INDIUM CORPORATION

Materials Science Digest

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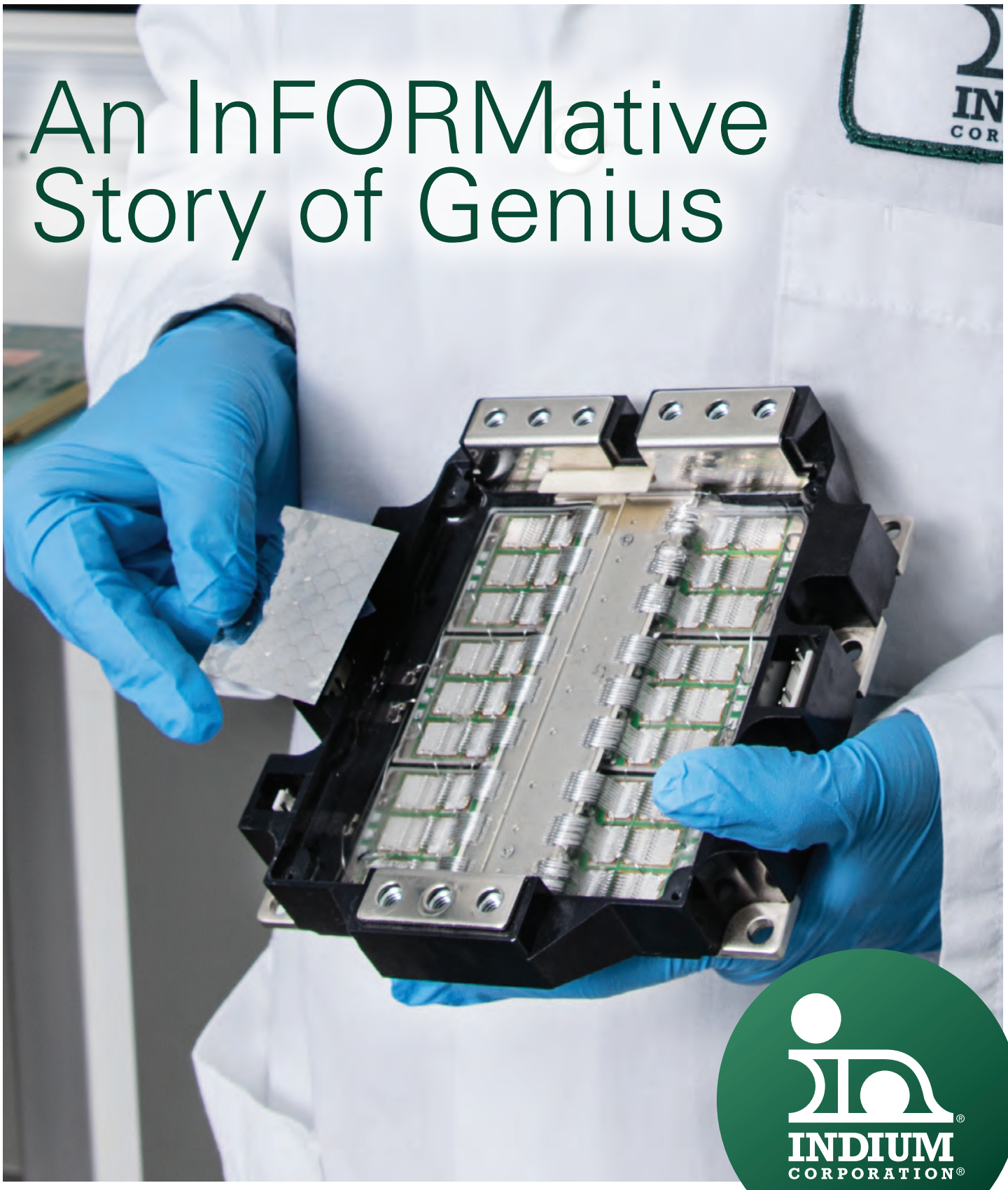
CHANGING THE WORLD



An InFORMative Story of Genius

INDIUM® CORPORATION®

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Materials Science Digest

Changing the World

Indium Corporation has always prided itself on the careful handling of proprietary information. Therefore, the names of customers, partners, and products have been changed in the following story to protect this valued, sensitive information.

Those of you who were close to the project will likely notice the subtle nods to company and technology names. However, if you're new to the team and would like to know more, simply reach out to one of the many colleagues who share their InFORMS® story in the pages that follow.

Regardless of the big names and brands, we hope your takeaway from this story is that **Materials Science Changes the world, and Indium Corporation is at the forefront of those changes.**

INDIUM CORPORATION®

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About the Writer

Elizabeth "Libby" Lemire grew up in New Hartford, New York. She graduated from Kenyon College in 1990 and then began working in the magazine business for *Condé Nast* Publications. Libby was the Creative Director at Vogue®, and later *Women's Sports and Fitness*, before moving back to her hometown to raise her three children. She loves meeting new people and hearing their stories, whether it be through fiction, a podcast, or a live-telling. Getting to know how Indium Corporation and its immensely talented employees are changing the world through materials science has been thrilling. Libby's downtime involves family, food, her dog Milo, sports, and daily Wordle and mini Crossword competitions, where she is always last on the leaderboard.

Foreword from the COO

Ross Berntson
President and
Chief Operating Officer

Welcome back! I'm excited to share with you the second edition of our Materials Science Digest: **An InFORMative Story of Genius.**

When you think of a genius idea, what comes to mind? No doubt some of the greats throughout history—Albert Einstein's theory of relativity and Marie Curie's work with isolating isotopes. Maybe you even think of recent innovations like Steve Jobs' personal computer revolution, or Elon Musk's contributions to electric vehicle design.

