the official magazine of Composites Australia

Connection Magazine

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Publisher:
Kerryn Caulfield
Executive Director

Editorial inquiries:
kerryn@compositesaustralia.com.au

Design:
Stefan Morris
smasheddesigns.com.au

Kerryn Caulfield
Composites Australia Inc.
0412 556 698
kerryn@compositesaustralia.com.au
compositesaustralia.com.au

President's Letter

LinkedIn: compositesaustralia
Facebook: compositesaustralia
Twitter: @CompositesOz

Lynden Vikingur, **President**

It is a pleasure to introduce this edition of Connection, which examines the internationalisation of Australia's composites industry and features a selection of companies that have established their position in global markets.

For many in our sector, international engagement is not new. It reflects the realities of operating in a domestic market smaller than the one we serve. Our family company, Vikal International, has been exporting marine craft, particularly superyacht tenders, for over 33 years. This has meant that 80 per cent of our work during that period was destined for export—vessels designed and manufactured in Australia to international standards, regulations and scrutiny.

In marine, vessels are built to class, not geography. Classification societies such as DNV define requirements for structure, materials, systems and safety. Where early contracts were brief, today they are detailed technical documents that feature strict compliance, traceability and verifications clauses. These manufacturing benchmarks shape material selection, structural engineering and quality assurance. Certification is not an endpoint but a condition of participation, providing assurance to insurers, owners and flag states that vessels are fit for purpose. For manufacturers, it requires disciplined design, controlled processes and alignment with ISO standards and class rules.

Beyond marine, Australian composite manufacturers, engineers and designers operate across aerospace, infrastructure, energy and defence programs governed by international standards, certification regimes and procurement systems. Competing in these markets requires more than technical skill; it demands sustained alignment with global requirements.

This edition includes Boeing Aerostructures Australia, CST Optimum, Riviera Australia, Talon Technology, Wagners Composite Fibre Technologies, and pool manufacturers Compass Pools and Aquatic Leisure Technologies, as well as an article from Tony Caristo, Managing Director of RPC Technologies—companies operating in markets larger than Australia.

Australian companies are building this presence through export, partnerships and in-market manufacturing, while retaining design, engineering and process development domestically.

The following articles show Australian composites competing internationally. What emerges is a sector outward-looking by necessity, building capability recognised globally.

Warm regards,
Lynden Vikingur
President, Composites Australia Inc.

Composites Australia

VIEWPOINT

Internationalising Australian Composites: **From Export to Embedded Capability**

Written by Tony Caristo, Managing Director at RPC Technologies

Working in composites in Australia once began with explaining the material before discussing its capabilities. In the 1970s and 80s, we were competing with steel and concrete in markets that had little reason to change. The early work was not about scale or export. It was about proving that glass-reinforced plastics could survive in corrosive environments, carry load and deliver a service life that conventional materials struggled to match.

That phase mattered. It established technical credibility in sectors where failure is not tolerated—water, wastewater, mining and process industries. It also set the foundation for something that has become more apparent over time: composites are not just an alternative material; they change how things are designed, manufactured and installed.

Early exposure to international work occurred almost by accident. In the early 1990s, a project in Singapore required a manufacturing solution that did not exist locally. The answer was not to export product from Australia, but to establish capability closer to the project. That led to the setup of a plant in Batam, Indonesia—initially temporary, later permanent.

Looking back, that decision was driven by the need to understand how to operate across jurisdictions. It required adapting to different labour markets, supply chains, regulatory environments and customer expectations. It also showed that Australian engineering could be transferred and applied offshore, provided the systems and people were in place.

That experience shaped our approach to internationalisation. It is not a single step from domestic to export. It is a progression—from supplying offshore projects, to establishing a local presence, to integrating operations, capabilities and skills across multiple regions.

RPC has since progressed from a business that once operated primarily in Australia to one that now works across multiple countries, with manufacturing facilities in Australia, Southeast Asia and India, and projects delivered across the transport, infrastructure, asset services and defence sectors.

Tony Caristo

SEVERAL PROJECTS ILLUSTRATE HOW THIS HAS EVOLVED.

In Singapore, the transition to complex international work began with early odour-control systems for wastewater treatment plants. These projects required not just fabrication, but full design, manufacture and installation capability. This work set a benchmark for the application of composite systems in urban infrastructure, where corrosion resistance and durability are essential.

In Indonesia, the Batam facility became a production base not only for regional projects but also for a broader supply network. It demonstrated that offshore manufacturing could be integrated

In-situ assembly and bonding of large fibre-reinforced polymer (FRP) pipe sections within an underground chamber on Auckland's Central Interceptor project.

For Alstom India - REM Driver cab and carriage with GRP front end, interiors and exteriors.

with Australian engineering without compromising quality.

Building on these experiences, more recently in New Zealand, the Central Interceptor project in Auckland required the design and installation of large-diameter GRP cascade shafts—up to 7.5 metres in diameter and 70 metres deep. It was not a conventional project. It required coordination across multiple RPC facilities in Australia and offshore and disciplines, with engineering, manufacturing and site teams working as a single system.

Now, in India, establishing manufacturing capability represents a new and unique phase in the progression. Unlike Batam, this effort is not project-driven. It is about positioning within a market, specifically Transport, that is growing, technically demanding and increasingly integrated into global supply chains.

Across these projects, a consistent theme emerges. International work is not just about exporting a product. It is about transferring capability—design, process control, quality systems—and adapting them to local conditions.

THE BROADER COMPOSITES INDUSTRY IN AUSTRALIA HAS FOLLOWED A SIMILAR PATH.

In the early years, the focus was domestic substitution—replacing traditional materials in local projects. Over time, as technical performance was demonstrated, Australian companies began supplying into international projects. In some cases, this was through direct export. In others, it involved partnerships, joint ventures or local manufacturing.

WHAT HAS CHANGED MORE RECENTLY IS THE INTENT.

There is a shift from opportunistic export to deliberate international positioning. Companies are designing products and processes with global markets in mind from the outset. They are aligning with international standards, investing in certification and establishing a presence in key markets. This is not limited to large organisations. Small and medium enterprises are increasingly "born global" in their thinking, even if their initial operations are domestic. The difference is that internationalisation is no longer seen as a later stage of growth - it is part of the starting point.

AT THE SAME TIME, THE BARRIERS HAVE NOT DISAPPEARED.

