TITAN CATALYTIC

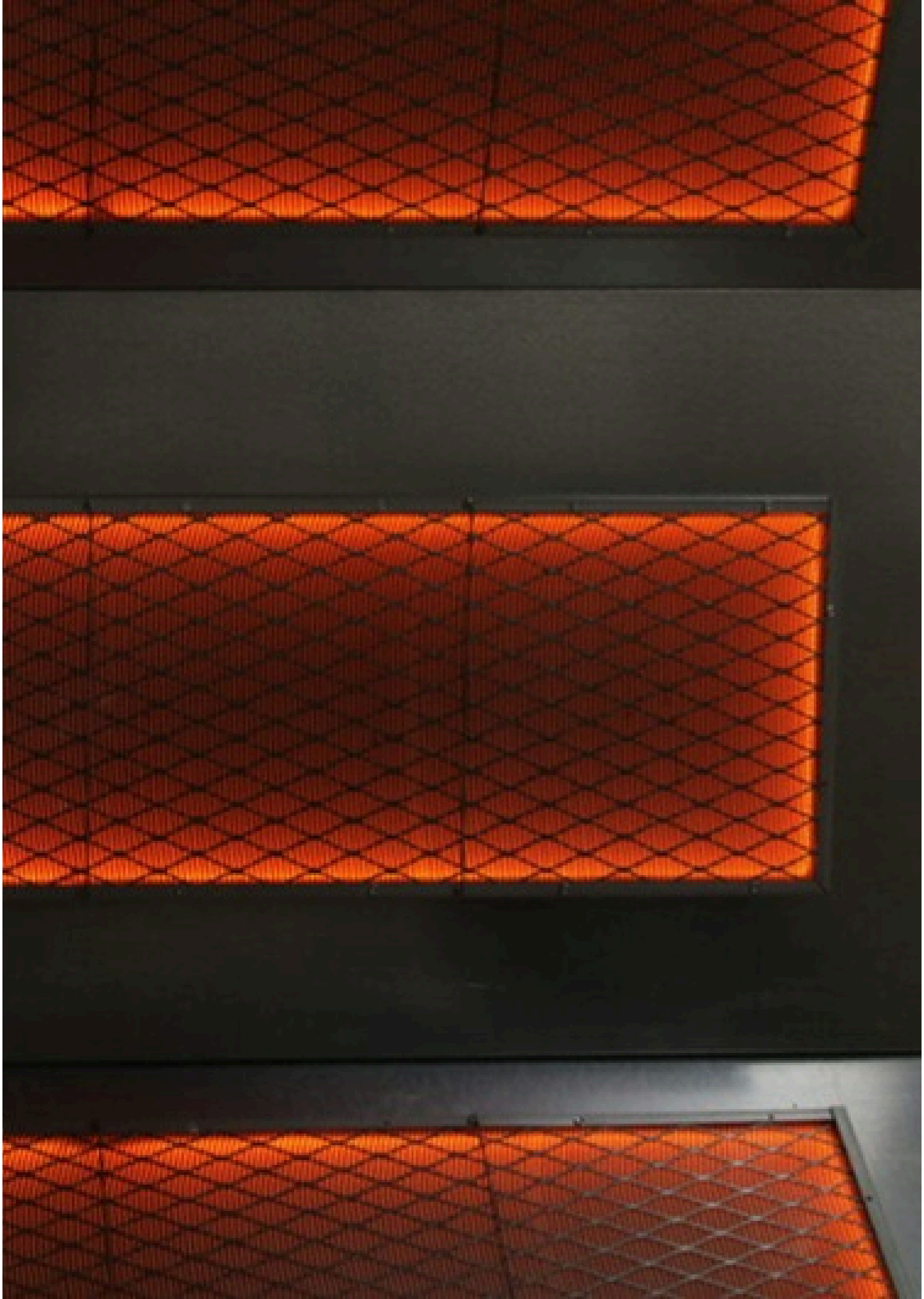
TITAN IR TECH

GAS CATALYTIC IR HEATERS, OVENS & REFURBISHMENTS

LOWER ENERGY COST HIGHER OUTPUT

How Catalytic IR Is Revolutionizing Production & Finishing Lines

CONTENT



THE LATEST TECHNOLOGY IN
GAS CATALYTIC INFRARED HEATING

TITAN-Catalytic's heating technology is engineered to **deliver superior performance through precise, controllable infrared heat**. Its ability to generate low and consistent heat levels ensures uniform energy distribution, making it ideal for curing heat-sensitive substrates and demanding finishing applications.

By introducing natural gas or LP gas, a platinum catalyst initiates a flameless chemical reaction that converts the fuel's energy into infrared heat. This **infrared energy is distributed evenly across the heater face**, avoiding the high concentration points common with high-intensity IR burners and providing controlled, uniform heating for consistent process results.