So, what makes an idea genius? Einstein himself once said, "Genius is 1% talent and 99% hard work." Similarly, Paul Cook (Founder and CEO of Raychem) believed that the winners in innovation are those who master the drudgery. In the pages that follow, I think you'll see that the genius of InFORMS® was really in the contributions, persistence, and hard work of many colleagues over more than 30 years.

The ***original thinking*** for InFORMS® began in 1989. But without Engineering's ***ingenuity*** to rethink materials; Sales' ***courage*** to tame the naysayers; Product Marketing's ***creativity*** to motivate teams; or Operations' ***drive*** to produce larger quantities, InFORMS® would not be the success it is today. I hope this inspires you to share your ideas, as everyone contributes at Indium Corporation.

As always, we know that the following stories can't possibly reflect everyone that was involved with the InFORMS® journey. Thank you all for the role you played and continue to play in Indium Corporation's success. I hope you are proud.

Stay tuned for more issues of the Materials Science Digest.

Do you have a story idea or would you like a copy of a previous Materials Science Digest?
Contact **ourstories@indium.com**.

– Paul Socha
Retired, Indium Corporation

An InFORMative Story of Genius

Indium Corporation launched its first edition of Materials Science Digest with the story of Durafuse® LT—our enormously successful technology in the hands of billions worldwide. This edition of MSD features a similar theme of technology reborn, but this story's sizzler is wild success, despite the boss saying: "Don't waste your time; it's not going to work." What type of team forges ahead? Read on.

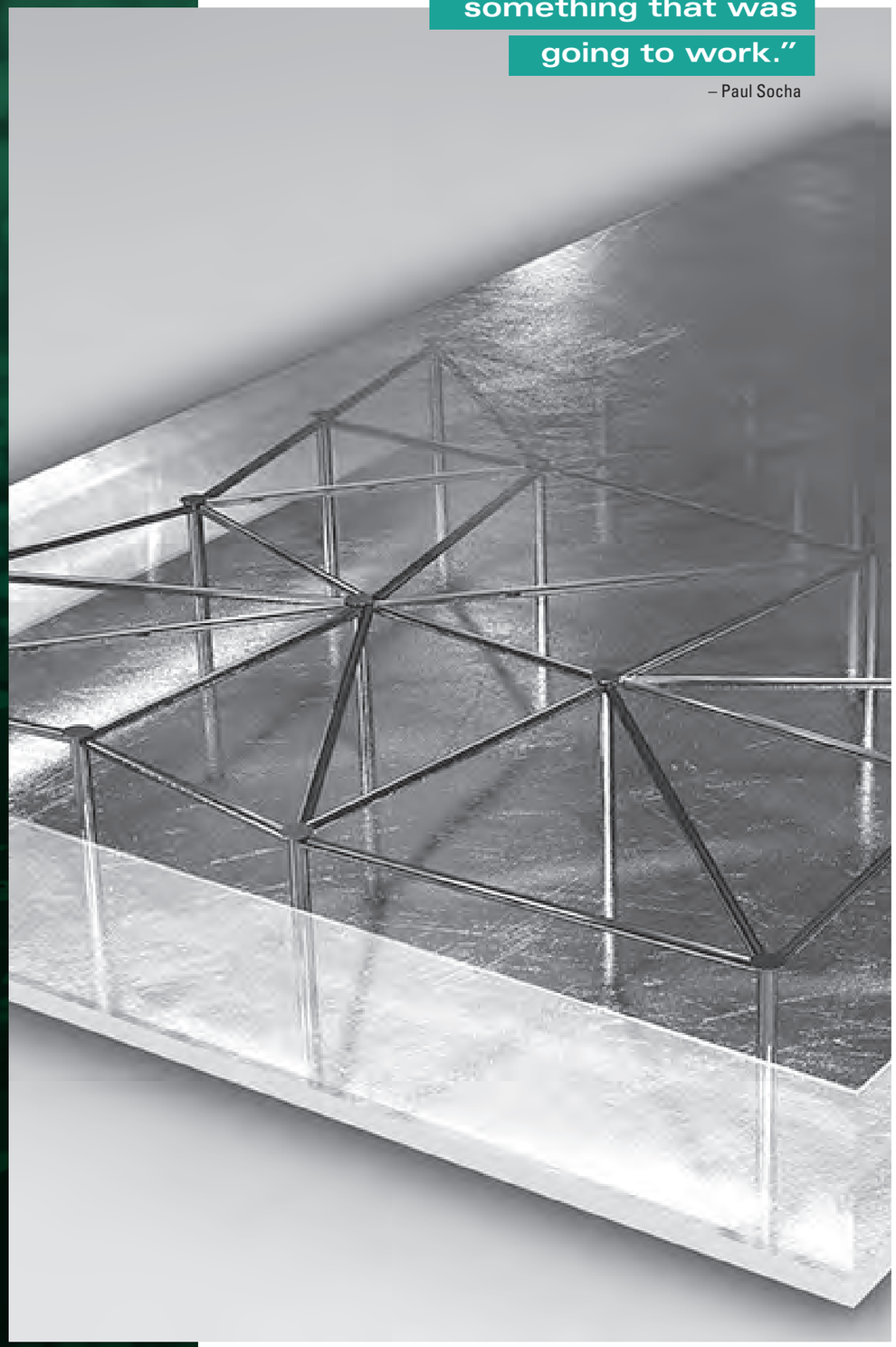
Original Thinking

The story begins with a survival radio for the military.