Working across borders introduces complexity—regulatory compliance, logistics, currency exposure, geopolitical shifts and cultural differences – in how projects are specified and delivered. In sectors such as defence and infrastructure, the requirements are even more demanding, with long qualification periods and strict standards.

There is also a practical reality. Many projects still favour local manufacturing. Proximity to the customer, shorter lead times and alignment with local standards often determine whether work is secured. That is why establishing capability in-market, rather than relying solely on export, has become more common.

FOR AUSTRALIA, THIS RAISES AN IMPORTANT POINT.

If we are to participate in global supply chains, we need to maintain a strong domestic capability base. Engineering, process development and advanced manufacturing do not develop in isolation. They require continuous investment in people, facilities and technology.

The risk is that, without that base, internationalisation becomes a one-way process—outbound capability without inbound reinforcement.

From my perspective, the opportunity is to treat international operations as an extension of the Australian capability, not a replacement for it. Engineering developed here can be applied globally. At the same time, experience gained offshore can be brought back to strengthen local operations.

After more than four decades in the industry, the direction is clear. Composites in Australia have moved from a niche material to a recognised solution across multiple sectors. The next phase is not about proving the material. It is about positioning the industry within global markets.

THAT REQUIRES A DIFFERENT MINDSET.

Not just exporting what we make, but deciding where we need to be, what capabilities we need to establish and how we integrate operations across regions.

We have done it before, often by necessity. The difference now is that our internationalisation is intentional. The future demands purposeful global engagement, building on Australian strengths and returning gained expertise to further reinforce our domestic capability and capacity.

RPC's Batam facility in Indonesia was established in the early 1990s as a production base for regional projects initially temporary,later permanent.

boeing.com.au

Exporting Composite Aerostructures: **Boeing's Australian Manufacturing Strategy**

Written by Kerryn Caulfield, Executive Director, Composites Australia Inc.

Boeing released its Commercial Market Outlook in June last year, forecasting demand for 43,600 new passenger and freighter aircraft between 2025 and 2044. Of these, 21,100 aircraft are expected to replace ageing fleets, while 22,500 will support growth, expanding the global commercial fleet from 27,150 aircraft today to 49,640 by 2044. Delivering aircraft at this scale over multiple decades will require sustained production capacity and proven engineering and manufacturing technologies capable of producing high-quality composite structures with predictable performance and repeatability.

Within this global context, Boeing Aerostructures Australia (BAA) and Boeing Technology Innovation – Australia form part of Boeing's integrated international industrial base. Operating from Fishermans Bend in Victoria, Boeing manufactures flight-critical composite aerostructures for global commercial aircraft programs. Production is export-oriented, with load-bearing aerodynamic control surfaces engineered and manufactured on site and shipped to the United States for final assembly in Seattle and Charleston, forming a defined production node within Boeing's global system. Boeing Defence Australia also currently supports defence manufacturing from the site.

EARLY YEARS

Early collaborative research on composite processes in Australia commenced in 1991 with the establishment of the Cooperative Research Centre for Aerospace Structures, which evolved into the Cooperative Research Centre for Advanced Composite Structures in 1997. This partnership was instrumental in the development and industrialisation of advanced composite manufacturing technologies, including a scalable resin infusion process capable of producing large, flight-critical aerostructures at production rate. The process eliminated the need for traditional autoclaves: dry carbon fibre reinforcements are laid up on tooling and infused with liquid resin under controlled vacuum conditions before curing, enabling consistent fibre volume, dimensional control and structural performance. These methods were certified to Boeing's airworthiness and quality standards and deployed into sustained aircraft production.

Resin infusion offers distinct advantages in manufacturing economics and scalability. Compared with autoclave-based systems, it reduces capital infrastructure requirements, lowers energy consumption and provides greater flexibility in part size and geometry. These characteristics aligned with the requirements of long-life aircraft programs such as the 787 Dreamliner, where components are delivered over decades, and production rates adjust in response to global demand.

Alongside process industrialisation, Boeing's Australian teams led applied research in resin chemistry, infusion behaviour and cure kinetics, delivering incremental process optimisation that shortened infusion and cure cycles, improved handling and safety characteristics and increased batch-to-batch consistency. New resin formulations and control methodologies were qualified and introduced into production with minimal disruption, often in collaboration with Australian universities. Through sustained process development and industrial validation, Boeing Aerostructures Australia designs and manufactures a range of flight-critical composite control surfaces, including 787 Dreamliner flaperons, inboard flaps, outboard flaps and ailerons; 737 ailerons, rudder and winglets; and 777 rudders and elevators.

Automation and digital control were progressively integrated into composite production as resin infusion matured at scale. The process architecture, with greater tooling accessibility and flexible sequencing than prepreg–autoclave systems, enabled staged deployment of robotics and collaborative automation across lay-up, infusion and finishing operations. Industrial robots and cobots for drilling, trimming, cleaning and inspection of large composite control surfaces were integrated with digitally controlled infusion and cure systems to improve repeatability and reduce manual handling and exposure to repetitive or hazardous tasks. Digital engineering tools, model-based definitions and process simulation were embedded alongside physical production, allowing manufacturing sequences to be validated virtually before factory deployment. These methodologies were subsequently transferred across Boeing manufacturing operations globally.

FROM THE 787 TO GHOST BAT

Australia's role within Boeing expanded from component supply to full aircraft design, manufacture and industrial system development through the

FISHERMANS BEND: AUSTRALIA'S LONG-STANDING AEROSPACE MANUFACTURING PRECINCT

Fishermans Bend in Victoria, one of Australia's longest-standing aerospace manufacturing precincts, is home to Boeing Aerostructures Australia and Boeing's Australian research and development facilities. The site has been a centre of aviation manufacturing since 1927, shaped by the legacy of the Government Aircraft Factory and the Commonwealth Aircraft Corporation and later by commercial and defence aerospace programs. Today, Fishermans Bend is one of Boeing's most significant composite aerostructures manufacturing locations outside the United States, supplying flight-critical components to global aircraft programs and supporting advanced research in composites, automation and digital engineering.

Advanced composite flight-critical aerostructure components are produced at scale at Boeing Aerostructures Australia's Melbourne facility for global aircraft programs.

MQ-28 Ghost Bat program — the company's largest investment in a new aircraft program outside the United States. The 38-foot (11.7-metre) jet-powered aircraft features a composite airframe engineered for range, payload integration and producibility, and represents Australia's first sovereign-designed and produced military combat aircraft in more than 50 years. Designed for both autonomous operation and coordination with crewed platforms, the aircraft can perform a range of missions, with a fighter-like speed and range.