Unlike conventional convection systems that heat the surrounding air and then transfer heat to the product, **TITAN-Catalytic infrared technology directs energy at the coating itself**. Whether curing powder or liquid paint, infrared energy promotes faster pre-gel and cure times while minimizing the amount of heat absorbed by the part. As a result, products often exit the process cooler and can be handled, packaged, or shipped sooner.

Catalytic heating has become a preferred alternative to traditional convection systems due to its energy efficiency, compact design, and process performance.

By investing in a TITAN-Catalytic Gas IR heater, manufacturers can reduce energy consumption, save valuable floor space, and benefit from exceptional low-level output control that exceeds industry standards.

Free Parts Testing Program

See the difference before you invest! At TITAN-Catalytic, we offer **complimentary parts testing** to help evaluate how Gas Catalytic Infrared can improve your curing process.

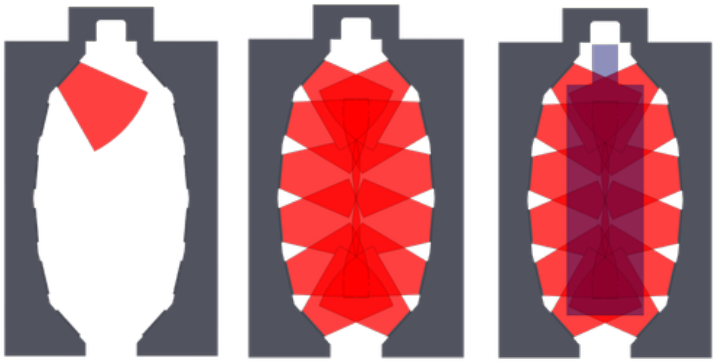
Simply contact us to discuss your application and schedule testing. Once arranged, send us your uncoated parts and powder, and we'll return the finished samples along with process feedback for your review and inspection.

Whether you're looking to reduce cure times, improve finish quality, lower operating costs, or benchmark against your current process, our testing program is designed to provide real-world results for your application.

66%
reduction in cure time

50%
reduction in overall costs

45%
reduction in footprint



The Key to a Perfect Coat: Ray Tracing & Zone Configurations

Achieving a flawless finish requires more than simply generating heat — it requires delivering that heat evenly and precisely across the entire product surface.

TITAN-Catalytic systems utilize advanced **Ray Tracing technology** to optimize infrared energy distribution throughout the curing process. Unlike convection systems that rely on circulating heated air, infrared energy travels in direct paths from the heater face to the product. This allows engineers to analyze how infrared energy interacts with complex part geometries, **ensuring all surfaces receive the appropriate heat exposure** and minimizing cold spots or uneven curing.

Our catalytic heater faces emit infrared energy in a controlled full-coverage pattern, allowing systems to be designed for maximum heat uniformity and efficiency.

Ray tracing is only part of the equation. TITAN systems can also be configured with **multiple independently controlled heating zones**, both vertically across the part and throughout the oven length. This allows heat output to be tailored to specific product requirements, improving cure quality, process flexibility, and energy efficiency. Unlike conventional convection ovens that are often limited to a single heating zone, TITAN's zoned approach provides greater control and optimization throughout the curing process.

The result is **improved coating adhesion, reduced defects, faster cure times, and greater process repeatability**. Whether curing powder coating, liquid paint, composite materials, or specialty finishes, TITAN's engineered infrared systems provide the precision needed for reliable, high-quality results.

INVEST IN QUALITY

ADVANTAGES OF GAS CATALYTIC IR

TITAN offers the latest in long wave to medium wave infrared heating technology. Our Gas Catalytic IR heaters provide a powerful and efficient solution for manufacturers seeking greater control, faster processing speeds, and lower operating costs.

Unlike traditional convection ovens that heat the surrounding air first, **Gas Catalytic IR transfers energy directly to the product surface for faster, more efficient curing** and heating. This targeted heat transfer reduces energy waste, shortens process times, and delivers consistent results across a wide range of industrial applications.

SPACE SAVING DESIGN
Our compact oven designs require less floor space, creating more room for production capacity and workflow efficiency.

FLEXIBLE CONTROL
Independently controlled zones operate from 20% to 100% output for precise heat application. Settings can be saved as recipes and quickly recalled for fast, repeatable changeovers.

FASTER CURING
Achieve curing times up to 66% faster than traditional convection ovens, increasing throughput while reducing overall energy consumption.

UNIFORM COVERAGE
Catalytic heater faces emit infrared energy in a controlled broad coverage pattern, delivering even heat distribution across the product surface.

ENERGY BILL SAVINGS
Converting from electric IR to Gas Catalytic IR can reduce operating costs by up to 50%, with some installations achieving annual energy savings exceeding $90,000.