In 1988, Paul Socha began his Indium Corporation career fielding customer inquiries. Paul loved hearing what companies were producing, what engineers were thinking, and most importantly, satisfying their needs. If Indium Corporation did not have a product, he enjoyed the challenge of figuring out what could fit the application. In 1989, Paul picked up the phone and listened to a customer trying to solder disparate metals. Bull, Inc. was developing a survival radio for the military. They had two substrates they were trying to solder together that were a thermal mismatch, and joints were cracking. The circuit board needed to be impervious to the stresses of impact and/or fluctuating temperatures should a pilot crash. Bull, Inc. asked for suggestions, and Paul collaborated closely with them for months. "I was encouraged to pursue this, but also to keep my day job." Testing happened between the hours of 6–8 p.m. at Lincoln Ave. alongside Barb Ashline, who helped Paul tremendously, not the least of which was preserving Paul's fingers around the rolling mill. What motivated Paul to get up in the wee hours of the morning, run, get to Lincoln Ave. by 6 a.m., process, problem solve, and be at Indium Corporation's Ellinwood office by 8 a.m. to answer customer inquiries? "I just knew I had something that was going to work."

KEY

Bull, Inc.	Telecommunications Company
Butterfly Corp.	Electronic Component Manufacturer
Grasshopper, Ltd.	Consumer Electronics Manufacturer
Wolf Parts & Services	Italian Automotive Company
Fox, LLC.	Precision Parts Competitor
Mammoth, N.V.	Multinational Semiconductor Manufacturer
Kangaroo, Inc.	Multinational Electronic Car Manufacturer



"I just knew I had something that was going to work."

– Paul Socha

Utilizing a prop like the plastic netting used to protect wine bottles, **Paul described his key piece;** he mimicked the functionality, simulated thermal expansion, and demonstrated evenness and strength. It was sandwiched between two pieces of ribbon, did not melt, and functioned as a buffer to stressors that caused cracked joints, among other things. Paul experimented with Bull, Inc., until they finally got it right, but there was another hurdle—the material was pricey and Bull, Inc. balked. Jim Gill, Paul's boss, flew to Arizona, explained the labor intensiveness, and came back with the technology's first sale.

Paul named the technology InFORMS®, short for "reinforced preform." It seems impossible that 30 years had elapsed, as he rattled off Bull, Inc.'s preform combination and described in detail the material preparation orchestrated from his Ellinwood desk. "I remember materials stretching the length of the hallway; I would measure each and cut. My phone would ring, I would troubleshoot, and then prepare more." Each end was stapled to hold the assembly together, until Paul got a chance to feed it through the rolling mill with Barb Ashline's assistance. Once Paul's piece was embedded into the ribbon, the finished material was passed and punched, like a cookie cutter through dough. For as long as the Bull, Inc. business survived, Paul assembled and processed the InFORMS®. He tried desperately to find other applications, but with splintered time and management's concern for what was deemed an overpriced product, InFORMS® was shelved. Paul retired, thinking: **"It was ahead of its time."**

"It was quickly understood that it provided value..."

– Graham Wilson
Senior Applications Engineer

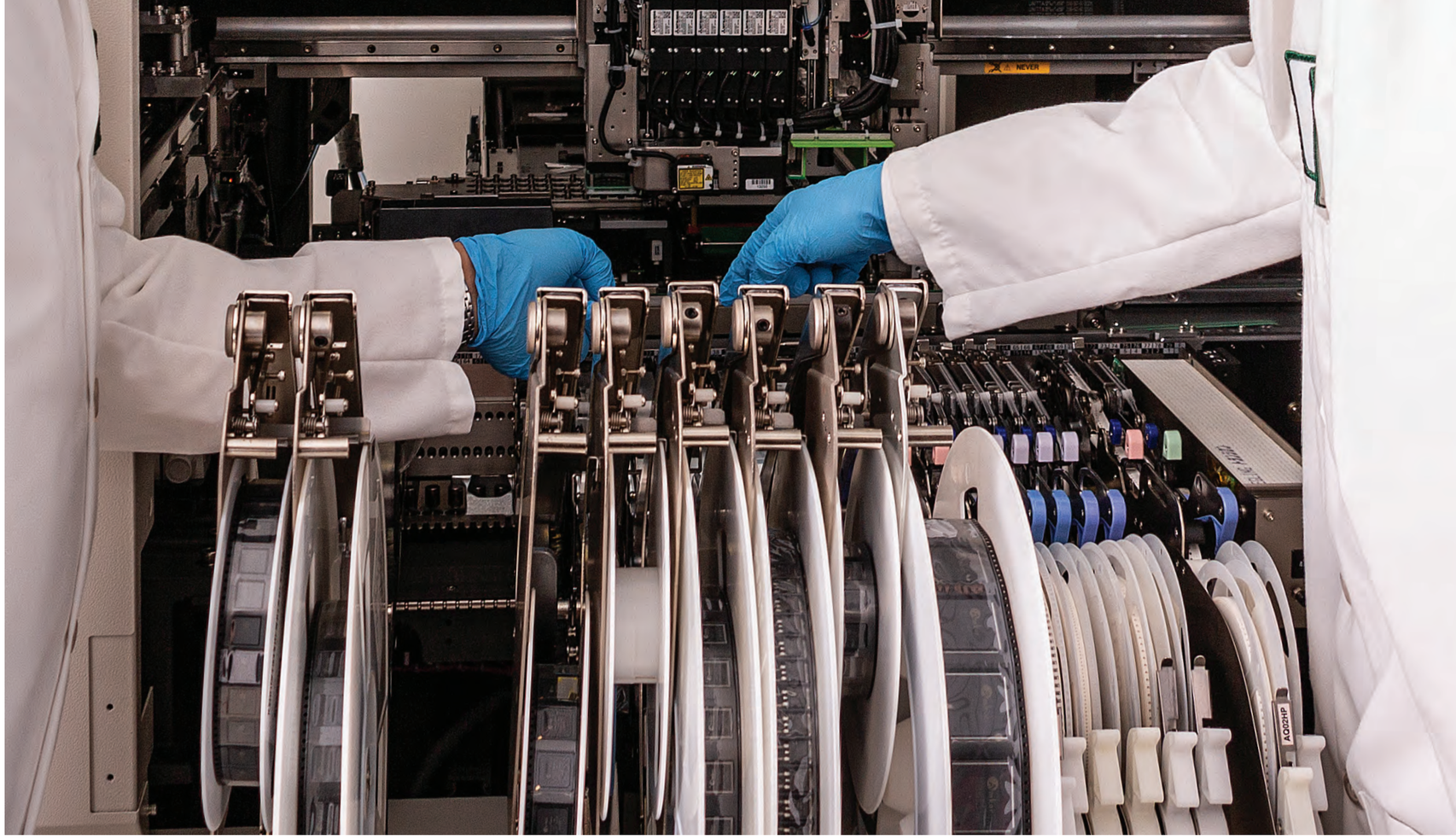
At this point in InFORMS®' history, there was prolonged dormancy, but also marked progress. Jordan Ross jetted off to Europe for three weeks to learn the power module market. He referred to this trip as the "Pants Tour," having left all the pants that he bought and specially pressed for the trip at home. Alan Fairbairn, with whom Jordan was meeting, grappled with the lapse, but the two quickly solved the pants problem and the true tour began. Jordan met with clients, became more fluent in power electronics, and became convinced that a multimillion-dollar market needed addressing.

