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with Practical Benefits for  
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## WHERE TIRES DARE NOT TREAD

Utility companies can rely on industry-specific rubber track carriers

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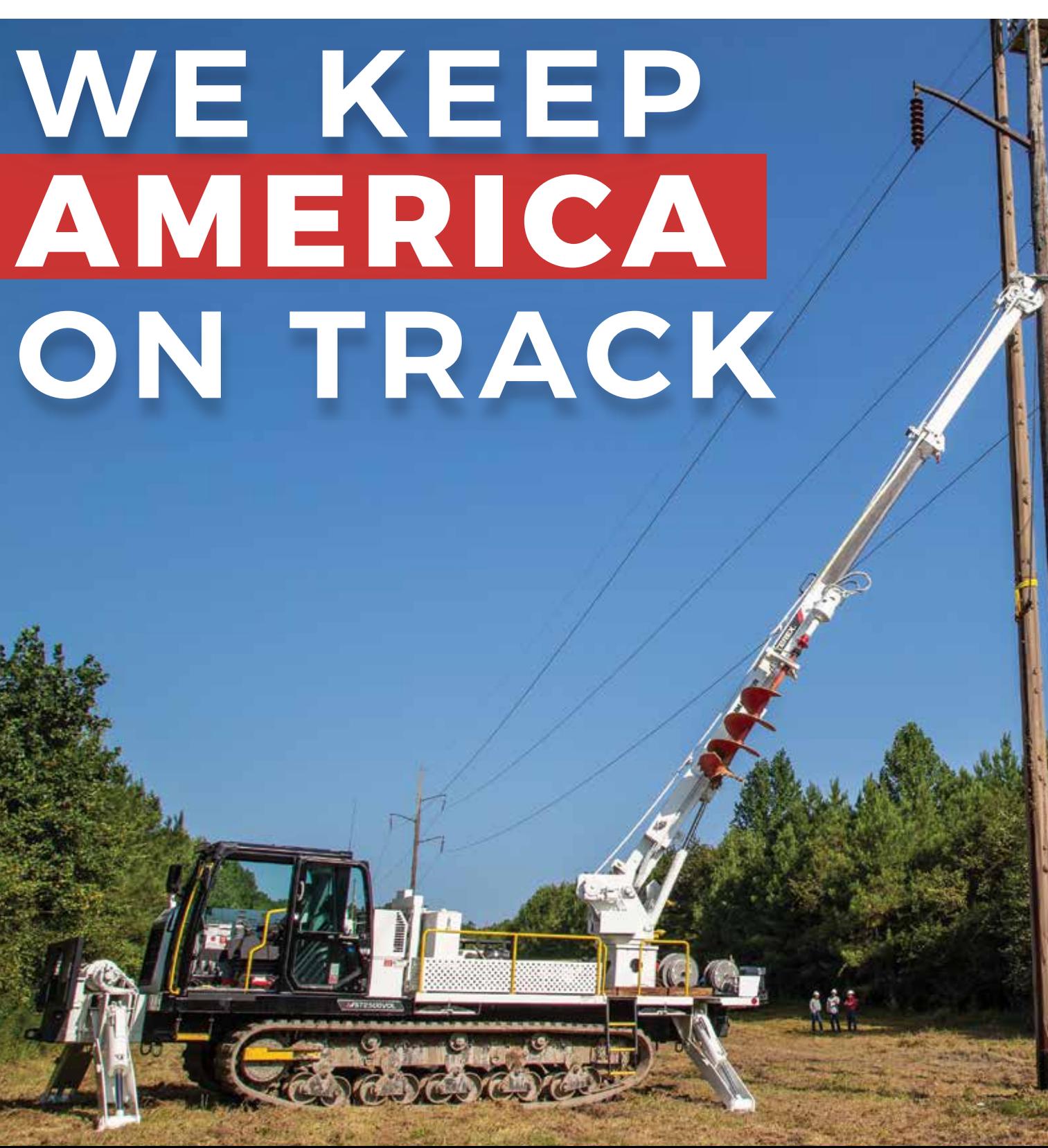
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# THE UTILITYSOURCE