BENEFITS:

- Ultra-Low CO Emissions with Zero NOx Generation
- Maintenance-Free Design with No Moving Parts
- Compatible with Natural Gas or Propane
- Simple Installation with Universal Mounting Brackets
- Pre-Assembled, Plumbed, and Wired Modules for Simplified Installation
- Available in Industrial Voltages from 208V to 575V
- UL 508A Approved Controls for UL and cUL Applications
- Multiple Zoning Capabilities with TITAN Controls and Gas Management Systems

VERSATILITY OF GAS CATALYTIC IR

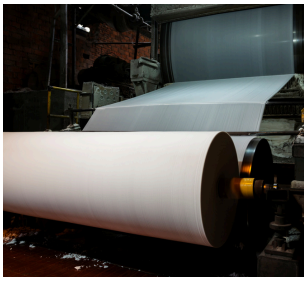
TITAN's technology delivers versatile, high-performance heating solutions for a wide range of industrial processing applications, offering efficient and reliable results across countless products, materials, and production environments.

Powder & Liquid Coat Finishing

Tank & Cylinder Coating and Refurbishment

Alloy & Steel Wheel Coating

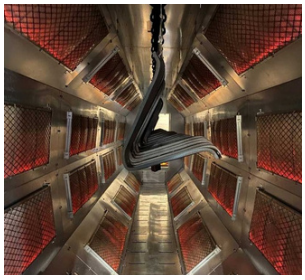
Fences & Railings



Textile & Paper Processing

MDF, Plywood & Heat Sensitive Substrates

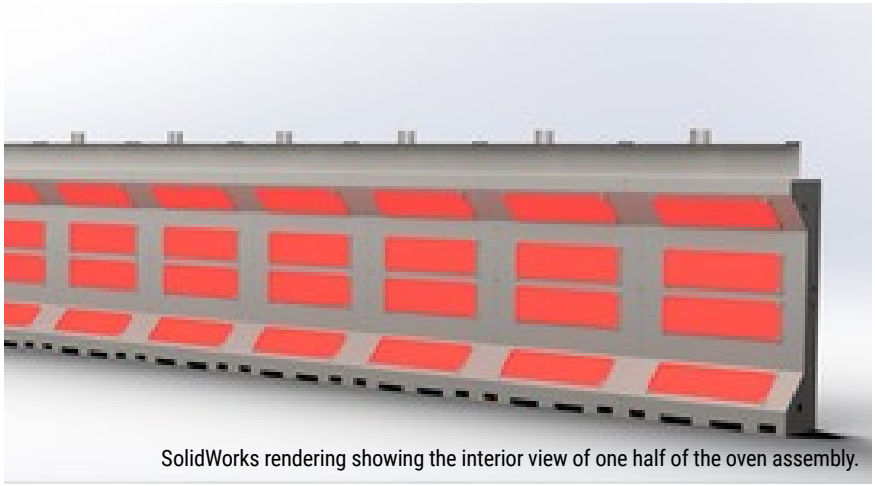
Drying & Heating of Organic Materials



Booster & Pre-Gel Ovens

In-line & Rotary Thermoforming

TITAN Heater Details



SolidWorks rendering showing the interior view of one half of the oven assembly.

TITAN-Catalytic heaters are engineered to provide **reliable, efficient, and highly controllable infrared heating for demanding industrial environments.**

Designed for durability and performance, TITAN heaters feature rugged welded steel construction, maintenance-free operation with no moving parts, and ultra-low emissions with zero NOx generation. Available in both natural gas and propane configurations, they offer flexible operating capabilities across a wide range of process applications.

Unlike convection systems that rely on circulating air, catalytic infrared heaters deliver energy directly to the product surface. This eliminates air movement that can disturb uncured powder, helping reduce cross-contamination and improve coating quality. For this reason, catalytic infrared is often used in Booster and Pre-Gel Ovens, where stabilizing the coating prior to final cure can improve transfer efficiency, reduce fire risks from loose powder, and enhance overall finish quality.

With **turndown capabilities from 100% to 20%, operators can precisely tailor heat output to production needs.** TITAN systems are also available with multiple zoning configurations, allowing independent control of heat intensity throughout different sections of the oven. Combined with TITAN Controls and Gas Management Systems, this **improves process control, efficiency, and production flexibility.**

In addition to heater performance, TITAN oven systems are designed to maximize floor space and simplify installation. Compact footprints create more production capacity, while universal mounting systems allow for easy integration into existing lines.