Karthik Vijay and Graham Wilson had good relationships with two power electronic companies in the UK: Butterfly Corp. and Grasshopper, Ltd. Butterfly Corp.'s Aerospace Division needed to extend their thermal cycles, which according to Graham meant: "Taking a device from a minus to positive temperature a number of times, with both the solder and the device surviving, and the plane ultimately staying in the sky." Butterfly Corp.'s current solder solution achieved a certain number of cycles, but to exceed that number, they needed a reinforcement to increase and to maintain their solder thickness. Graham describes "this sort of brainwave" to use the InFORMS® technology and Butterfly Corp.'s willingness to try it. "They put it into their devices, took it through the thermal cycles and much like the Duracell, it kept on running." Despite only needing small quantities, Butterfly Corp. infused life into InFORMS®. Butterfly Corp. collaborated on a joint paper that was presented at worldwide technology forums and InFORMS® won a GLOBAL Technology Award for Best Product. "We used Butterfly Corp. as a bit of a petri dish to fathom out if InFORMS® had a place in the market. It was quickly understood that it provided value, but we did not have all the data we needed to take it to mass market," Graham explained. But then came along Grasshopper, Ltd. and a gigantic wave of innovation.

Grasshopper, Ltd. was outside the aerospace realm, in traction drive applications. Because the power electronics market requires superior soldering, Indium Corporation needed to look at new ways to improve the solderability of InFORMS®. When the UK team suggested soldering InFORMS® to Ross Berntson, he thought they were nuts, but allowed the experimentation to continue. After all, InFORMS®' original application was designed for a solid piece of compression. But the team believed it was worth a try, and **used their distance from HQ to clandestinely continue their efforts.** ■

Ingenuity

The team worked to identify something that allowed Paul's technology to bond with solder during reflow. Craig Merritt and Anthony Lanza sampled, and Grasshopper, Ltd. assessed, until there was a combination that they validated was indeed better. With a couple of proprietary changes never used in the making of InFORMS®, Paul Socha's creation was subjected to a new manufacturing procedure that paved the path to strong metallurgical bonds and stable assemblies. Coinciding with this huge discovery was vacuum soldering, a technique primarily used in Europe that pulled voids from molten solder. Like Butterfly Corp., Grasshopper, Ltd. collaborated on a joint paper with Indium Corporation. "The Embedded Mesh Technique for Increased Reliability Between Substrate and Baseplate in IGBT Models" was presented at a seminar in France and then later at the PCIM seminar in Nuremburg, Germany. According to Graham, "Once we got tangible reports that InFORMS® was a valuable product, we knew it was no fluke and we pressed forward."



Further evolution of InFORMS® came by way of a company selling materials for making pizza. Jordan Ross found a screen-like material at a trade show and thought it might help him automate a flux-coating process unrelated to InFORMS®. When the salesperson called on Jordan, he remembered opening the brochure, seeing the high-temperature metal mesh and his mind had a "bing, bing, bing" moment. He thought: "If we can get this in roll form, we can put this in solder, and we can make an InFORM." **Jordan described it like "Match.com for material suppliers."** The company was small and wanted to work with Indium Corporation, their material was technical and offered variety, **but the biggest discovery was that the material came on a roll.**

Soon it was determined that InFORMS®' key component warranted a cooler name. The finalist deemed too revealing to disclose, will be given the alias: "geometric" from now until the story's end. Despite the technology's new, cool name, there was still a lingering issue of executive support. Ross was intrigued by the coupling of Indium Corporation's secret sauce and vacuum soldering, but where was the revenue? According to Tim Jensen, Indium Corporation dabbled around in the power electronic space for the next 4–5 years, but "we could never drive the value proposition for people to implement InFORMS®." Undeterred, Graham and Karthik forged ahead and unleashed the next version of InFORMS® to mass market. The news of its potential spread. The facts are a bit scant of how and when Wolf Parts & Services learned of InFORMS®. But despite missing that detail, the most significant development in the story was Indium Corporation's catapult into an emerging market: electronic vehicles (EV). Wolf Parts & Services had functionality issues with their start-stop module (the MGU) and needed instant fixes. The engine's repeated on/off was fatiguing the solder, making it fail, stopping the car, and creating a new market for tow trucks. Wolf Parts & Services was supplying other OEMs and they needed to deliver. Wolf Parts & Services believed in the InFORMS®' ability to control bondline thickness, but Indium Corporation had to prove they could ramp up and adhere to Wolf Parts & Services' strict requirements. The automotive business had specific ways of doing things, and Indium Corporation had a steep learning curve and a condensed timeline. InFORMS® had an early test with the automotive industry's Production Part Approval Process, devised to ensure a supplier's design and production process meets automotive requirements and minimizes risk of failure. InFORMS®' final stats won over the heart of Wolf Parts & Services. Now, the challenge was to make what they sold in volume. Wolf Parts & Services was Indium Corporation's first InFORMS® customer asking for mass production. They went from wanting thousands of units to tens of thousands. According to Brandon Judd, who had recently switched roles to become a Manufacturing Engineer at BPD, Indium Corporation was just getting started in this automotive arena: "It was a loud wakeup call with lots of room for improvement in terms of scaling for manufacture and settling processes—**we needed a lot more rigor in the factory to make it repeatable."** ■

