



# TECHNOLOGY HORIZONS

A publication by Zetron, the pilot plant specialists



## ZETON AT 40: ENGINEERED FOR WHAT'S NEXT

This year marks an important milestone for Zetron: 40 years of delivering innovative, fit-for-purpose modular solutions to customers around the world. From our early beginnings to today's global footprint, Zetron's story has always been shaped by engineering excellence, collaboration and a commitment to doing things the right way.

Over four decades, Zetron has helped define how modularization can reduce risk, improve safety and accelerate project schedules, supporting clients across all process industries and modular scales. While technologies, tools and market needs have evolved, our focus has remained constant: designing and delivering modular process systems that are practical, reliable and capable of the demands put on them by technologies that push the envelope of what is possible.

This anniversary is also a celebration of our people. The expertise, creativity and dedication of Zetron employees - past and present - are the foundation of our success. Their ability to solve complex challenges and work seamlessly with our customers continues to set Zetron apart.

As we look ahead, Zetron's next chapter is about building on this legacy. We are investing in our people, tools and capabilities so we can continue helping our customers scale with confidence.

**Forty years in, Zetron is proud of where we've been and excited about where we're going next. ■**

Horizons is also available on our website at [zetron.com](https://www.zetron.com)



# KU LEUVEN AND ZETON STRENGTHEN EU RESILIENCE THROUGH CHEMICAL INNOVATION

KU Leuven's Centre for Sustainable Chemistry and Engineering (CSCE) and its Pilot Facility Biocon perform lab & pilot R&D to support a sustainable transition of the chemical industry. Their activities focus on chemical transformation of renewable carbon resources (bio, recyclates, CO<sub>2</sub>) into safe & sustainable chemicals. To reinforce Europe's technological resilience, a large support framework was launched under NextGenerationEU, including the Vlaamse Veerkracht (Flemish Resilience) program for open-innovation R&D infrastructure. Based on their track record the Biocon team secured a grant to expand its pilot processing capabilities and strengthen its role as a European hub for industrial-academic collaboration.

As part of the funded roadmap, multiple engineering firms were engaged to deliver different units. One installation presented particular complexity: integrating a new loop reactor system onto an existing 200 liter operational batch reactor, while maintaining full process safety and continuity. Because of the technical sensitivity of this integration, KU Leuven selected Zeton, known for its modular engineering expertise and proven success record in pilot scale chemical installations.

During the engineering phase, the joint team encountered a range of challenges, such as compatibility with legacy control systems and managing operations involving high temperatures and pressures across solids, liquids and gasses. Solutions were developed through close iterative collaboration: KU Leuven conducted targeted experiments, suppliers refined component specifications, and Zeton performed

theoretical modelling and practical feasibility assessments. With financial boundaries in mind, both teams invested in getting the design right. Once key risks were mapped and mitigated, detailed engineering, procurement, and construction were launched.

A strict project deadline added further constraints, requiring disciplined follow up, transparent communication, and flexibility from all partners. The installation was delivered on time, successfully passed Site Acceptance Testing (SAT), and is now entering phased operational testing. The new setup enables KU Leuven to investigate flexible reactor concepts that address key challenges in the chemical processing of renewable resources, including solid feedstocks containing inorganics, high oxygen content, elevated reactivity, and an increased risk of catalyst contamination.

This successful partnership demonstrates what is possible when academic expertise, industrial engineering excellence, and public investment align. As KU Leuven and Zeton look ahead to the next wave of innovation programs, the biorefinery loop reactor stands as a concrete example of Flemish resilience translated into technological progress. ■

*"Sustainable chemistry needs bold ideas and reliable engineering – this project delivered both."*

*Sander van den Bosch, R&D Manager Biocon: pilot facility for sustainable chemistry*

# ZETON DELIVERS CONTINUOUS PITCH PRODUCTION DEMO PLANT TO ACP TECHNOLOGIES AND PARTNERS

Zeton recently delivered a 13 module Mesophase Pitch demonstration pilot plant to ACP Technologies and their partners for a site in Ashland, Kentucky.