Every TITAN system is engineered for the customer's application, production requirements, and facility layout. From powder coating and liquid paint curing to textile processing, composite manufacturing, food dehydration, and specialty industrial applications, **TITAN-Catalytic delivers dependable infrared heating solutions built for long-term performance.**

Size	BTU/Ft2	TOTAL BTU/Hr.	Gas Flow Natural (CFH)	NG Pressure (in WC)	Gas Flow Propane (CFH)	LP Pressure (In WC)	Startup Voltage	Startup Amps
12" X 60"	7,000	35,000	35	4	14	11	240/480	5.8/2.9
12" X 72"	7,000	42,000	42	4	16.8	11	240/480	6.8/3.4
16" X 20"	7,000	15,600	15.6	4	6.2	11	120/240/480	5/2.5/1.3
16" X 40"	7,000	31,100	31.1	4	12.44	11	240/480	5/2.5
16" X 51"	7,000	39,700	39.7	4	15.84	11	240/480	6.8/3.4
16" X 60"	7,000	46,700	46.7	4	18.64	11	240/480	7.63/3.82
24" X 48"	7,000	56,000	56	4	22.4	11	240/480	8.3/4.2
12" X 48"	7,000	28,000	28	4	11.2	11	240/480	5.8/2.9

BREATHE NEW LIFE INTO YOUR HEATING SYSTEMS

TITAN refurbishment services restore aging infrared heating equipment to peak performance, helping extend equipment life, improve efficiency, and reduce costly downtime without the expense of full system replacement.

Over time, heat exposure, contamination, and daily production demands can reduce heater performance and increase operating costs.

TITAN's refurbishment process begins with a complete evaluation of your equipment to identify worn or damaged components and determine the best path forward. Our technicians then **rebuild and restore systems using high-quality replacement parts and proven refurbishment techniques** designed to maximize reliability and performance. **We offer refurbishment services for both TITAN-Catalytic equipment and all other major manufacturers**. Services include replacement of platinum catalytic pads, preheat elements, controls, and other critical system components.

Note: The most common cause for having to perform routine rebuilds is because of overspray of powder and the fouling of heater surface.

Refurbishment can improve energy efficiency, reduce operating costs, extend equipment lifespan, and minimize unexpected production interruptions. Whether supporting a single production line or an entire facility, **TITAN delivers refurbishment solutions tailored to your process, application, and operational goals.**

YouTube

Visit **@TITAN-Catalytic** on YouTube for heater refurbishment tutorials.

CLIENT SUCCESS STORY

HEAVY EQUIPMENT, HIGH EXPECTATIONS:

How ASTEC Industries Enhanced Coating Quality with TITAN-Catalytic

Astec Industries is a global leader in manufacturing heavy-duty road building equipment amongst many other product lines.

With over 16 brands under their name and more than a century of innovation, they've mastered manufacturing rugged, heavy-duty machinery used in everything from rock quarries to road paving. These machines operate in some of the harshest environments imaginable — exposed to heat, moisture, debris, and demanding workloads.

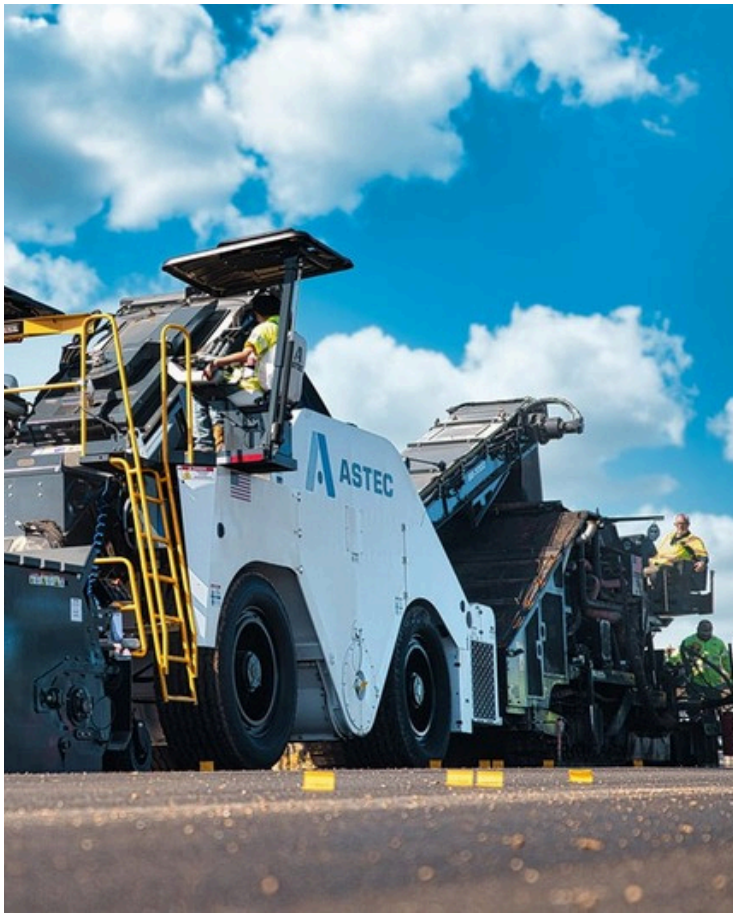
Durability isn't just a bonus; it's an absolute requirement. And with that said, Astec's machines represent a significant investment for customers, who in return expect long-term durability and minimal maintenance. One compromised part — a chipped coating or corroded part — can lead to rust, failures, downtime, and costly repairs. That's why the integrity of the powder coating and curing process is mission critical.