Products and Services for Today's Electric, Telecom, and CATV Utilities

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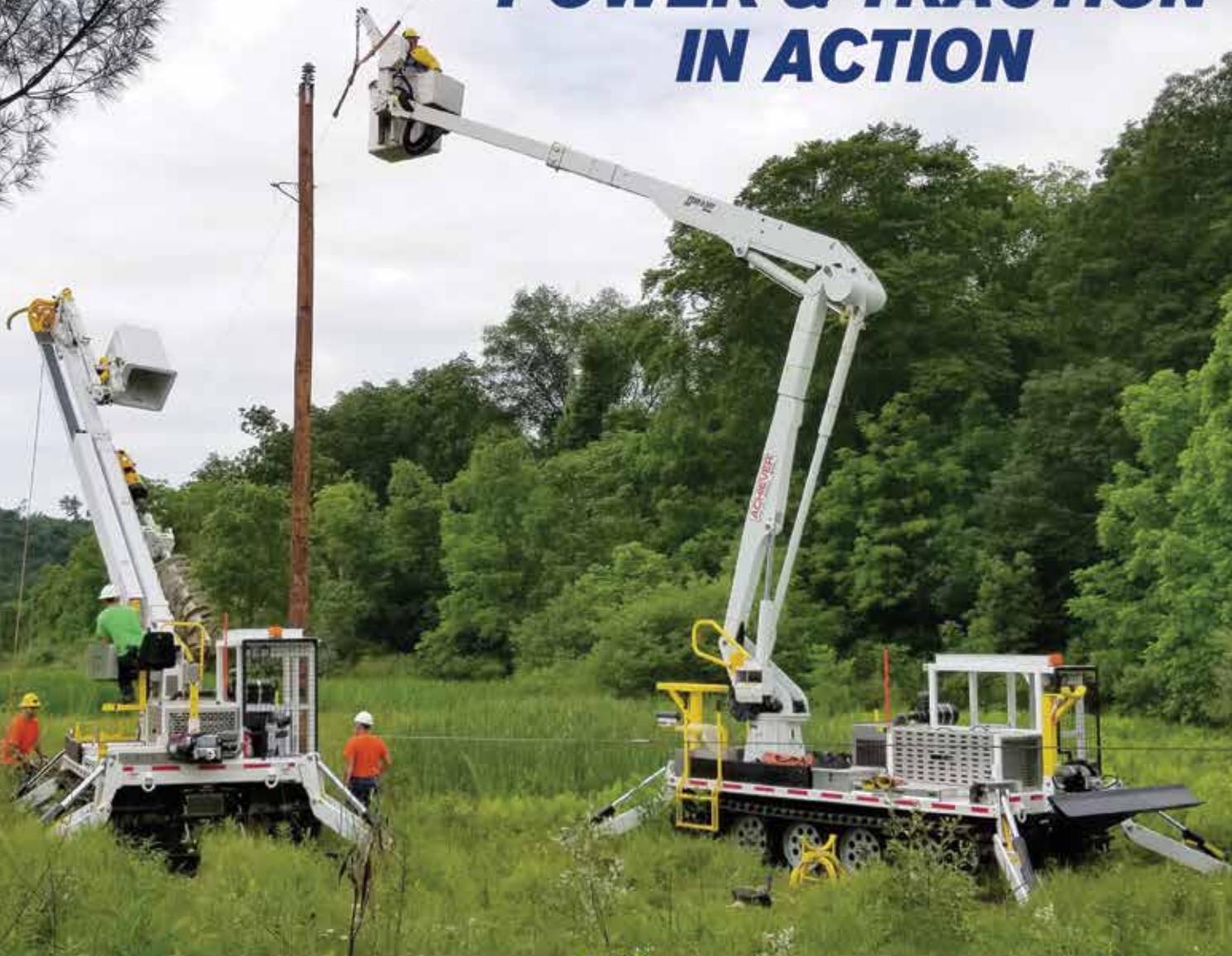


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# WHERE TIRES DARE NOT TREAD



## Utility companies can rely on industry-specific rubber track carriers

The convenience of wheel-mounted equipment makes trucks and trailers ideal for over-the-road transport, but they are rendered useless by a utility installation or maintenance job in compromised ground conditions. Rubber track carriers, on the other hand, get people and equipment to utility applications in places wheeled carriers cannot go, such as jobs on soft wet ground or undeveloped or protected environments. The track carrier spreads the load over a large surface area, lowering ground pressure while providing a highly stable equipment platform to work from.

While most manufacturers have designed their track carriers from snow grooming machines, Morooka designed its carriers specifically for heavy-duty use in rigorous agriculture, forestry and construction applications from the bottom up. That same industry-specific dedication is at the core of Morooka USA LLC, headquartered in Ashland, Virginia, since 2005. Morooka is the only manufacturer of rubber track carriers wholly made in America, with models designed and built specifically for use in North American applications.

Now Morooka has added a rubber track carrier line dedicated to the North American utilities industry.

Ken Byrd, president of Morooka USA said the company is always looking at how to meet the unique needs of end-users. "We had looked at what our construction models were doing for the U.S. oil and

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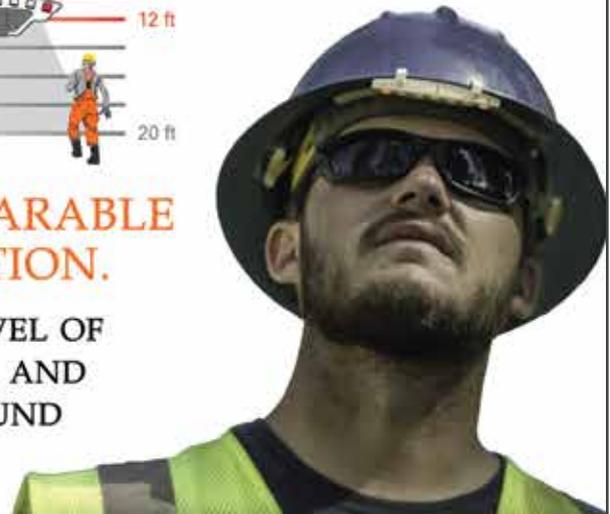
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gas industry. So much of that work is installing pipeline infrastructure in remote, undeveloped, hard-to-access areas. We realized the same was true for the utilities industry. Electrical transmission and distribution lines are often in those same types of environments. Our construction models could be retrofitted to meet most of their needs, and there are other manufacturers that do exactly that. But Morooka has always matched its models to the job.”

That’s why five years ago Morooka USA began working with North American utilities customers to create a dedicated line of Tier 4-compliant carriers, the VDL-series. “We are committed to the utilities industry. We’ve pushed the limits of what carriers can do for them with the 125-foot bucket reach of the 4500VDL. To be able to go off road in any environment at that size and price point – one client has already told me it’s a real game-changer for them.”

*Utilities-specific*

The VDL models have the same robust design of Morooka’s construction carrier models, and like them, are made from U.S. steel, by U.S. personnel with U.S.-based customer support. Beyond that, Byrd said, the carriers differ in several key ways.

“One of the primary differences is engine placement,” Byrd said. “Construction models have center-frame mounted engines, but utilities companies attach digger derricks and bucket lifts to the carriers. They need room to mount the masts and to lay them down for ease of transport. We keep the center well freed up by offsetting the engine.” Byrd noted that the open center well has also been advantageous for attaching personnel carriers and hydro-seeders.