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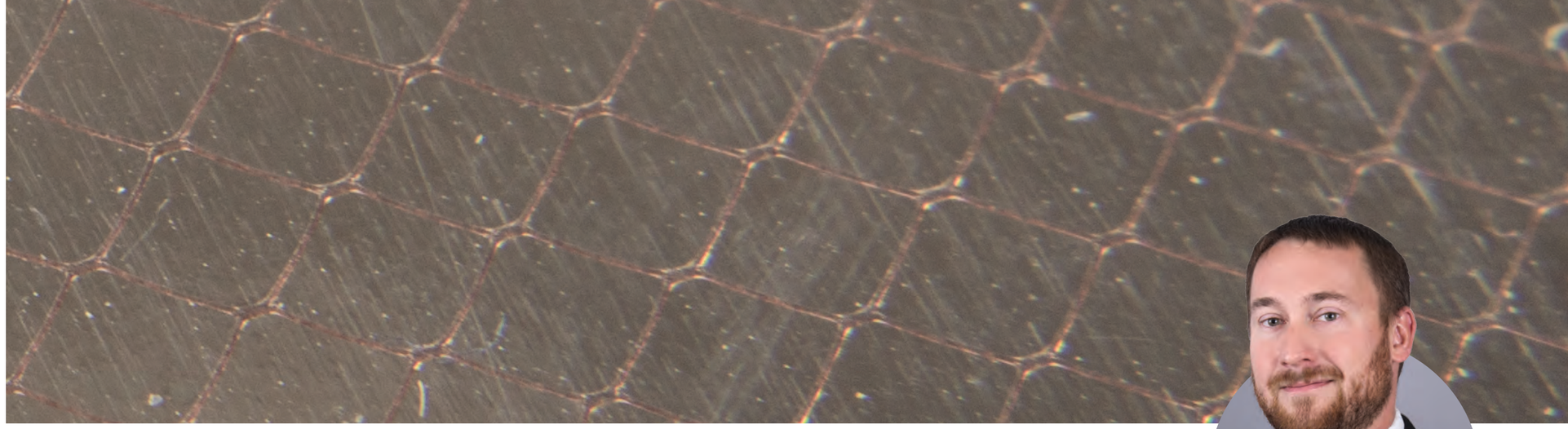


Creativity

One of the first big lessons for Indium Corporation was that one size does not fit all applications in power electronics. As the team got more familiar with the EV application, they learned about "tiers of assembly" and realized they needed to offer the InFORM in assorted configurations. In testing for Wolf Parts & Services, Indium Corporation discovered a delicate balance between the geometric density (i.e., smaller = denser) and soldering performance (voiding). However, regardless of size alteration, InFORMS® delivered consistency, strength, and reliability. It was a key innovation that led to the development of guidelines for customers selecting geometric sizes for their specific assembly (substrate to baseplate, die-attach to substrate, and top-side die to lead frame) and a catalogue of logical names to choose from: LG = large geometric, XLG = extra-large geometric, SG = small geometric, ESG = extra small geometric. Wolf Parts & Services settled on LG.

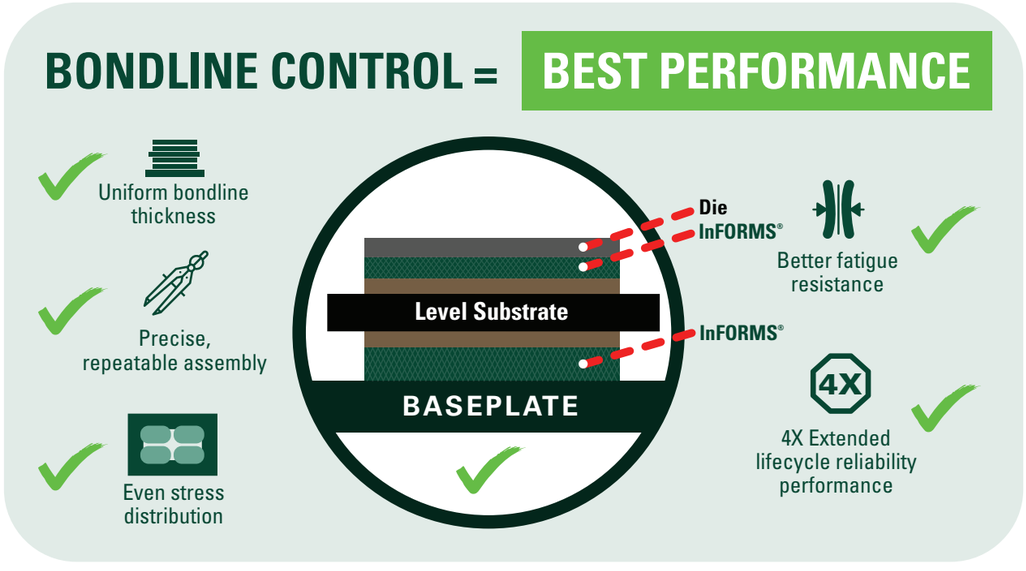
Production needed a direct melding of the materials, quickly and consistently. **As volume ramped up, so did issues with alignment.** Brandon winced slightly when reliving some of the challenges, but he moved swiftly to the cohesiveness of the team and their tireless efforts to find a solution. Designed and sourced by Mark Reese, a small customization was implemented on the rolling mill and all was right in the world of meshing materials, but all was not well with packaging. Wolf Parts & Services wanted the InFORMS® to be oriented a certain way to create efficiency in their own production line. **It was a manual, time-consuming process of either geometric up or geometric down. "We learned as we went, and then figured how to plan."** Fortuitous lessons given what was coming.