Yet until recently, Astec faced significant challenges in maintaining coating quality and turnaround times. Their standard mode of operation by outsourcing their coating process introduced delays, quality inconsistencies, and logistical complications. With over 250 uniquely sized parts in their catalog, shipping components off-site for finishing and re-inspection was inefficient, costly and just a logistical nightmare for the Production Department.

The Turning Point: Bringing Coating In-House

In 2021, Astec initiated a strategic review of their finishing operations. The question at hand was whether they could regain control and improve both quality and efficiency by bringing the powder and liquid coating processes in-house?

After evaluating the long-term benefits, Astec chose to develop their own internal line. After significant review and vetting, they selected TITAN Catalytic as the partner to provide core oven technology and automation controls, custom-built to meet the exact needs of their operation.



Astec Roadtec SB-3000 Shuttle Buggy® Material Transfer Vehicle stores and transfers hot-mixed asphalt material from truck to paver for non-stop paving.

The Solution: Tailored Equipment for Oversized Parts

With a partner selected, the next challenge was designing a system capable of handling Astec's uniquely demanding parts. The parts are not only numerous, but large — many are awkwardly shaped, heavy, and difficult to maneuver. That meant off-the-shelf solutions wouldn't cut it. TITAN worked closely with Astec to develop a vertically oriented production line, designed to handle the company's specific geometries and material needs.

TITAN Catalytic installed a custom 12 foot high and 40-foot Pre-Gel InfraRed oven that gels powder quickly and uniformly before the parts enter the convection curing process. Pre-Gel ovens are critical on a line like this, as the Convection Oven utilizes moving hot air to cure the parts efficiently. This same movement of hot air can unfortunately have a negative impact on the powder on the parts

unless it has been partially cured first. Only a light, uniform gel layer is required — precisely what the Pre-Gel IR oven is designed to achieve before parts move into convection curing.

This dual-stage approach (IR gel + convection) enables Astec to optimize energy use by reducing convection time and operating at lower temperatures while still achieving a strong, uniform cure and a high-quality finish.

"TITAN's IR Oven gave us the flexibility to run a wide range of parts by allowing us to dial in the energy needed to correctly gel powder on parts based on part thickness. From the design phase to post-install support, the TITAN Catalytic team was there every step of the way. Their responsiveness and attention to detail helped us get the system running smoothly and confidently."

— Chris Hohol,
Manufacturing Engineer, Astec Industries

New Control System: Smarter, Safer Operations

A key aspect of this project was automation — and so TITAN Catalytic alongside of ETTER Engineering developed acustom Control Panel System with a Human Machine Interface (HMI).[KD1] The HMI was installed into the Main Control Panel Cabinet for the entire line; the interface allows the Lead Person to remotely adjust recipes and monitor oven performance in real time from one single location. The lead operator now has full control from a single location— able to adjust recipes and monitor performance in real time without leaving the control station. This eliminates unnecessary movement along the line, minimizes downtime, and removes the need for operators to enter hot oven zones or halt production for manual adjustments.

Cost Savings and Energy Efficiency

Bringing the line in-house has already delivered significant savings. No more shipping parts off-site, no more delays in inspection or rework, and now Astec has full control over quality — right on their factory floor.
Including the TITAN IR before the Convection Oven gives Astec the ability to experiment with and increase conveyor speed on certain groups of parts, reducing the load on their convection ovens. Thanks to the IR pre-gel stage, less time and lower heat are required downstream. TITAN also provided a red-sheet evaluation for blower motors in the convection ovens, offering additional opportunities for optimization.

Results: Total Control, Higher Quality, and Continued Long-Term ROI

Since launching their in-house coating system with TITAN Catalytic's support, Astec Industries has:

- Reduced costs from fewer outsourced parts, and minimized rework
- Improved quality assurance, with full Q/C handled onsite
- Energy efficiency, with smarter oven zoning, lower temperatures and recipe control
- Safer work conditions, Improved ergonomics through remote-access automation and HMI control
- Enhanced flexibility, enabling the line to accommodate even more part sizes and designs than originally planned with streamlined changes on the fly

By building a fully customized line, Astec ensures that every component — from the largest machine base to the smallest bracket — meets their rigorous quality standards and stands up to the real-world demands of their industry.

CLIENT SUCCESS STORY

OFF-ROAD ACCESSORY HITS HIGH GEAR

Rock Slide Engineering designs and manufacturers high quality parts and accessories for various four-wheel drive platforms including Jeep, Ford, Toyota, and the Mercedes- Benz G-Class. They are popular among 4x4 enthusiasts with standout products such as the Step Slider, which is known for its quality and dual functionality. This unique product not only protects vehicles while navigating rocky terrain, but also serves as a fully integrated power step, providing easy access for drivers and passengers in lifted vehicles with oversizes tires. When the car door is opened, the Step Slider extends a full 12 inches down for seamless entry. Once the door closes, the step automatically retracts to sit flush with the body of the Slider, ensuring smooth access for all users.