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Another major change has been accommodating attachments common to the utilities industry that require extended frames. "Again, it's because our design and manufacturing facilities are right here in the U.S. Our frames are built right here, so it's easy for us to customize them to North American equipment specifications. We don't have to piece on an extension to an existing frame. We simply build one solid frame to whatever the specs call for." The built-to-spec frame eliminates any

concern for overstressing a weld at the extension, since there is no extension welded on. "Our frames are solid."

Curt Unger, Morooka USA Vice President of Sales, said the ability to build to spec has additional benefits. One is mobilization readiness. Most of the VDL models meet the DOT-approved width of 8 feet 6 inches for permit-free transportation. "Utility companies might need to respond immediately

at any time," Unger said. "When they get called out because a snowstorm Friday evening took down a distribution line, they can't be held up waiting through the weekend to get a permit. With our carriers, they just go."

Byrd said, "We manufacture a good share of our utilities models as OEM proprietary designs," Byrd said. "We'll custom-design and build to the dimensions they specify." Customization is made easier by the new carrier line's mounting frames, which duplicate the mounting frame of a wheeled carrier to easily accept digger derricks and lift buckets without special adaptation. "Other makes of carrier need a sub frame," Byrd said. "Ours does not. One of our OEM clients told me this has been saving installers about 40 to 50 hours of build-time per unit. Fewer man-hours and lower material cost represent a huge savings on every Morooka carrier installation."

*Morooka tough*

Unger said reliability is critical to utilities applications. "Your track carriers will get you to places that wheeled vehicles just can't go – so that much farther from help if

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you need it. Take the snowstorm scenario again as an example. You need to get your equipment out there on a weekend, and you need to trust that it won't let you down once you're there."

Unger said that's why Morooka carriers make such good vehicles for the utilities industry. The line of carriers shares the robust build of all Morooka lines. One key area is tread and carriage. The aggressive, straight bar tread pattern favored by the construction and oil and gas industries gives utilities customers the same benefits: increased traction, reduced tearing and wide ground pressure disbursement to track easily over muddy or sandy soils.

"That's one of the most common concerns I hear about rubber track carriers, tread life," Unger said. "How does rubber hold up? But all our tracks were made specifically for long life under rigorous use." Morooka tracks feature its Continuous Steel Core technology. Their helically wound steel cords have no inside joints to fail. The one-piece design also prevents stretching and derailing. "CSC eliminates about 95 percent of the traditional causes of rubber track failure," Unger said.

"Our treads also have a greater number of contact points than other makes." Greater contact with the ground, Unger said, lowers ground pressure, placing less stress on any given contact point with the treads and contributing to a longer service life. "Overall our units average ground pressure is less than a man's footprint."

The footprint of the average human male exerts a ground pressure of about 8.0 psi. The MST-1500VDL model with 225 hp Tier 4 Cat engine exerts a ground pressure of only 2.6 psi, though the unit is 23 feet 8 inches long with a width of 8 feet 6 inches and weighs 21,660 pounds. Fully loaded to its 20,000 pound maximum capacity, its ground pressure is only 5.0 psi.

The largest of the 8 foot 6 inch wide Morooka models to date is the MST2500VDL with 250 hp



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Tier 4 Cat engine. At 27 feet 6 inches long, it weighs 29,000 pounds and exerts a ground pressure of 2.6 psi. With a 30,460-pound maximum load, its ground pressure is still just 5.1 psi.

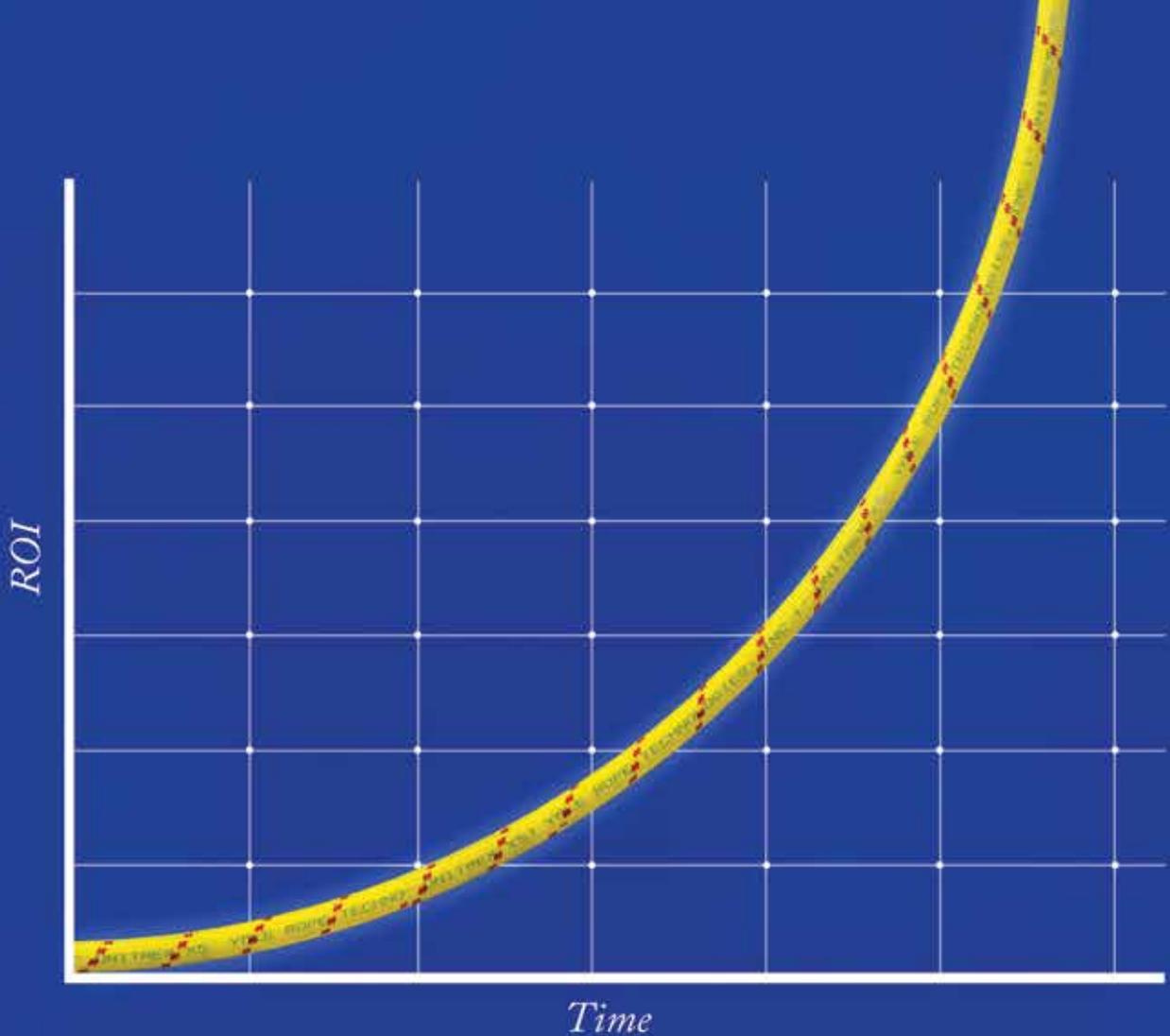
Morooka carriers are easy to maintain, and excellent parts availability minimizes downtime for service and repair. All engines for the North American market feature top brand-name, Tier 4 engines from Cummins, Cat and Kubota. "And the fuel tanks, the cabs, the frames – 95 percent of everything on our carriers is made right here in the U.S., so we have excellent in-stock availability of the most commonly needed parts, with total parts availability for our carriers rated at about 88 percent at any given time."