The Wolf Parts & Services business coincided with an internal summit, involving Indium Corporation's technical and sales teams. Graham Wilson and Brandon Judd got creative with their PowerPoint entitled: InFORMS® Strike Back: The Bondline Wars. It cleverly weaves references to the classic opening credits of Star Wars: "Peace is no more – War is raging in the Automotive Power Module Sector – Ever growing reliability requirements mean that Darth Wirebond's reign is over – Armed with the vastly superior Homer-Solo and the Engineered Solder Alliance – Indium Corporation stands united to end the reign of Darth Wirebond – Advance the InFORMS® design and win within the Automotive Power Module Sector." There are blatant metaphors and subliminal messaging throughout the presentation…**but suffice to say Ross Berntson felt "The Force" of InFORMS®.**

Wolf Parts & Services required a lot of fine tuning, but once Indium Corporation got the kinks worked out, "the monster was truly born," remarked Graham Wilson. Wolf Parts & Services was without a doubt a turning point in InFORMS®' next iteration and a stepping stone to other automotive circles. Indium Corporation was armed with firsthand, automotive experience; **their factory had been successfully scaled for automotive manufacturing,** and large volumes of Wolf Parts & Services products were moving through Indium Corporation's BPD facility. Indium Corporation seemed nicely teed up for its next colossal prospect. ■

"We learned as we went, and then figured how to plan."

– Brandon Judd
Assistant Manager–Engineering



Drive

This next phase of the saga is long and arduous, but the Indium Corporation team maintained a strong will to win.

After a brief sabbatical from Indium Corporation, Seth Homer returned with a primary objective to drive adoption of InFORMS®. Indium's South China team had visited Mammoth, N.V. in Shenzhen and forecasted big business potential for InFORMS®. Indium Corporation initiated talks with Mammoth, N.V. (Italy), R&D headquarters for Mammoth, N.V.'s power modules. Seth and the South China team sent samples to Catania and Shenzhen to assess interest. At the time, Indium Corporation's competition was qualified first supplier and produced large volumes for Mammoth, N.V. Fox, LLC. had the same bondline guarantee as Indium Corporation's, but whatever your level of understanding, reader, know that **the competition's single point bondline design delivered worse performance, and the team began their journey to prove it.**

InFORMS® has been Matthieu Samain's focus since his first day with Indium Corporation in November 2017. He managed the competition with steady persistence. "We were on weekly technical support calls, discussing issues Mammoth, N.V. had with Fox, LLC. products, attempting to explain what was happening, and what could be improved with InFORMS®. We needed to grow a relationship with the customer, instill confidence, and provide technical support, even when we were not discussing our product. Every call I reiterated that the Indium Corporation alternative was better and pushed to qualify us as a second supplier."

After one year, InFORMS® was verified and moved to Mammoth, N.V. Shenzhen with steady work to be done toward formal qualification. David Hu began working with InFORMS® somewhere between this qualification phase and mass production. "We were not qualified yet and we were still working in small quantities (10K–20K). And by the time InFORMS® finished the qualification phase, Mammoth, N.V. had changed their design.

This next phase of the saga is long and arduous, but the **Indium Corporation team maintained a strong will to win.** Seth describes a couple of years where they were continually iterating design; "we had to go a little smaller, a little thicker, smaller again, maybe a little thinner…" Indium Corporation was delivering a lower yield than Fox, LLC., and they had to figure out why. Indium Corporation improved their process yield, but it was hard to quantify and lacked context. Mammoth, N.V. was not sharing the data that showed the differentiation of performance along the way. But after lots and lots of tests, Indium Corporation discovered that changing the size of InFORMS® helped their yield. Because the formal qualification process in automotive takes a long time, Indium Corporation convinced Mammoth, N.V. to do a product change instead, and they agreed. Mammoth, N.V. did a "stringent test" on 20,000 modules with the new size, **and the InFORMS® performed**. ■

– Matthieu Samain
Latin Regional Sales Manager

Excellence

It is worth asking for a retelling of "the call" if only to witness Seth Homer relive it. The days, nights, and weekends spent fostering relationships brought to bear trust and intel that revealed just how many parts were at stake. Seth and his son Brody were Lake Placid-bound by way of the New York State Thruway—a straight road chosen out of consideration for their dog's travel-weary stomach, but proved additionally wise for phone reception. When the Mammoth, N.V. call came in, Seth said to his then 16-year-old son: "I gotta call, and you gotta drive." How they switched seats quickly enough to not miss a word of **"Kangaroo, Inc.'s CEO knows about InFORMS® and he wants it in his module" ...** Seth may never be able to explain. As memorable as it was to hear that Kangaroo, Inc.'s CEO was resolute in his decision to use InFORMS®, also memorable were the words, "Man, you're smart" from Seth's teenage son after he hung up the phone.