The manufacturing capability developed on the 787 program provided a foundation for the MQ-28 Ghost Bat. The air vehicle and its production system were developed concurrently, with extensive computational modelling and digital twin simulation used to validate tooling, cure cycles and assembly sequencing prior to first-article manufacture. Resin infusion technologies refined on commercial programs were scaled to produce some of Boeing's largest single-piece composite structures. The program accelerated the use of robotic drill-and-fill, shimless assembly and additive manufacturing, removing manual drilling from final assembly.

More than 81 Australian companies, including BAE Systems Australia, Rosebank Engineering, AME Systems and Ferra Engineering, have contributed to the aircraft's production. A production and final assembly facility is being built at the Wellcamp Aerospace and Defence Precinct near Toowoomba, which will accompany design and systems development activities in Melbourne longer term.

A TALENT PIPELINE

Boeing Australia's contribution extends beyond component manufacture to engineering authority, production system design and sustained composite aerostructure manufacture at industrial scale — capability sustained by a dense engineering and skills base. Across its Australian operations, Boeing employs approximately 2,100 engineers spanning materials science, manufacturing engineering, automation, digital systems and air vehicle design. In Melbourne, Boeing undertakes an apprenticeship program, delivered in partnership with Aviation Australia. Aligned with the Certificate IV in Aeroskills (Structures) (MEA41318), the qualification is growing the talent pipeline and increasing women's participation in aviation trade roles.

Long-standing partnerships with Australian universities — including RMIT University, Swinburne University of Technology, the University of Melbourne and Monash University — support this capability through postgraduate research, industry-linked doctoral programs and applied research collaboration, feeding skills and technical expertise into Boeing's global manufacturing and R&D activities.

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aqualeisure.com.au

Aquatic Leisure Technologies: **From WA to Alabama, ALT expands Manufacturing**

Written by Kerryn Caulfield, Executive Director, Composites Australia Inc.

On the edge of the Indian Ocean, where hot, dry summers define the climate, Aquatic Leisure Technologies (ALT) has been part of the Australian backyard lifestyle through the manufacture and distribution of fibreglass pools for nearly 50 years.

Founded in Western Australia, the family-owned manufacturer operates far from its largest markets. Around 60 per cent of production leaves the state for the eastern states and export markets, a reality shaped by both demand and distance. This has led to the development of systems for marketing, customer service, handling and transport that support long-distance distribution.

The company is led by Managing Director Lynley Papineau, continuing the leadership of the family business. Its portfolio of brands is led by Aqua Technics Pools and supported by display centres in Joondalup, O'Connor and Mandurah as well as seven other displays representing the brands of Sapphire Pools, Buccaneer Swimming Pools and Riverina Pools. The dealer network spans all Australian states, as well as Canada, New Zealand, the United Kingdom and Reunion Island.

Aquatic Leisure Technologies's entry into the United States extended this model further. The initial market entry relied on supplying American distributors and dealers directly from Australian production facilities, a structure that, while effective, involved extended lead times and logistical complexity. As demand increased, manufacturing closer to the market became a practical requirement.

Following a two-year site search, Aquatic Leisure Technologies secured a 56,000-square-foot facility on a 22-acre site in Opp, Alabama, which serves as the company's North American manufacturing base. The facility has been configured to operate with the same manufacturing systems, material specifications and quality assurance procedures used in the company's Australian operations. The site's scale provides capacity for immediate production requirements and future expansion. Commissioning of the Opp facility is now underway, with production ramp-up expected during 2026. Once operational, the facility will shorten delivery timelines for US dealers and support the expansion of the company's North American dealer network.

ALT's portfolio of patented materials and process technologies, developed over many years of research and development, is a strategic asset in a highly competitive market. The US facility will manufacture Aqua Technics Pools using the company's Pool ColourGuard® and Graphene Nano-Tech® systems, developed and refined in Australia.

> *"Technology is one of the anchors of our internationalisation, our Graphene Nano-Tech® integrates advanced nanomaterials into the composite structure, delivering improvements in surface durability, colour stability and long-term structural performance. These performance properties are particularly relevant in high-UV, high-temperature environments such as the southern United States, where pool finishes are exposed to sustained environmental stress."*
> **Lynley Papineau - Managing Director**

Lew Beale, Executive Chairman, and Lynley Papineau, Managing Director, at the official opening of the Opp, Alabama manufacturing facility.

Aqua Technics' Jandakot manufacturing facility in Western Australia, a blueprint for manufacturing pools in the USA using proprietary technology.

SWEET HOME ALABAMA

Opp is located in Covington County in the southern part of the state. The town sits inland from the Gulf Coast, with road connections to regional centres and to the Port of Mobile. Alabama's only deep-water seaport, the Port of Mobile, handles containerised, break-bulk, bulk and project cargo and provides access to domestic and international shipping routes for manufacturers operating in the region.

rivieraaustralia.com

Riviera: **Exporting Australian Marine Lifestyle at Scale**

Written by Kerryn Caulfield, Executive Director, Composites Australia Inc.

Since its first U.S. export in 1983, Riviera's luxury motor yachts can today be found on the world's greatest waterways. Each yacht is designed, engineered and built for independent coastal cruising, offshore passages and extended time aboard, often in remote anchorages.

Riviera has built more than 6,300 luxury motor yachts in 46 years, accounting for substantial Australian exports over more than four decades.

Kyle Davison, Manufacturing Manager at Riviera, notes: 'We are exporting world class luxury motor yachts that are today sought after around the world for their blue water heritage, immense luxury, meticulous engineering and built to last quality. Riviera yachts are regarded as being among the finest yachts built in the world.'

From its site on the Coomera River on the Gold Coast, Riviera operates a large-scale marine manufacturing facility, the largest of its kind in the southern hemisphere. Spanning 16.8 hectares, the site accommodates concurrent yacht builds across dedicated production lines, with teams undertaking composite fabrication, engineering and systems integration, finishing trades and extensive QC processes.

The scale and layout enable consistent throughput and build quality, with multiple yachts progressing through successive simultaneous construction stages. Composite fabricators produce hulls, decks, flybridges, liners and structural components, establishing the yachts form and structural performance. Mechanical, electrical and fluid systems are then integrated, with propulsion, navigation and onboard systems installed and tested. Interior fit-out follows, undertaken by shipwrights and joiners. Each stage progresses through a defined production sequence and quality gates to final commissioning and launch at the company's private Yacht Club on the Coomera River.