Operator safety and comfort surpass standards for the North American market. Units feature ROPS-certified frames and cabins, Danfoss® joystick controls and easy-to-read digital display, backup cameras, and heated remote mirrors.

Morooka USA rubber track carriers have hydrostatic transmissions and come with a one year, 1,000-hour warranty. Morooka's industry-leading dealer, parts and service network ensures coast-to-coast after-sales product support throughout North America. The new line of purpose-built machines gives utilities end-users a rubber track carrier dedicated to the unique work they do that they can count on wherever and whenever they need to do it.

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## Terex Utilities to Demo Industry Leading Products & Technology with Practical Benefits for Users and Owners

Terex Utilities will feature industry-leading technologies and equipment during the 2019 International Construction & Utility Equipment Expo (ICUEE) in Louisville, Ky. “ICUEE presents a unique opportunity for Terex to engage with customers through live equipment demonstrations,” said Joe Caywood, Director of Marketing. “Likewise, it gives industry stakeholders a chance to identify the product solutions that are important for their success.”

Terex Utilities will utilize the ICUEE venue to once again present concept equipment designs in order to collect customer feedback. Caywood added: “Customers will get a sneak peek of a new solution with technology that delivers actionable information, which is designed to help electric utilities improve overall fleet performance.”

New products include a family of articulated and telescopic transmission aerial devices. The Transmission TL Series includes three models, offering a wider range of chassis options for working heights up



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to 112 ft. The company will demonstrate the Transmission TL Series, as well as other digger derricks and aerial devices that deliver economical cost of ownership and high productivity. Twice daily demonstrations also include:

- The C4047 digger derrick with a Stand Alone Core Barrel auger tool.
- Hi-Ranger Articulating Telescopic LT40 aerial device equipped with HyPower IM idle mitigation and Positive Attachment Lanyard device.
- Hi-Ranger Non-Overcenter Optima TC55 aerial device with Load Alert, featuring updated screen display.

In addition, Terex Utilities is celebrating the 75th Anniversary of its digger derrick product line, representing the company's legacy of innovation. On display will be Tel-E-Lect digger derrick Model T15, mounted on a Dodge Power Wagon, circa 1956. Established in 1945, Tel-E-lect digger derricks helped to mechanize the jobsite making it easier, safer, and more productive to build powerlines. "We have a legacy of being the first to deliver solutions that changed the industry – going all the way back to the first mechanical digger derrick," said Caywood. "We have continued to innovate and improve the products

for 75 years to support the important job of keeping our electrical infrastructure up and running." All of the company's product demonstrations at ICUEE 2019 feature similar industry leading technologies.

Snap a photo of the vintage digger derrick and see daily live equipment demonstrations at Terex Utilities' booth L316 or visit <https://www.terex.com/utilities/icuee> for more information.

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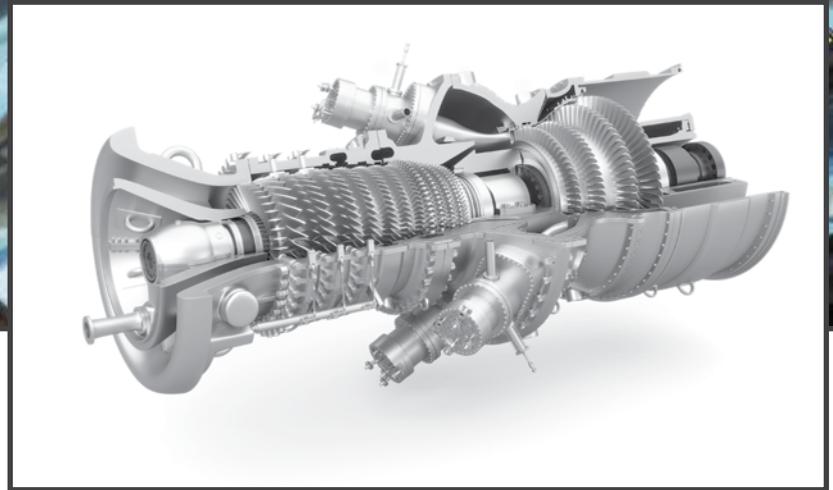
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# PVD Coatings Extend the Life of High-Value IGT and Steam Turbine Components



*Newly developed PVD coatings provide superior erosion and corrosion protection for high-value turbine components, improving efficiency and reducing MRO costs*

Industrial Gas Turbine (IGT) manufacturers and MROs are continually seeking new ways to improve the performance and longevity of critical components. To achieve this, high-value components must be designed and manufactured to withstand increasingly extreme temperatures, particle erosion and hot gas corrosion stress.