Joe Hertline talked about having Kangaroo, Inc. tell Mammoth, N.V. to use our material, as though he was still trying to process the achievement: "Hey, this is a superior product that is going to increase reliability. I want you—Mammoth, N.V.—to put InFORMS® into your product that you sell to me. It is an interesting dynamic. Kangaroo, Inc. recognized the benefit, and they pushed their supplier to make sure that they had the technology." At this point, it is safe to say that management was fully behind InFORMS® and a champion of all who evolved InFORMS® to the brink of extraordinary opportunity. ■

– Joe Hertline
Product Manager–
Engineered Solder Materials
and Power Electronics

Courage

It was time to prove that Indium Corporation had the competence to produce volume. Jordan Ross asked Seth Homer whether Indium Corporation could win if they told Mammoth, N.V. they have a million parts in stock. Seth asked, "Can we do it?" Jordan said, "Of course we can do it. Plus, we need to find out if we really can do it." Although Indium Corporation had the Wolf Parts & Services experience, the task was not a thousand, not ten thousand, not a hundred thousand…it was a million. Mammoth, N.V. visited BPD and they disclosed information that turned the contemplation of producing a million parts into the decision to move forward. Seth said: "We had to convince them we are nimble and we can add capacity. We had to ramp up and that's where all the effort was."

Seth booked the conference center and everybody necessary to make one million parts was there. They walked through every detail of what the production process would look like. What did Indium Corporation need to pull this off? What equipment? How much? The meeting sparked a profound realization that this business was within Indium Corporation's grasp. According to Ross Berntson, "We made the right decision to plan for success, not failure." And there was a rallying cry for 1kk, and the BPD team led the charge.

"The Roo Campaign" inside the walls of Business Park Drive was Indium Corporation's first CFT (Customer Focus Team). Jordan abbreviated Mammoth, N.V.'s code for the customer (kangaroo) and made Indium Corporation's code word: "Roo." There were Roo t-shirts for dedicated employees; Roo stickers for dedicated equipment; and color-coded teams responsible for standing status updates. There was a level of engagement that revved people to lean in to a first-place finish. "Everything had to do with the people," reflected Jordan Ross. One team member happily recounts the Roo Campaign: "We had never been introduced to a product line like that. It was exciting all around. As we progressed through the process, there were a lot of eyes on us and people were like, 'these are the guys that are making this happen.'"

Jordan Ross and others collectively agreed that "until you stress yourself to the point of a million parts, you don't realize what can go wrong." The road was bumpy. Even though they had learned from producing small quantities for Mammoth, N.V., production at this volume lead to more crucial discovery. They had to stabilize the manufacturing process and eliminate any variation to the delicate material. They had efficiencies to work out pertaining to cost and profitability.

– Jordan Ross
Senior Manager–Manufacturing Operations

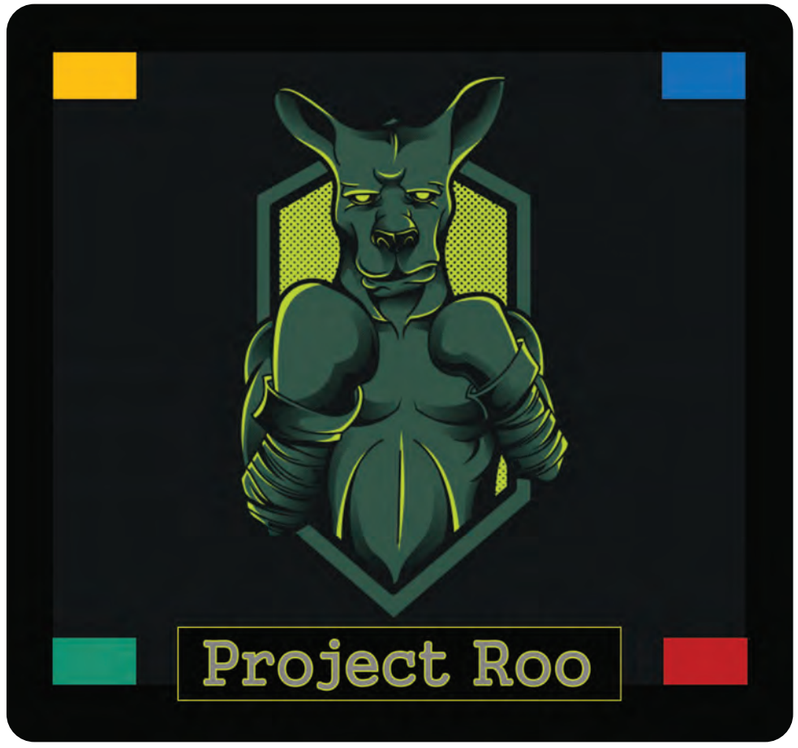
"We had to convince them we are nimble and we can add capacity. We had to ramp up and that's where all the effort was."

– Seth Homer
Global Accounts Manager–Engineered Solders

There were third party suppliers who never delivered. There were supply chain issues related to the procurement of packaging. Jordan knew there were going to be horrendous problems along the way, but the mantra to Team Roo was, "It's not a failure until you give up." Sage advice given the next mistake.

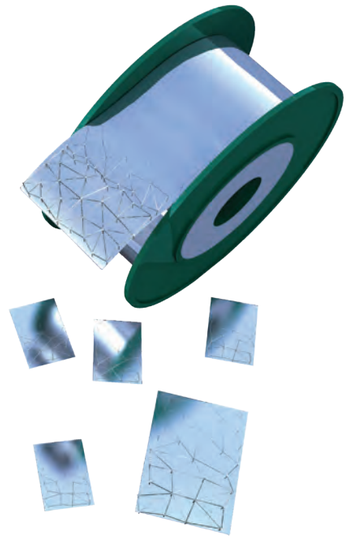
Indium Corporation made the parts, but there was one more pain point before the finish. They did not do the final quality check on the inventory material until the order was in. When they went to do the final packaging, Indium Corporation realized part dimensions were out of spec, and some parts were oriented incorrectly. They had not followed the client's specifications and were forced to scrap millions of parts.