The Step Slider is protected by a robust, textured black powder coat that adheres to acid etched 11-gauge steel. The internal components are made from stainless steel and aluminum to prevent rust and enhance durability. Designed for easy installation, this plug-and-play system utilizes factory mounting points, requiring no drilling. Its standalone wire harness eliminates the need for splicing or rewiring, allowing customers to retain their manufacturer warranty after installation.

Navigating Production Inefficiencies Through Partnerships

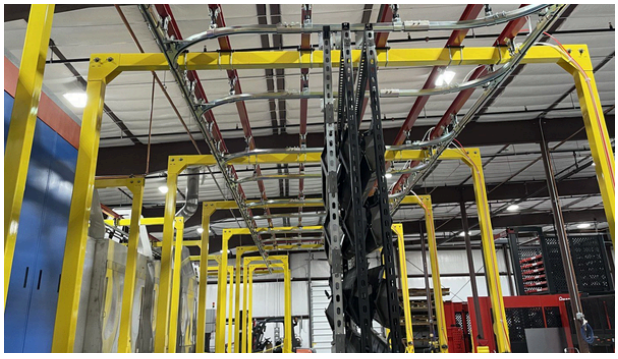
In 2019, Rock Slide Engineering was primarily operating with a traditional batch style powder coating system. This manual push-and-pull method required substantial labor and was becoming inefficient as the company grew, particularly when running extended shifts. Rock Slide was facing rising demands and needed a solution that could boost production without breaking the bank. They knew they needed to invest in automating their systems if they were effectively going to capture this opportunity. With this in mind, Rock Slide Engineering partnered with TTIAN-Catalytic, NIKO Conveyors, and a California-based system integrator to address production line needs with new equipment and automation to streamline processes. This collaboration led to the integration of several key components designed to optimize efficiency and enhance product quality, while reducing labor need associated with the manual handling of parts. A project such as this can be a significant undertaking for any manufacturer, but Rock Slide Engineering was committed to doing what was necessary to improve processes and set the stage for future growth.

First, a TITAN-Catalytic dry off oven was integrated into the line to remove residual water from parts after a three-stage was process spanning 40 feet. This ensures parts are completely dry before reaching the booth for powder coating.

Following the dry off phase, parts move into the automated powder booth for a fresh application of powder. Here, robotics have now replaced manual labor, significantly reducing human intervention, while ensuring consistent part quality across the production line.

Next, the parts enter the TITAN-Catalytic pre-gel oven, which preheats the powder coated components to achieve proper gel consistency before they are transferred to the convection oven. This pre-gel process essentially starts melting the powder with enough gelling to withstand the air movement the parts are subjected to in the cure oven. Without this crucial pre-gel step, the airflow in a typical convection oven could negatively impact the coating's final finish, making this a vital part of the overall process.

The NIKO Conveyors overhead conveyor system played a key role in Rock Slide's new system, optimizing material handling through a combination of manual and automated processes. Rock Slide selected an enclosed track and trolley system to fit their part handling profiles. These trolleys and load bars are capable of handling load capacity up to 352 pounds while requiring nominally only 1-4% of the load's weight when moved manually. When there is manual intervention needed, the ease of part handling with this conveyor is a major ergonomic benefit for the staff.



In addition to the manual system, the new setup also includes nearly 200 feet of automated chain conveyor. This feature ensures consistent speed and precision part handling throughout the powder coating process, meeting Rock Slide's manufacturing demands. The variable speed control of the automated conveyor provides flexibility, allowing for the handling of parts with varying sizes and metal thicknesses without compromising efficiency.

A standout feature of their system is the custom-built conveyor drop lifts, which are designed to lower and raise sections of track during the loading and unloading processes. This ergonomic innovation helps reduce the strain of manually lifting heavier parts, benefiting all involved.

Together, this 50/50 system streamlined the movement of parts through the powder coating and curing processes, minimizing the need for manual intervention while maximizing throughput.

Transforming Production through Automation & Efficiency

The integration of TITAN-Catalytic ovens and NIKO Conveyors led to a significant transformation in Rock Slide's production process. The company graduated from a labor intensive, batch-based system to an automated, streamlined operation.

The new system allowed Rock Slide to process parts more efficiently, reducing the need for additional shifts and labor all while boosting overall production capacity. Improvements in production capacity, quality control, and labor efficiency have afforded Rock Slide Engineering the opportunity for sustained growth and enhanced profitability in a competitive landscape.

"We anticipate our production to rise to about 3,000 Step Sliders a month"

,says Dave Luman, CEO of Rock Slide Engineering. Colton Schenk, a mechanical designer with Rock Slide Engineering, adds, "Upgrading to an automated line has minimuzed scrap and reduced manual handling of parts. The improved automation chain has drastically enhanced our operations."