Given the critical role of IGTs to utilities and bulk users of power, improving efficiency and extending operating life of critical components is the key to managing costs while maximizing efficiency and up-time. Even seemingly minor factors such as the surface finish of compressor blades, for example, play a key role in increasing fuel efficiency.

As a result, OEMs and MROs are turning to advanced coatings that modify the surface of turbine components to improve wear and corrosion resistance, while also providing a lower coefficient of friction required for metal-on-metal contact of rotating parts such as shafts. One solution in this category that is garnering attention are physical vapor deposition (PVD) coatings for both IGT and steam turbine components.

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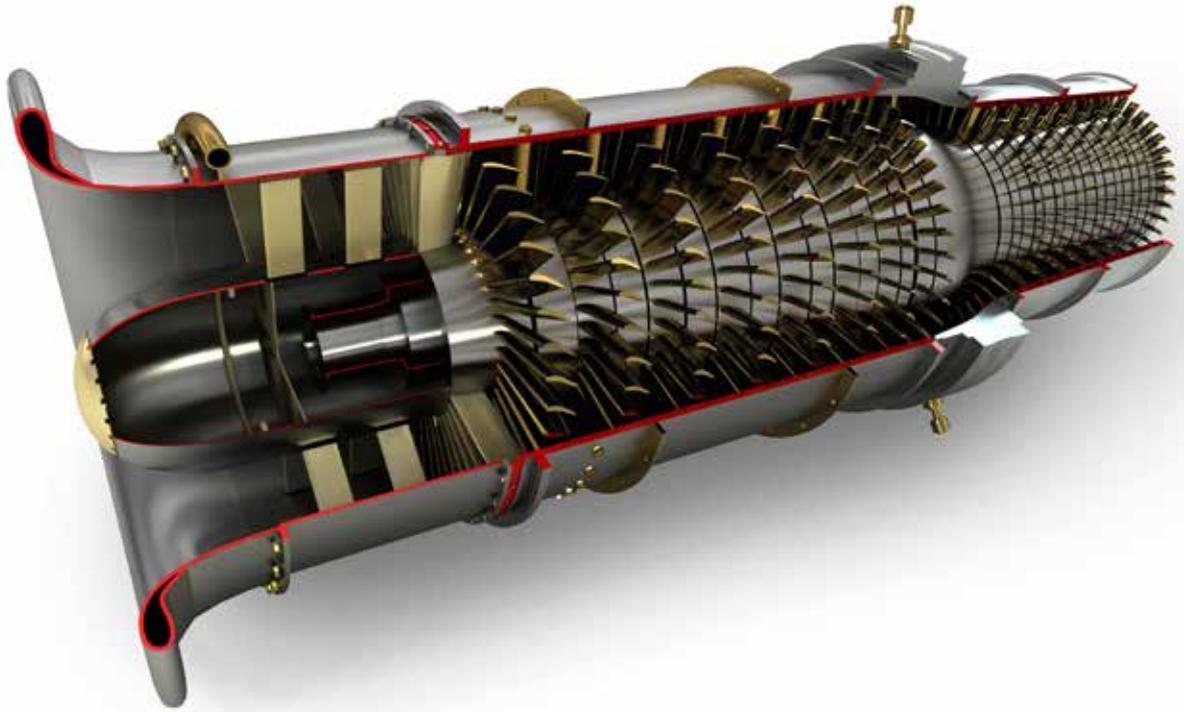
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“There is a high demand from OEMs and MROs for proven and cost-effective solutions that can extend the life of key turbine components that are operating in hotter and more demanding environments in order to reduce MRO costs,” says Paul Brooks, Lead Segment Manager of Power Generation at Oerlikon Balzers, a global OEM coatings provider to the industrial power generation industry.

*Protecting Turbine Compressor Sections from Erosion*  
Even today, the overriding goal of IGT OEMs continue to seek new ways to incrementally increase turbine efficiency. As a result, higher firing temperatures are often utilized, further increasing the temperatures inside turbines and leading to additional wear of component parts.

Erosion / corrosion & fouling of compressor blades, vanes and inlet guide vanes (IGVs) is a concern, given that the surface finish has a direct impact on optimum airflow and, therefore, engine efficiency. This can occur as a result of many factors, including tiny particulate or moisture droplets that make it past air inlet filtration systems

into the compressor section. An IGT located near a refinery, for example, can draw in polymers and sulfur from the air. Sand and salt are also common location-based issues.

Over time, the particulate sticks to the blades, creating a rougher surface that degrades turbine performance. As the blades foul, the efficiency of the entire compressor system eventually drops. This can drive up operating costs until the parts are serviced. Even then, parts that are re-polished to a mirror finish become quickly fouled again.

“Ensuring that surfaces of compressor blades are maintained smooth during service will maximize air flow through the compressor and sustain compressor efficiency,” says Brooks. “This is an area where PVD coatings excel because of their unique combination of extreme surface hardness and a low friction coefficient. PVD coatings have only been used marginally in gas turbines to date, largely because of limited awareness in this sector.”

Although the base material used to manufacture

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compressor section blades and vanes varies, and continues to evolve, most OEMs today utilize stainless steel, or apply a galvanic coating over a base steel. Unfortunately, galvanic coatings are relatively soft and erode over time. Due to the high cost of these components, solutions such as PVD coatings that are much harder and last longer are now considered a more ideal solution.