When asked if there was ever a time when he felt like Indium Corporation was going to fail? Without a moment's hesitation, Seth says: "Absolutely. Fox, LLC. was already selling millions and millions of parts and had the ability to start dropping their price when they noticed we were a threat. We were still working on the right relationships; it was touch and go." **But with InFORMS® delivering five times the survivability rate after thermal cycling, the client hung in.** ■



Setting Standards

When Joe Hertline came onboard, InFORMS® had a good, stable manufacturing process, market share with Mammoth, N.V. was about 25 percent, and Indium Corporation was actively trying to convince Mammoth, N.V. that they should allocate a larger share of their production to InFORMS®. "The customer was trying to accelerate their production to 40,000 modules per day. We had to figure out how to make our product fit into their assembly quickly, consistently, and without defects. We found that by using an integrated process, it was difficult to achieve efficiency and mitigate defects when scaling up, and there was tremendous waste of expensive materials." By decoupling part formation from packaging, Indium Corporation maintained better process control and leveraged real-time inspection technology to avoid defects. Indium Corporation's yield numbers increased, their defects went down, and InFORMS® "dropped in" to Mammoth, N.V.'s production line.



Tape & Reel is a packaging method consisting of a carrier tape with pockets to hold individual solder preforms, enabling automated, high-volume manufacturing.

Matt Samain focused on the Moroccan facility, getting to know all the people involved, always working to guarantee volumes go to Indium Corporation.

Indium Corporation succeeded with all their production hurdles and were qualified as the second source for the Gen 2 Mosfet, but Fox, LLC. still had market share, and who wants to be second when you know you can be first—which is exactly why the Indium Corporation team kept plugging. **"I'm fortunate in my team,"** said Andy Seager, European Sales Manager. **"Everybody is a hunter and a farmer—great at winning the business and great at nurturing the business once it has been won.** That is why we are so successful with Mammoth, N.V.; we have created a situation where we have respect from the customer, and they trust us."

In 2019/2020, Mammoth, N.V. decided to split production because their customer was ordering so many parts, and there were issues getting materials out of China. They copied and pasted production lines from their Shenzhen facility and added new lines to their Moroccan facility. As the pandemic afflicted the world, Mammoth, N.V. navigated COVID-19 disruptions more rigorously than most. Matt Samain focused on the Moroccan facility, getting to know all the people involved, **always working to guarantee volumes go to Indium Corporation**. Seth Homer went to Morocco with the South China team to make inroads, as well. And his quick side note: other than his rental car being checked for bombs, and contracting a "mystery virus," the food was fabulous, and he urges others to go if given the chance.

Step by step, Indium Corporation went from about 30 percent share of the Gen 2 T-pack business to 100 percent share of the Gen 3 T-pack business. And even though this story's focus is on that success, the breadth and depth of InFORMS®' future is mind-blowing: Mammoth, N.V. Pack/EV, charging stations, windmills, solar generators, bus and train traction drives…and all the evolving technology that is, well, still evolving. David Hu received a call from an e-plane company, asking about InFORMS®. And he is "very confidently showing them Indium Corporation's total solution."

Seth Homer says there were two main factors in capturing the glory, but by the time he is finished, it is more than two. He begins by saying: "We have an extraordinarily strong tactical group. We hire the right people who are smart and have great technical abilities and fantastic process knowledge. Our clients know they are working with somebody that knows what they are talking about." And as for his number two: **"Indium Corporation has a brilliant sales force. We generate relationships and then we are entrenched with them."** And he squeezes in a third, which is more like a sixth: "And then, you know, it does not hurt to have an amazing product."

InFORMS® lived a moderate life of ups and downs until a seismic shift, not unlike the horse to the Model T, enabled Indium Corporation and its differentiated product to capture the attention of the power electronics industry. With downright doggedness, Indium Corporation resurrected and developed a technology, infiltrated a market, gained expertise, and rallied as one. It is a snowballing achievement. Indium Corporation is positioned for momentous growth, and the power electronics sector is knocking on Indium Corporation's door… genius. ■

Epilogue

When we wrapped our story, Indium Corporation was positioned for momentous growth, with the power sector knocking. Well, the knocks got loud and the volumes got big, in a short amount of time. Anthony Piccione described a feeling of: "Wow, is this real? Is this really real?" We'd be remiss to exclude the details…

– Anthony Piccione
Assistant Plant Manager & VFT Manager

- Exponential growth warranted a dedicated division with its own identity. Meet PowerCFT located at BPD, managed by Anthony Piccione. VFCP was relocated to Rome to make room for the new Customer Focus Team; and next level expansion will include one-third of a new Malaysian facility, also centered around power manufacturing.
- In 2021/2022, Indium Corporation purchased and installed six manufacturing machines to accommodate the initial capacity expansion. There are four more machines in the works for BPD.
- In 2022, the power area was 25 people; by the end of 2023, there will be 105 people, at least 90 of whom will work primarily with InFORMS®.
- In September of 2022, Indium Corporation was making two million parts for Mammoth, N.V.; the first quarter of 2023, Indium Corporation made five million parts; by the end of 2023, Indium Corporation will be making eight million parts—for one customer.
- Indium Corporation's success with the "Roo" ramp had a ripple effect on their "Nautilus" business. The business will be ten times what it once was.
- Outside the one massive InFORMS® customer, Indium Corporation is in full production with other steady InFORMS® customers. They are purchasing InFORMS® in various shapes and sizes and that market continues to grow. Current customers are expanding their options to see if they can replace current product with an InFORMS® to increase reliability. The forecast is for the business to quadruple.
- 2022 was InFORMS®' largest revenue year. 2023 will be five times that number.

Someday there may need to be an InFORMS® sequel. Anthony wraps the InFORMS® discussion with: "We're not done—we are nowhere near done—we're really just getting started when it comes to this division of the company." Given Kangaroo's goal of 20 million cars a year (double what Toyota produces), buckle up, Indium Corporation, you're in for a fast ride.

INDIUM® CORPORATION®

TheIndiumWay.
respect. appreciation. achievement.