Riviera's export journey began over 40 years ago, evolving into an ever-growing global dealer and service network. Initially, the company anchored its presence in the United States and Europe, laying the groundwork for future expansion. Building on this foundation, in 2012, Riviera set its sights on the Middle East and Asia, steadily growing to over 50 authorised dealerships spanning the Americas, Europe, the Middle East and Australasia. Each region brings its own distinctive challenges. More than just sales, this network delivers in-market owner care including commissioning, servicing and technical support, fostering close connections with owners. As a result, these real-world insights are fed back into ongoing refinement of yacht design and configuration across operating environments unique to geography and climate.

Riviera exhibits at major international boat shows where buyers, dealers and industry stakeholders converge, including the Fort Lauderdale International Boat Show (FLIBS), Miami International Boat Show (MIBS) and the Cannes Yachting Festival in France. These large-scale, in-water exhibitions provide a platform for unveiling new models, engaging directly with global markets and supporting dealer activity across regions.

In Australia, the annual Sanctuary Cove International Boat Show serves as the company's domestic showcase at its Gold Coast base, connecting owners, dealers and the local market while also attracting international buyers.

From the Gold Coast to the world's most celebrated waterways, Riviera's story is ultimately one of Australian craftsmanship earning its place among the finest boat builders in the world. Every yacht that leaves Coomera carries with it a distinctly Australian approach to the boating life — built for independence, engineered for endurance and designed for the open water. As Riviera continues to grow its reach across the Americas, Europe, the Middle East, Asia and beyond, it does so as an ambassador for Australia and our boating lifestyle.

The Fort Lauderdale International Boat Show (FLIBS), one of the world's largest in-water boat shows, where Riviera engages directly with international customers and supports its global dealer network.

Completed Riviera motor yachts staged at the Coomera facility prior to commissioning, delivery and export.

Composite hull structure under construction at Riviera's Coomera facility, with shaped internal elements being positioned within the mould ahead of laminate consolidation.

talon.com.au

Talon Technology - Carbon-Kevlar Hinge: **Born Global**

Written by Kerryn Caulfield, Executive Director, Composites Australia Inc.

The Carbon–Kevlar Hinge is a global product designed from the start for multiple sectors and international use. Uniquely, its continuous composite structure defines it as an alternative to conventional metal hardware. This repeatable, manufacturable and packageable component is lightweight, resists corrosion, simplifies installation and maintains a continuous load path. It offers durability, efficiency and weight savings not found in traditional options.

Based in Brookvale, Sydney, NSW, Talon Technology is a composite industrial design and R&D company specialising in carbon fibre consumer products. Its work centres on translating material behaviour into manufacturable components, and on designing and prototyping for clients in consumer electronics, furniture and sporting goods.

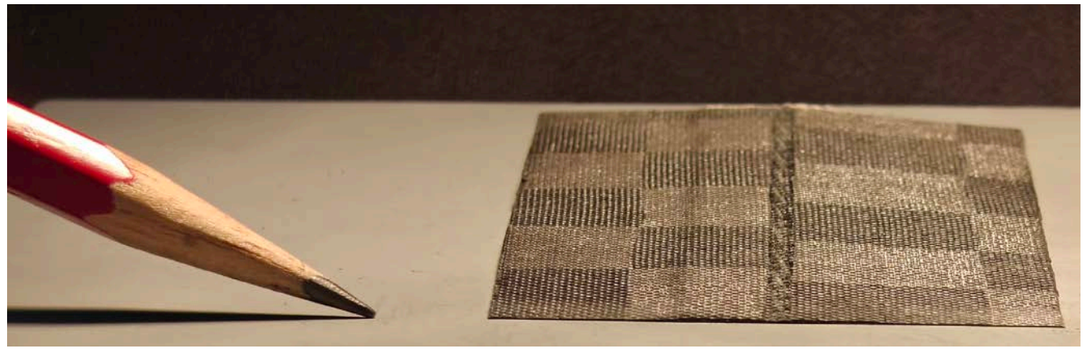
The company was founded by industrial designer Geoff Germon. Talon's earlier work in carbon fibre sporting goods includes the development of the world's first composite field hockey sticks and high-performance surfboard fins that won the Australian Design award in 2005. The 'Talon Chair', developed in the 1990s, is now held in the Power House Museum collection. These products were introduced ahead of mainstream adoption and combined material innovation with scalable manufacturing.

The Carbon–Kevlar Hinge is an in-house product developed from the outset for international markets with over 90 per cent of sales destined for export. Its origin traces to the observation of a model aircraft, where scored CFRP panels produce a hinging action comparable to fabric or leather hinges. This led to an R&D program to develop a composite hinge without metal, achieving low weight and corrosion resistance while maintaining a continuous load path through the structure. Installation and integration are simplified by eliminating conventional mortise rebates and reducing reliance on mechanical fastening.

The hinge combines rigid composite wings with a flexible centre. The wings are formed from woven carbon fibre in an epoxy matrix, with hybrid variants incorporating both carbon and glass fibres. The flexible element uses woven Kevlar impregnated with a tailored urethane system, enabling controlled movement while maintaining structural integrity. Developed through iterative work across material formulation, structural design and manufacturing process control, the co-moulded structure combines stiffness and flexibility into a single component, eliminating the need for pins, fasteners or metal interfaces.

Co-moulded carbon–Kevlar hinge integrating rigid composite wings with a flexible centre section, eliminating the need for mechanical fasteners.

Composites Australia



Hinge variants have been developed in multiple thicknesses, widths and lengths with options for pre-drilling and countersinking. Kevlar flex units are available in single-layer or heavy-duty double-layer formats. The hinge is now used in a wide variety of applications from the worlds most advanced drones to some of the world's most expensive furniture and luggage.

Ultra-thin variants, with a closed thickness of 0.8 mm, are suited to space-constrained applications, while thicker sections are designed to be installed with fasteners. The hinge allows full rotation and has been cycle tested to over one million cycles.

The pathway into advanced or regulated sectors—such as aerospace and defence—is rigorous, with defined qualification stages. In aerospace, formal assessment emphasises load behaviour and fatigue performance. In defence, additional requirements include stealth and radar transparency.

Beyond regulated sectors, the hinge is also used in standardised formats suited to high-volume production and distribution, spanning both engineered-to-specification and standardised applications. Developed in Australia and supplied internationally, the hinge is a born global product.