PVD represents a variety of vacuum deposition methods that can be used to produce very thin coatings, typically 1-5 µm in thickness. The thin coatings, in conjunction with close tolerancing, means that the component retains its form, fit and dimensions after coating without the need for re-machining. Thicker coatings up to 25µm can also be applied, if needed, to increase erosion resistance.

PVD coatings also provide a viable alternative in replacing hard chrome plating. This comes at an opportune time, given the industry's transition away from hard chromium plating to more environmentally friendly alternatives. For many years, hard chrome plating was the standard for achieving wear and corrosion protection, but due to European REACH regulations, the application of hard chrome plating is now highly regulated.

One REACH compliant PVD coating, BALINIT® Turbine Pro from Oerlikon Balzers, is specifically geared towards protecting engine compressor blades, vanes and integrated bladed rotors (blisks) from particle erosion by maintaining a highly polished surface finish to retain efficiency gains for the lifetime of the part.

The formulation delivers a metal aluminum nitride (MeAlN) structure that results in an optimal relation of high hardness to residual compressive stress even under high thermal conditions. The PVD coating can be applied to steels, super alloys and titanium components and has an extremely low surface roughness once applied.

The high hardness of BALINIT Turbine Pro has al-

ready been proven in solid particle, liquid droplet, liquid cavitation, waterjet and other erosion tests with the coating on various substrates (steel, Inconel and titanium) in different coating thickness and high temperatures.

In the solid particle erosion test in which materials were evaluated based on mass loss, for example, BALINIT Turbine Pro demonstrated more than five times higher erosion protection than other PVD coatings, including titanium nitride (TiN). That value increased to more than 40X when compared to uncoated titanium and even more for steel.

### *The Hot Section of Turbines*

PVD coatings also show promise for the hot turbine sections of IGTs. Thermal protection is a key MRO consideration for components in the hottest section of a gas turbine where temperatures can exceed 800 degrees centigrade. The intense heat, which can be increased based on the magnitude of the load, as well as the type of fuel used for combustion, can significantly reduce the life of combustion components.

Oerlikon Balzers is currently working with leading IGT OEMs on development of a PVD coatings that address both erosion and the corrosion that occurs in the hot sections of the turbine. Given the variety of metal substrates utilized for component parts and the variable demands in different sections of IGTs, the company regularly collaborates with OEMs to advance new coating formulations.

As a global coatings provider to the IGT industry, Oerlikon Balzers has facilities in 36 countries across 111 locations. "When there is a need to source or qualify a coating, it is an advantage to have a local supply chain & not have to send components to the other side of the world," says Brooks.

### *Steam Turbine Components*

Components of steam turbines also face high temperatures, erosion and fretting with the additional concern of steam-based corrosion. Steam



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turbines can operate on a standalone basis or in conjunction with gas turbines, as in the case of combined cycle power plants.

The primary concern when coating steam turbine blades and vanes is shortened life due to solid particle or water droplet erosion. As hot steam comes through to the high-pressure stage of the steam turbine, blades & vanes are subject to solid particle erosion. As the steam cools and turns to liquid in the low-pressure stages, water droplet erosion becomes the subject issue.

A companion solution, BALINIT D, was developed specifically for applications with high temperature steam to improve erosion and oxidation resistance.

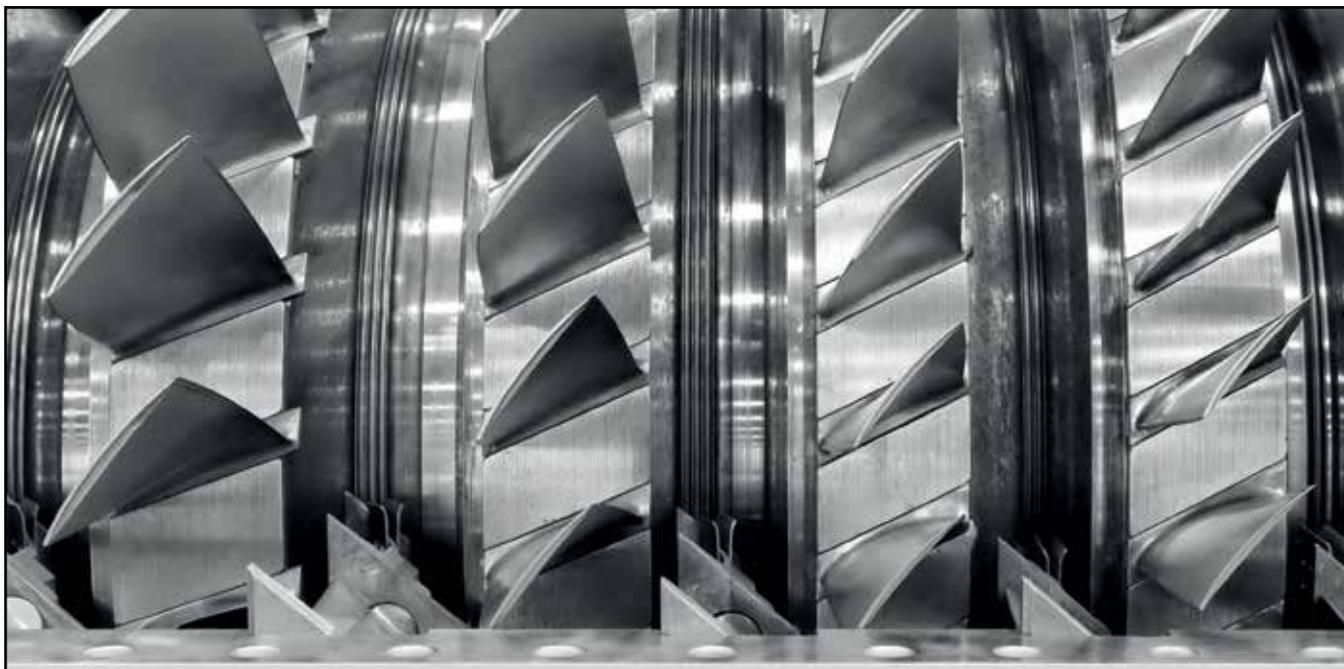
Because of its extreme hardness and superior wear properties, the PVD coating allows OEMs to substitute expensive alloys with less expensive stainless-steel or chrome steel substrates.