Increased Production Capacity:

Rock Slide Engineering tripled their production capabilities. Previously, their batch system handled 120 units per day; but with the new automated line, they were able to increase their capacity to approximately 360 units daily. Remarkably, they now operate only four days a week, and the plant achieves in approximately a week and a half what previously took the entire month to produce. Doing more with less is an advantageous approach which has been nicely achieved with this project.

Enhanced Quality Control:

With automation reducing the amount of manual handling necessary on the plant floor, the incidence of defects has dramatically decreased. The streamlined process improved the consistency and quality of the finished products, while delivering higher production volumes.

Labor Efficiency:

The automated system led to a 60-76% reduction in the need for additional labor. Instead of increasing their workforce to handle higher production demands, Rock Slide maintained the same number of employees while significantly boosting output, bringing those important dollars down to the bottom line.

Rock Slide Engineering's investments to update equipment and processes have transformed their production process beyond expectations. Moving from a labor-intensive batch system to an automated line, Rock Slide not only met but was now in position to exceed the demands of their major clients. This strategic collaboration has significantly boosted production efficiency while improving product quality, enabling Rock Slide to scale while maintaining their high standards.

With a continued focus on innovation and operational excellence, Rock Slide Engineering remains a leader in the off-road industry empowering enthusiasts across the country to tackle new adventures with confidence.

By: Lee McWhorter
Technical Sales Specialist, TITAN-Catalytic

SAFETY AUDIT

ANNUAL MAINTENANCE

MINIMIZE RISK. MAXIMIZE OUTPUT.

Is Your Facility Up to Date on Annual Maintenance Inspections?

TITAN recommends a comprehensive annual maintenance inspection to ensure all operational and safety systems are performing efficiently, reliably, and at peak operating capacity.

Services Operations Inspection

- Verify and adjust incoming gas pressure as necessary
- Verify each Zone Control Module's low and high operating pressures
- Adjust regulators for proper performance
- Inspect heaters for contamination or physical damage
- Clean accumulated powder or debris from heater face screens
- Evaluate heater protection from falling parts or process contamination

Safety Systems Testing

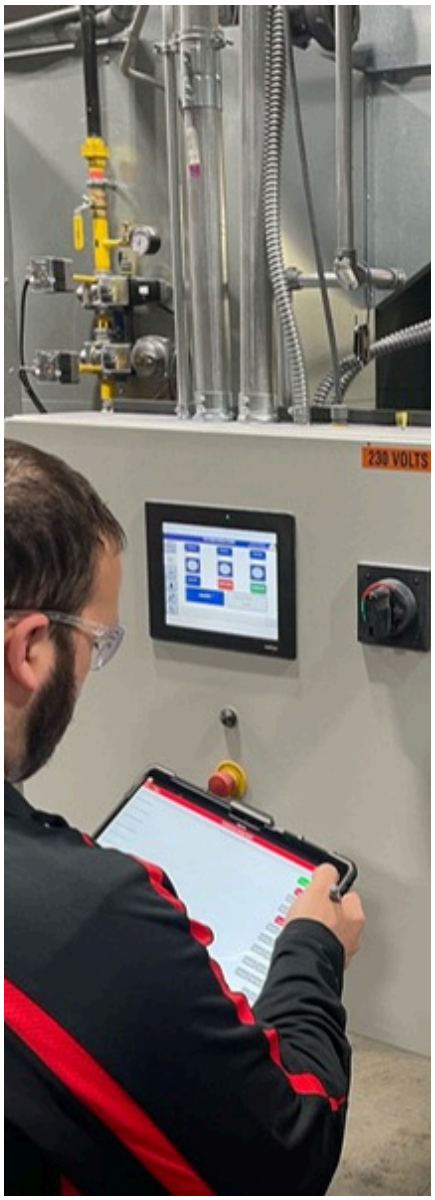
As recommended by NFPA-86, Section 7.4, all safety circuits should be tested annually, including:

- Main valve-train high and low gas pressure switches
- Valve-train safety shutoff valve leak testing
- Emergency stop interlock testing
- Thermo-switch interlock circuit testing
- Exhaust flow interlock verification
- High-temperature safety interlock testing

Scope of Work & Pricing

For a typical oven system, the Operations Inspection generally requires approximately 3–6 hours, depending on the number of zones and accessibility of the Zone Control Modules. Safety testing typically requires an additional 4–8 hours depending on system size and configuration.

- **Service Rates:** Competitive rates based on project scope and location.
- **Critical Spare Parts Package:** Essential replacement components recommended to support routine maintenance and reduce unplanned downtime.
- **Expanded Spare Parts Inventory:** An enhanced inventory of critical and application-specific components designed to maximize uptime and ensure rapid serviceability.