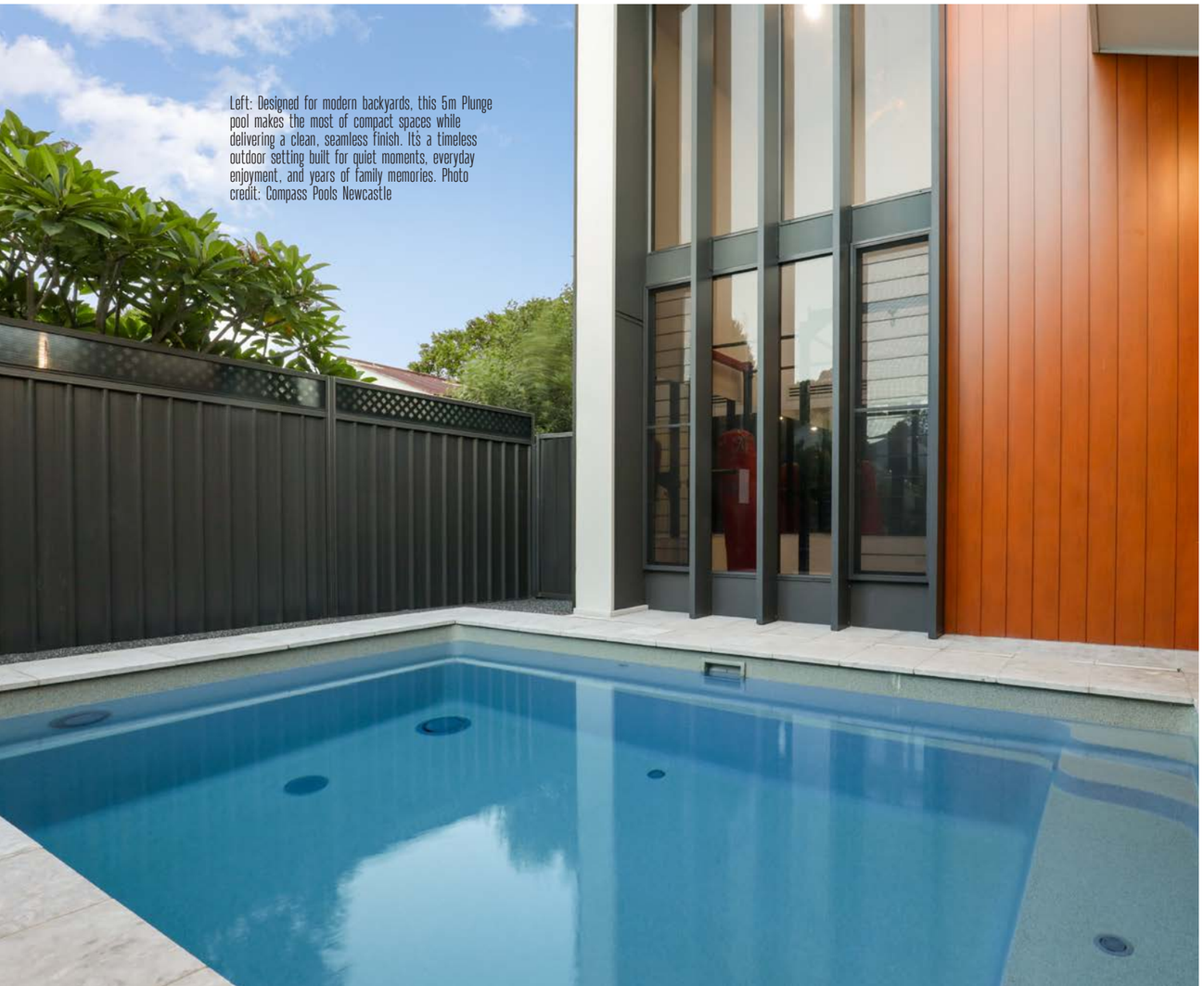
> *"Although each sector values components that are lighter, stronger and more durable, their assessment and verification processes are tailored to specific needs of the customer. For us, each application becomes its own engineering challenge and where our speed and flexibility overcomes some of the problems associated with being distant from our markets."*
>
> **Geoff Germon - CEO of Talon Technology**

compasspools.com.au

Compass Pools:
An Interview with Ian Mewett, Chasing Quality Through Chemistry

Written by Kerryn Caulfield, Executive Director, Composites Australia Inc.

A fortunate stroke of serendipity set Ian Mewett on the path to the fibreglass pool industry, though the foundations had been laid earlier. After leaving school to join the Australian Navy, he developed an appreciation for discipline, process and the importance of doing things properly the first time. Boat building followed, providing practical experience with fibreglass construction at a time when composite materials were emerging across many industries.



Left: Designed for modern backyards, this 5m Plunge pool makes the most of compact spaces while delivering a clean, seamless finish. Its a timeless outdoor setting built for quiet moments, everyday enjoyment, and years of family memories. Photo credit: Compass Pools Newcastle

Composites Australia

The professional journey that followed was inseparable from his partnership with his wife, Kerri. The two married young and assumed responsibilities early, building their working lives alongside raising a family. When Compass Pools was established in 1980, it was the continuation of a shared endeavour that had already begun shaping both their lives.

Like many small manufacturers, the company grew through experimentation, persistence and a willingness to confront technical challenges as they arose. For Ian and Kerri, the challenge was never simply to compete with concrete pools, which at the time held the lion's share of the market. "Quality was our competitor," Mewett says. "We chased quality through chemistry rather than chasing concrete." One of the early challenges was osmosis—a major source of warranty claims—arising when water penetrates the protective gelcoat. "The shift from polyester resins to epoxy vinyl ester chemistry was a turning point," Mewett says. "It gave us a far more stable barrier against water ingress."

The improvement was not inexpensive. Introducing epoxy vinyl ester chemistry increased material costs by around twenty per cent, yet the enhanced performance significantly reduced the likelihood of osmotic blistering and lowered warranty claims. As product reliability improved, the company gained the confidence to extend its warranty offering, strengthening consumer confidence in fibreglass pools as a durable, long-term alternative to concrete.

Structural design also became part of the solution. A fibreglass pool shell must withstand the combined forces of soil pressure, groundwater movement and the weight of the water it contains. Increasing panel stiffness became essential to minimise deflection under load. Drawing on principles familiar from marine composites, the company developed laminate structures incorporating a core layer to improve stiffness without significantly increasing weight.