### *Efficiency Goes a Long Way*

Coatings play an important role in extending the life of critical gas and steam turbines while maintaining optimal operating efficiencies. Consider that just a single percent gain in efficiency for a 200-mega-watt gas turbine could represent the equivalent power needed for 1500 homes.

“Given the ever-increasing performance requirements of IGTs and steam turbines, there are more demands on the components,” says Brooks. “PVD coatings are an effective means to improve operational performance, reduce operational costs, extend operating hours and reduce maintenance intervals.”

For more information about PVD coating solutions for gas and steam turbines from Oerlikon Balzers, call (408) 375-4408, email [balzers.components@oerlikon.com](mailto:balzers.components@oerlikon.com); or visit [www.oerlikon.com/balzers](http://www.oerlikon.com/balzers) •





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## **SAVE TIME AND MONEY**

Engineered attachment points don't interfere with the functionality of the tools, and are more durable than simple "add-ons" that require frequent maintenance or replacement.

## **BEAT THE STATISTICS**

About 70% of drops happen during the exchange of the lanyard from one tool to another. The Snap-on Tools@Height system features independent tethering, which means each tool is attached to its own lanyard. Minimizing exchanges reduces the likelihood of drops and increases safety.

## **MINIMIZE RISK**

Independent tethering also allows the tool to be removed from and returned to its holster or pouch using just one hand. Safety is improved by allowing the user to maintain the critical "three points of contact" when working at height.

## **RETAIN CONTROL**

Our modular approach means you can configure the tools/holsters based on a user's personal preference, while providing a system that meets your safety standards.

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**John R. Tremblay** | Power Generation & Utility Market Manager  
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# DICA to Show New Cribbing and Pad Products at ICUEE 2019



DICA will debut a new addition to the ProStack Cribbing product line designed for the types of equipment used in the electrical utility industry. ProStack® interlocking cribbing blocks will be on display along with a variety of the company's Outrigger Pads and Crane Pads at the International Construction and Utility Equipment Expo (ICUEE), Oct. 1-3, 2019, in Louisville, KY.

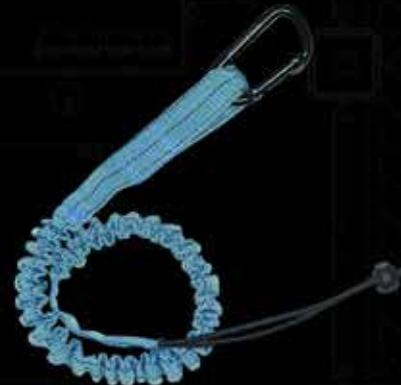
The new ProStack Cribbing product is a lighter weight and lower cost solution that was developed with customer input to meet the specific needs of this market. "DICA's new ProStack Cribbing product is a perfect fit for aerial devices, digger derricks and boom trucks," said Kris Koebg, CEO. "The combination of variable height, interlocking stackability and compability with SafetyTech Outrigger Pads gives utility line workers safety, stability, and versatility they need when working in unlevel environments."

Utility crews often need additional height under stabilizers and outriggers to level equipment during operations. ProStack Cribbing Blocks are an engineered, integrated solution that resolves this critical

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problem. The interlocking blocks can be stacked for additional height to create a safer set-up than traditional methods. ProStack Cribbing is made from a combination of post-consumer recycled and new materials to produce a strong and reliable finished product that interlocks into a SafetyTech Outrigger Pad.

SafetyTech® engineered thermoplastic outrigger pads deliver proven performance , durability and ease of use for setting up mobile cranes, concrete pumers, aerial lifts and digger derricks. Popular with utilities are DICA's Hi-Viz 18"x18" and 24"x24" SafetyTech Outrigger Pads due to their unbreakable strength, lightweight, and ease of use. In addition, specific setup needs can be met with DICA's Cavity Pad Plus, Cleated, Sliding Shoe, and Pole Puller Pads.

For situations that require greater outrigger pad rigidity and stability in a lighter weight solution, the company's FiberMax® fiber-reinforced polymer outrigger pads provide an engineered alternative to heavy steel plate or excessive matting materials.

For higher capacity cranes, FiberMax Crane Pads weigh 60% less than typical solutions and are designed for exceptional load distribution, stability, and cost effective operation. Unmatched ROI results from lower transportation costs, labor and handling costs, and their long life.

These, and other DICA products will be in use at many OEM equipment displays, including Terex, Altec, Dur-A-Lift, Elliott, Hiab, Manitowoc, Skylift, Spiradrill, and TIME/Versalift equipment.

Visit DICA at booth #3642 to receive an updated DICA Product Catalog, learn about new products, and try out the ITI VR Crane Simulator from Industrial Training International.

