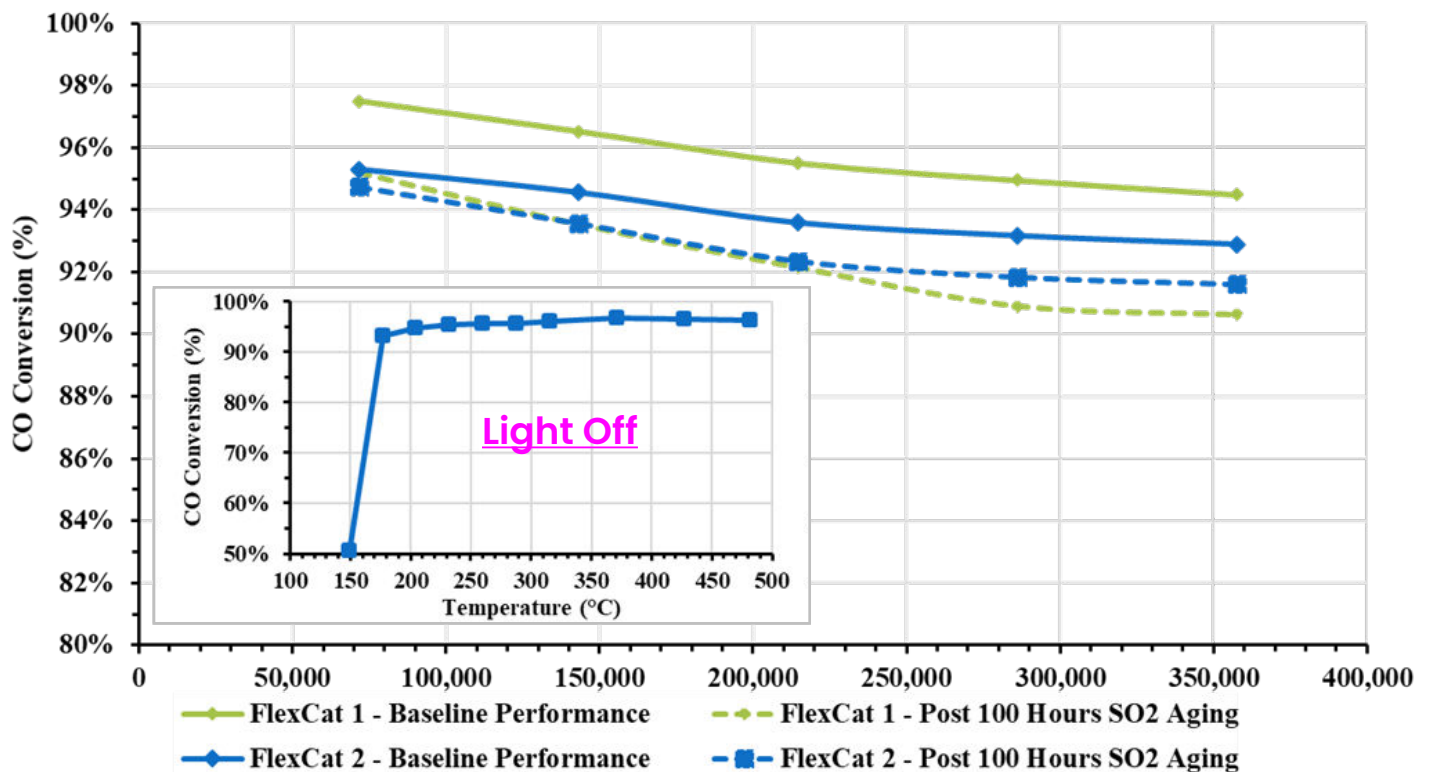


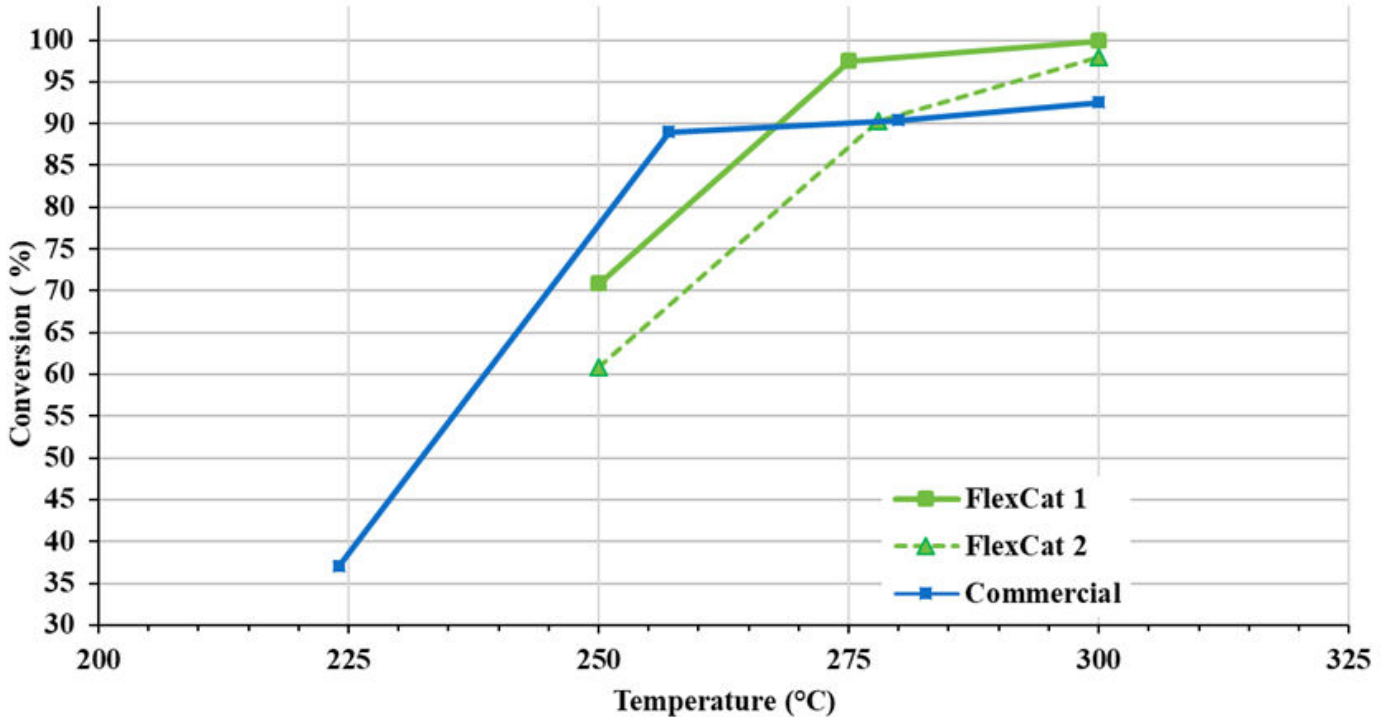
## Emission Abatement with FlexCat™

As the world prioritizes decarbonization to battle climate change and environmental impacts, greenhouse gases emitted from chemical production, oil refining and other major manufacturing processes have been put in the spotlight to make major changes to reduce their carbon footprint. Alkegen, as a specialty materials company, has been focused on delivering products to enable the world to breathe easier and live greener for over 80 years. Using our innovative fiber manufacturing experience, Alkegen has created FlexCat™—a revolutionary, high-surface area, fiber-based, flexible catalyst support solution that does what other products can't by maximizing surface area and catalyst contact, enhancing cost-effectiveness, and increasing yield or conversion with reduced catalyst weight in the system. For emissions abatement systems focused on carbon monoxide (CO), volatile organic compounds (VOCs), and/or nitrogen oxides (NOx), FlexCat provides lower temperature light-off using less catalyst such as platinum group metals (PGMs).



In a recent study done at Environex, Inc., Alkegen put FlexCat through a robust series of tests demonstrating effective and durable CO oxidation at high space velocities and low temperatures under fresh conditions and after sulfur aging. With platinum/palladium loaded onto FlexCat, the sample was able to maintain conversion greater than 94% through space velocities to 350k hr<sup>-1</sup> at a temperature of about 290°C. Alkegen then reduced the platinum/palladium loading by 20%, to 80% of the original PGM mass and still saw similar high conversion through 350k hr<sup>-1</sup>. The samples were then aged with sulfur over 100 hours and both samples maintained over 90% conversion throughout the aging regardless of space velocity. Additionally, the light-off of the aged sample was investigated. 95% conversion of CO was achieved at only 200°C and 98% of CO was converted at 290°C. This study further proves the conversion effectiveness that FlexCat delivers from increased specific surface area and catalyst contact, regardless of PGM loading and system conditions.