"We were young and learning as we went," Mewett says. "One of the discoveries that made a difference was the use of ceramic microspheres. They don't absorb moisture and remain stable within the laminate. They work surprisingly hard for what is essentially an inert filler." Within the pool structure, these materials performed several functions: reinforcing the corrosion barrier within the laminate, improving resistance to moisture migration, and supporting more controlled resin curing during manufacture. Continued refinements in formulation and application enabled the company to offer lifetime guarantees against structural failure.

For the Mewetts, each improvement was part of a larger objective—building a pool that could serve families reliably for decades.

Surface performance and appearance became another focus as the company refined its pool structures. Rather than relying on standard formulations, Mewett and his team developed their own gelcoat system, incorporating decorative chips to add visual depth and improve durability. Achieving consistent application required collaboration with equipment manufacturers. The company worked with Robinson, a manufacturer of chopper-gun systems, to adapt spraying equipment to suit the viscosity and density of the new formulation.

Built on partnership, driven by purpose. Ian and Kerri Mewett laid the foundations of Compass Pools with a shared belief that quality should never be compromised. Its an ethos that continues to shape every Compass pool built today.

Much of the development occurred through experimentation. "Some of it happened by accident," Mewett recalls. The resulting technology, later branded Crystite, combined decorative chips within the gelcoat with a customised application system designed to achieve consistent thickness and surface integrity. Building on this work, the company later introduced Bi-luminite, representing a further evolution of its surface technology in response to increasing competition in international markets.

While surface technology continued to evolve, these material and process developments were complemented by system-level innovations, including the introduction of the Vantage self-cleaning system. The integrated in-floor cleaning system improved water circulation and directed debris towards collection points within the pool. Over time, this became a defining feature of the company's product offering. Today, Mewett notes, around seventy per cent of Compass pools incorporate self-cleaning systems, reflecting changing expectations among pool owners.

Chasing Quality Through Chemistry:
An interview with Ian Mewett, Co-Founder of Compass Pools

As the company matured, attention turned beyond Australia. In the United States, fibreglass pools—often referred to as one-piece pools—historically represented only a small share of the overall market, leaving significant room for growth. However, entering the United States market proved both an adventure and, at times, a misadventure.

Mewett first connected with Viking Pools in California, a manufacturer whose approach to fibreglass pools felt familiar despite the distance. “They were kindred spirits,” he says. “We shared an interest in improving the technology. They were taken with our colour range—vibrant blues and greens that glittered in daylight and under night lighting. We were also ahead in the way the pools were configured, incorporating features moulded into the shell itself rather than added later.” The relationship led to a technology transfer arrangement that helped introduce Compass surface technology into the United States.

The experience brought valuable lessons about international business and the complexities of operating in unfamiliar markets. Viking had ambitious expansion plans at the time, targeting significant annual production volumes, which made the business an attractive acquisition alongside Compass technology.

New Zealand became an early export destination, with hundreds of pools shipped across the Tasman. The business continues today through a dedicated distributor and dealer network, with the New Zealand market remaining an established part of the company’s international footprint.

Mewett notes that Australia’s geography meant many manufacturers operated in separate regional markets rather than competing directly—an environment that encouraged collaboration, stronger industry relationships and the gradual building of consumer confidence in fibreglass pools. That collaboration extended to state governments, Standards Australia and the Swimming Pool & Spa Association (SPASA), contributing to the development of a comprehensive regulatory and training framework covering construction standards, installation licensing, safety requirements and certification. Often referred to as the “Australian model”, it helped build consumer confidence and subsequent international attention.

Innovation continues as manufacturers respond to changing lifestyles and housing patterns. Smaller plunge pools, suited to compact urban blocks and easier transportation, are emerging as a new area of development and are likely to open further export opportunities.

Although Ian Mewett retired from the business over 10 years ago, Compass Pools continues under the stewardship of Anthony Cross, CEO, guided by the values established at its founding. What began as the shared endeavour of a young couple learning their trade has grown into an international business, yet it still carries the character of the family enterprise they founded.

From ground up to family retreat. Every Compass Pool begins with expert planning and craftsmanship, transforming ordinary backyards into spaces where families can relax, connect, and create lasting memories for decades to come.

The moment it all begins. For these kids, it’s not just a pool arriving, it’s years of summer memories, laughter, and family time taking shape right outside their front door.

cstcomposites.com

CST Composites:
From Australian Innovation to Global Composite Manufacturing

Written by Kerryn Caulfield, Executive Director, Composites Australia Inc.

CST Composites has established a United States manufacturing operation through its joint venture, CST Optimum, based in Utah. The facility produces filament-wound composite pressure vessels for compressed natural gas and other high-pressure applications, supplying North American automotive, aerospace, defence and energy markets. The expansion places Australian-developed filament winding technology within a US regulatory and industrial environment, where certification, proximity to customers and supply chain integration are required for market entry.

Established in 1995, CST Composites began with the design and manufacture of filament-wound carbon fibre tubing for performance sailing craft. Its operations, developed through sustained investment in engineering, R&D and process development, now includes automated filament winding, pultrusion, centre-less grinding, CNC machining, resin development, materials and finished product testing and the production of towpreg. Applications now span defence and industrial systems, components for household appliances, automotive and aerospace manufacturers and type 5 (liner-less) composite pressure vessels. Operating across two Sydney facilities, CST exports to over 20 countries and maintains an annual production capacity exceeding 100 tonnes.

Filament winding and towpreg machinery are designed and built in-house to achieve controlled fibre placement and predictable structural performance. Fibre placement from 0° to 90° is achievable. Controlled variation in wall thickness is possible for tapered structures. Finite Element Analysis (FEA) predicts stiffness, weight and thickness within 2–3% of measured performance, with in-house testing confirming results. Quality across all production lines is managed through CST's proprietary Metrix software, which tracks and summarises quality data in real time across the filament winding and towpreg machines, integrating production scheduling, bill of materials management, stock tracking and full product costing. Materials are tested in CST's on-site laboratory using DSC, TGA, FTIR, DMA and rheometer analysis.

CST Optimum filament-wound composites carbon fibre pressure vessel produced at scale across varying sizes for high-pressure energy storage.

A stand-out innovation is the Australian-made towpreg—continuous carbon fibre tows pre-impregnated with resin— process and associated machinery developed entirely in-house. Uniquely, the closed-loop control system reduces resin variability from ±3% to ±1%, with all product supplied 100% bandwidth checked during production. Applications include sailing craft, sporting goods, defence components and pressure vessels. The technology was validated at the 2024 Paris Olympics, where CST towpreg masts were used on around half the competing sailing fleet and achieved performance variation of less than 2% — down from approximately 15%.