#### *About DICA*

*DICA is a family-owned and operated company that specializes in building high performance engineered outrigger pads, crane pads, and cribbing blocks that are lightweight, easy to use, and long-lasting. DICA products are proudly Made in the USA, ASME B30.5 compliant and used by operators in 40+ countries around the world.*



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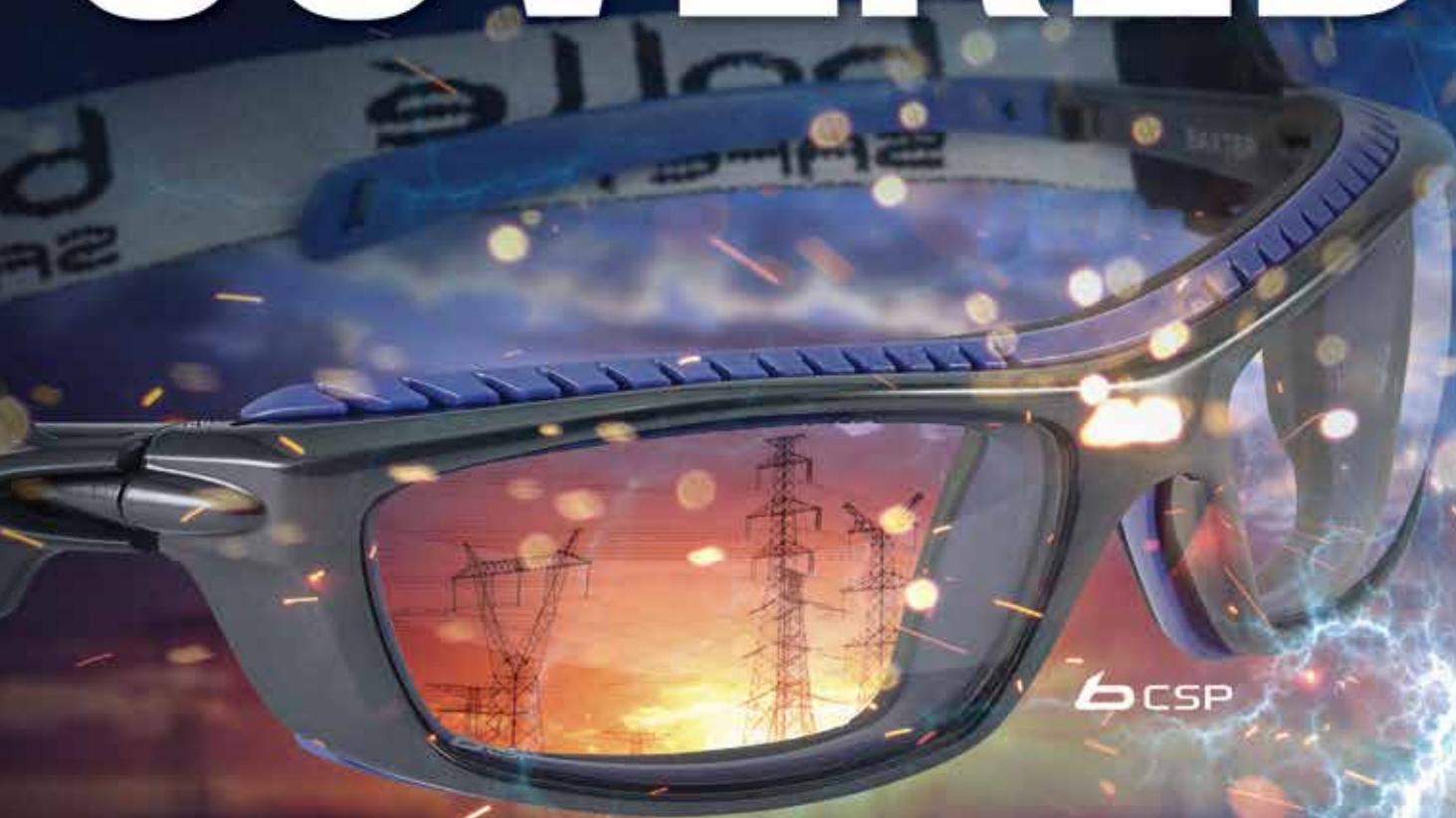
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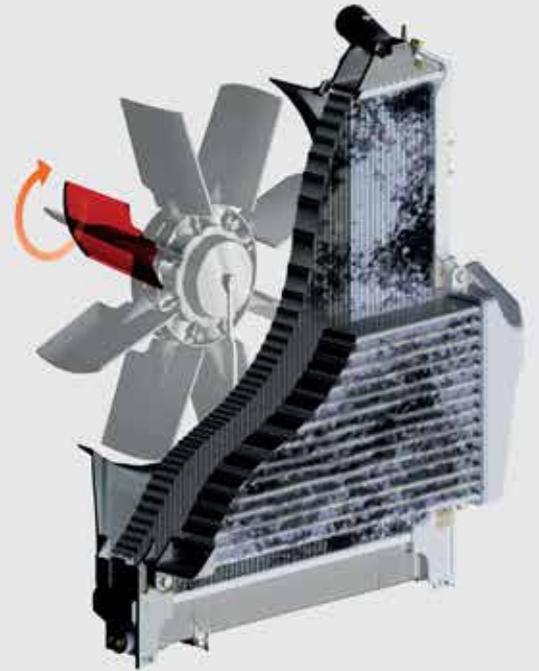
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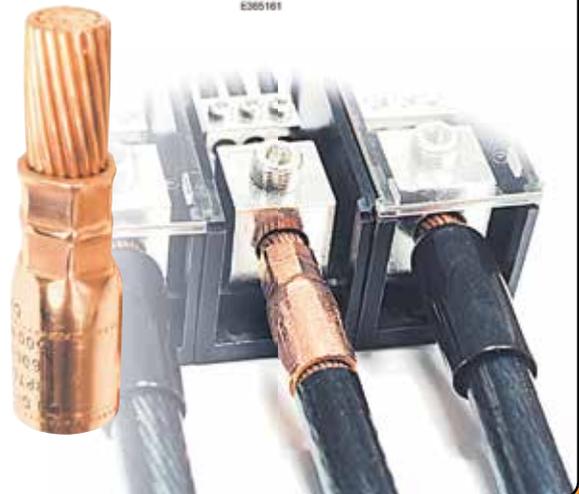
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