FlexCat also performed a study on conversion of volatile organic compounds (VOCs) at a European catalyzer. Compared to a current commercial palladium catalyst, the FlexCat sample coated with 30% less palladium was able to convert 100% of toluene in the stream at 300 °C while the conventional catalyst only reached 93% conversion at the same temperature. Alkegen then reduced the palladium loading further on the FlexCat substrate to only 20% of the loading compared to the conventional substrate and was able to convert 98% at the same 300°C. These results substantiate that FlexCat substrates allow for a significant reduction in PGMs while still providing high conversion of harmful emissions.



These new studies continue to prove out the effectiveness of FlexCat in providing a significant step change across the catalysis value chain. A reduction in metal loading and temperatures required for high conversion directly supports the company’s decarbonization efforts. By incorporating FlexCat technology into existing industrial emission control systems, customers can use less energy while reducing their emissions output and their carbon footprint.

## Partner with FlexCat

Customizable for individual partners, processes and specific reactions, FlexCat can be manufactured at scale today. Alkegen is currently looking to expand their customer validation group testing FlexCat. To learn more on this new data or to begin a design study for a particular application, please visit <http://alkegen.com/flexcat/> or email [info@alkegen.com](mailto:info@alkegen.com).

## About Alkegen

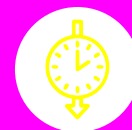
Alkegen is a global leader in developing and providing high-performance specialty materials designed to positively impact the environment by saving energy, reducing pollution, and improving fire safety for people, buildings, and equipment. More information is available at [www.alkegen.com](http://www.alkegen.com). For updates, follow us on Twitter, LinkedIn, and Facebook.



Maximize abatement with fiber



More throughput



Cleaner production and less downtime



Maximum plant yield with reduced carbon footprint