CST's achievements have been recognised with major awards: the 2018 Endeavour Award for Global Supply Chain Integrator of the Year; the 2024 Endeavour Award for Project of the Year for Olympic sailing tow-preg masts; the 2025 Composites Australia Innovation Award and recognition among Australia's 50 Most Innovative Manufacturers for 2025 by @ AuManufacturing.

Building on this foundation, entry into the pressure vessel market occurred in early 2022 through a joint venture with Optimum Composite Technologies, Inc in the United States. This partnership leverages CST's advanced filament winding and manufacturing expertise with Optimum's design, engineering and certification expertise in composite pressure vessels. The venture currently manufactures certified composite overwrapped pressure vessels (COPVs) for compressed natural gas (CNG) and other high-pressure applications, with lightweight composite structures offering significant weight reduction over traditional steel cylinders.

Composites Australia

Filament-wound composite pressure vessels staged outside the Utah manufacturing site, ready for delivery into North American aerospace, defence and energy supply chains.

The joint venture, CST Optimum, operates in Utah within an established aerospace and defence manufacturing base, including Hill Air Force Base, Northrop Grumman, L3Harris Technologies and Boeing. The region provides access to vertically integrated supply chains, a technically trained workforce and procurement pathways. Commenting on the strategic choice of location, Glenn MacPherson, Director of Strategy and Business Development, notes "Utah offered established supply chains, operating conditions suited to scaling production and an established customer base for composite structures and high-pressure systems. This positions CST Optimum near end users, certification bodies and specialist suppliers, enabling Australian-developed filament winding systems and controls to be applied within a US regulatory and commercial framework."

CNG pressure vessels for North American applications require in-market manufacturing and alignment with US standards. CST Optimum's CNG COPVs are certified to NGV2-2023 at 250 bar service pressure, with all testing and production conducted at the Utah facility. As the hydrogen economy develops, CST Optimum is well positioned to extend its composite vessel capability into hydrogen storage, leveraging the same design, winding and certification infrastructure already established for CNG.

Australia remains central to the company's global reach. Specifically, the New South Wales facilities continue to produce filament-wound components, advance resin systems and towpreg, as well as develop machine architecture and process control. Meanwhile, the Metrix platform connects both sites, ensuring quality data and production intelligence flow consistently between Sydney and Utah. As a result, the Utah operation applies this manufacturing knowledge within a US regulatory and customer environment.

As MacPherson states, "You can't shortcut production of pressure vessels. Establishing in Utah meant embedding those processes locally while maintaining the production and control disciplines developed in Australia. It was also about being where the customers are." In line with this approach, CST Optimum extends manufacturing capability offshore while retaining design and process control in Australia. As a result, the company expands its global reach without displacing its core operations that has defined it for three decades enduring a balanced and integrated global presence.

Carbon fibre overwrapped pressure vessel following burst testing, showing fibre fracture and liner failure under extreme internal pressure.

COMPOSITE OVERWRAPPED PRESSURE VESSELS

CST Optimum designs and manufactures Type 3 and Type 4 composite overwrapped pressure vessels for compressed natural gas, hydrogen and other high-pressure applications. Type 3 vessels use aluminium liners with composite overwrap, while Type 4 vessels employ polymer liners with composite overwrap. Compared with traditional all-steel cylinders, composite vessels achieve significant weight reduction — a critical parameter in transport and aerospace systems.

In early 2024 CST Optimum began making type 4 pressure vessels for CNG and has since developed and certified 10 different sizes to the CSA/ANSI NGV 2:23 standard (which requires passing up to 14 different tests) which are being sold into the US market.

wagnerscft.com.au

Wagners CFT:
Learning the load path before scaling internationally

Written by Kerryn Caulfield, Executive Director, Composites Australia Inc.

Wagners Composite Fibre Technologies (CFT) began in 2002 as a three-person start-up following the development of its proprietary pultrusion-based process. From an initial focus on utility crossarms, the company expanded into composite poles and structural civil systems, supplying electricity and infrastructure markets across Australia and New Zealand, and subsequently North America, the United Kingdom and Europe. International growth has been driven by technical validation, compliance with jurisdictional standards and controlled expansion of manufacturing and supply capability.

> *"While EPDs provide valuable information they are also consistent with our internal values. Engineering transparency, data integrity and process discipline are embedded in the business. The EPD formalised that approach and positions us to compete in markets where verified lifecycle performance is a prerequisite."*
> **James Lorrimer - Global Utilities Lead**

Composite pole fitted with electrical hardware and conductors, demonstrating compatibility with distribution network infrastructure and in-field performance requirements.

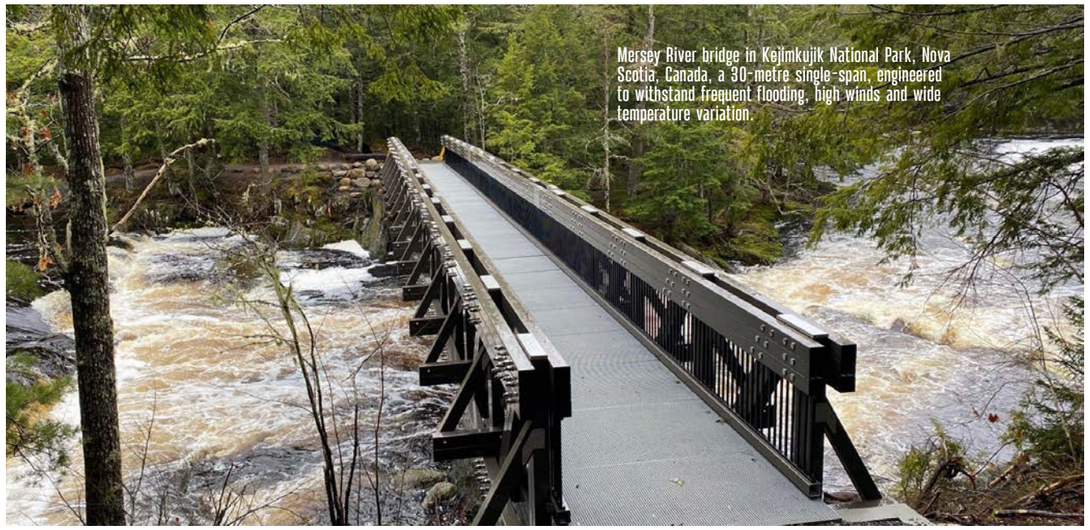
Electrical crossarms remain the company's core product, with large volumes supplied globally across a broad design family covering low-voltage, high-voltage and sub-transmission applications. The business has expanded to pedestrian infrastructure and marine piles. Increasing exposure to extreme weather and severe service environments has prompted electricity networks to formally evaluate and ultimately adopt, Fibre Reinforced Polymer (FRP) materials for long-life infrastructure. Durability, fire performance, maintenance regimes and long-term structural reliability are now, after two decades of field deployment, proven. "The engineering case is no longer theoretical — it is demonstrated in the field," said James Lorrimer, Global Utilities Lead at Wagners Composite Fibre Technologies.