Recommended Spare Parts

TITAN recommends maintaining critical spare components, including:

- Gas pressure switches
- Zone regulators and solenoids
- Pre-programmed PLCs
- Spare Zone Control Module assemblies
- Replacement I/O cards (if applicable)
- Zone control relays
- HMIs and power supplies
- Exhaust pressure switches
- Heater panels as needed
- Spare thermo-switches

POWER YOUR PROCESS WITH NIKO CONVEYORS

NIKO Conveyors provide customizable overhead material handling solutions designed for strength, precision movement, and long service life. Ideal for manufacturing, finishing, assembly, and automated production environments where reliable product flow is critical.

NIKO Conveyors are engineered to support loads up to 4,400 lbs. with smooth, reliable performance. Scan the QR code or contact us to learn more about our custom solutions.

READY TO GIVE YOUR PRODUCTION LINE A MAKEOVER?

We understand how important it is to have a reliable curing process, and we're confident that TITAN-Catalytic can provide it. Whatever your application may be, we can benchmark your current process against Gas Catalytic IR technology to demonstrate performance improvements and design a properly configured solution for your operation.

Contact us to learn more!

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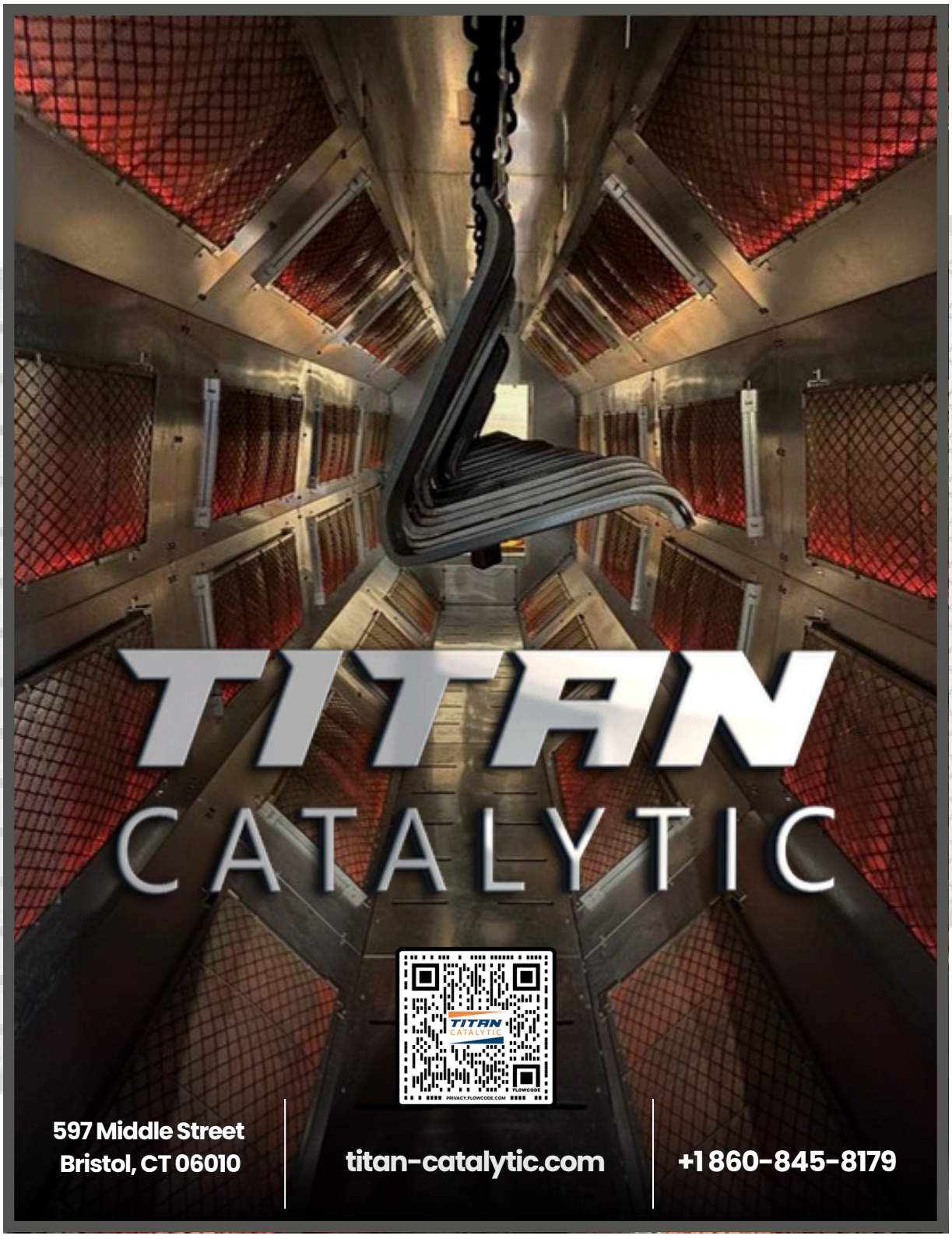
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