Having secured domestic acceptance, Wagners CFT expanded first into New Zealand and the Pacific, followed by North America and the Middle East. Early international work centred on custom civil infrastructure projects — pedestrian bridges, boardwalks and public realm structures — delivered across varied climatic conditions and regulatory asset frameworks requiring engineering responses to corrosive, high-humidity, flood-prone and thermally variable service environments.

Wagners composite pole and crossarm assembly in service, requiring adapted installation methods and the use of elevated work platforms rather than traditional spike climbing.

Representative projects include the Sulphur Point Boardwalk on Lake Rotorua, whereby composite structures replaced timber in a geothermal setting of chemically aggressive conditions and elevated temperatures. The FRP's elastic modulus was incorporated within the structural design to accommodate gradual ground movement. In Abu Dhabi, the Jubail Mangrove Boardwalk elevated pedestrian traffic above a sensitive marine ecosystem while meeting durability requirements in a saline coastal setting. In Canada, the 30-metre single-span Mersey River Pedestrian Bridge was engineered to withstand frequent flooding, high winds and wide temperature variation. This portfolio established working relationships with designers, asset owners and contractors across multiple jurisdictions, while developing operational proficiencies in logistics, quality assurance and technical support over distance.

Entry into electricity networks required a different pathway. Utilities operate within highly regulated asset standard frameworks. Acceptance was built through staged trials, technical validation, compliance with applicable standards, assured supply continuity and accumulated service data. Composite poles and crossarms are now installed at scale in Australia and New Zealand. A strong in-service record demonstrates the reliability of composite technology and is a compelling foundation for entering global markets.



Mersey River bridge in Kejimkujik National Park, Nova Scotia, Canada, a 30-metre single-span, engineered to withstand frequent flooding, high winds and wide temperature variation.

Each market entry has required a different supply chain model. In New Zealand, a commercial decision was made to establish wholesale distribution partnerships providing in-country stockholding. The model allows network buyers and field service providers to secure less than a shipping container of material at a time which frees up budgets and reduces issues around holding stock.

The decision to invest in manufacturing capability in the United States followed approximately five years of supplying the market from Australia. This period established an understanding of regulatory frameworks, procurement systems and regional variations in practice. Initial contracts were secured in municipal infrastructure, building technical credibility and relationships with local partners before progressing to specification-driven utility markets.

Cresson, south west of Fort Worth in Texas was selected as the site for this investment, positioned within a major electricity and infrastructure corridor with direct access to transmission and distribution networks, established road and rail freight routes and a supportive industrial policy environment. The facility is being equipped with an in-house engineered pultrusion line, designed and constructed by Wagners' engineering team in Toowoomba, Queensland. "Drawing on more than two decades of accumulated process knowledge and materials engineering, we are constructing equipment that replicates the operating conditions of our Toowoomba facility," said Lorrimer. "That consistency is essential when transferring production into markets such as the United States."

According to Lorrimer, the adoption of composite poles challenges installation and maintenance practices formed by more than a century of timber pole use. Alternative materials require different handling protocols, including installation methods and maintenance procedures, as well as the use of elevated work platforms rather than spike climbing. Market entry, therefore, involves structured field trials, engagement with line crews and training across asset, safety and operational teams.

The United Kingdom and European electricity markets are the next targets for expansion, with field trials involving major distribution networks scheduled to commence this year. The UK's "ED3 (Electricity Distribution 3) - the next regulatory control period governing how UK electricity distribution network operators – stipulate environmental and resilience obligations which in turn influence material selection. Its timing positions Wagners CFT to engage with network operators during a defined capital planning window.

"As the use of traditional chemical treatments which extend the life of timber becomes increasingly restricted, networks are evaluating alternative materials," Lorrimer said. "Composite poles are manufactured under controlled industrial conditions within hours rather than taking several decades to grow, altering the supply model and supporting long-term infrastructure planning."

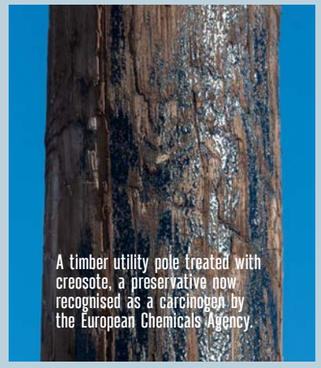
Above. Engineers and operators overseeing continuous production of a fibre-reinforced polymer (FRP) pole, where controlled resin injection and fibre architecture deliver consistent structural performance.

FRP poles prepared for transport, illustrating the scale of production and integration with heavy vehicle logistics for national and export supply.

Cresson, southwest of Fort Worth, Texas, was selected for its location within a major electricity and infrastructure corridor, with access to transmission networks, freight routes and a supportive industrial policy environment.

NEW RELIANCE ON COMPOSITE POLES

Hardwood utility poles require several decades to reach pole-grade dimensions — typically 40–70 years — constraining responsiveness within asset replacement cycles. Durability of timber poles has historically relied on preservatives such as creosote, a coal-tar–derived treatment used to resist fungal decay, termites and moisture ingress. Following its classification as a carcinogen, the European Chemicals Agency is progressively restricting the use of creosote. With customers increasingly focusing on environmental impact of products, Wagners CFT has proactively sought independent third-party accreditation of its pultruded sections in 2023 through a verified Environmental Product Declaration (EPD) prepared under Life Cycle Assessment (LCA) methodology. Embodied carbon within the built environment is frequently cited as accounting for up to 39 per cent of global emissions, placing material selection under increasing scrutiny. The LCA quantifies impacts across raw material extraction, production, use and end-of-life phases, while the EPD standardised these results for transparent comparison within specification processes.



A timber utility pole treated with creosote, a preservative now recognised as a carcinogen by the European Chemicals Agency.

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