Zeton Inc. was selected by **ACP Technologies** (<https://acp-technologies.net/>) to deliver their patented continuous pitch production demonstration unit. The technology transforms inexpensive petroleum oils into high-value mesophase pitch. This advanced pitch product is a precursor material for synthetic graphite, low-cost carbon fiber and carbon-carbon composites. Working with ACP's core technology team, Zeton was able to expedite the overall project timeline and save over a month of fabrication time. Working with very challenging process conditions and integrating custom equipment suppliers from Europe and the U.S were some of the unique aspects of this project.



Local dignitaries, township officials and Kentucky's 5th Congressional District Representative (Mr. Hal Rogers) were all on hand for ACPT's ribbon cutting event held February 16th, in Ashland, Kentucky. ■

*"ACP's team of engineers and operators leveraged their hands-on experience and provided valuable design input to Zeton's workflow. Their informed and timely decisions allowed Zeton to do what we do best: provide scale specific solutions and deliver a first of its kind demonstration plant. This was a complex project including many stakeholders, this would have been problematic, if not for our strong project controls and the mutual respect between all parties. This is what allowed for a fast and efficient execution."*

*John Onesi, Sr. Project Manager, Zeton Inc.*

*"Zeton's executives, engineers and tradespersons were excellent to work with. They were very experienced, knowledgeable and capable, especially about pilot plant design and construction, and were responsive to our inputs each step of the way. This was a complex and challenging project that they were able to handle with confidence and great skill."*

*Tom Holcombe, CEO, ACP Technologies*

*"Today marks a truly culminating milestone for ACP Technologies and reflects years of dedication, innovation, and partnership. This pilot plant represents the next step of our vision to bring advanced carbon materials manufacturing to commercial scale in the United States. Together with Zeton, we are laying the foundation for continued innovation, job creation, and American leadership in advanced materials. "*

*Kevin Mulrenin, President of ACP Technologies.*

## FROM SUNRISE TO SUNSET: CDI IS DELIVERING ULTRA-PURE AIR SOLUTIONS

The sun sets on another successful installation for Chemical Design Inc. (CDI), marking the delivery of a high-performance Air Prepurifier System to repeat customer Ranch Cryogenics. This project reflects not only strong technical execution, but also the continued trust built through ongoing collaboration.

Ultra-pure gases (such as nitrogen, oxygen, and clean dry air) are essential across a wide range of industries, from industrial gas production to high-tech manufacturing. Chemical Designs Inc.'s Air Prepurifiers help make ultra-pure a reality.

In this application, compressed ambient air is routed through CDI's skid-mounted, fully automated Air Prepurifier System which utilizes temperature swing adsorption (TSA) technology. Within the system, key contaminants including carbon dioxide and water vapor are effectively removed to achieve outlet concentrations of less than 1 ppmv CO<sub>2</sub> and less than 0.1 ppmv H<sub>2</sub>O.

Ranch Cryogenics, a specialist in cryogenic distillation air separation, relies on this level of performance to ensure safe and efficient operation. With CDI's system in place, the risk of contamination-related freezing or fouling is significantly reduced in their downstream equipment, enabling reliable long-term plant performance.

This project underscores CDI's commitment to delivering repeatable, high-quality solutions tailored to customer needs. It was a pleasure working with Ranch Cryogenics once again, and we look forward to supporting their continued success with future installations. ■





# SCALING SILICON ANODE TECHNOLOGY: ZETON SUPPORTS SILA WITH DUAL-SITE PROJECT EXECUTION

**Zeton is proud to support Sila, a leading innovator in advanced battery materials, with two modular production plants that are essential to scaling Sila's next-generation silicon-carbon anode technology. The systems were engineered and built through a coordinated effort between Zeton Inc. (Canada) and Zeton BV (Netherlands), demonstrating how Zeton executes complex, multi-site projects to identical standards across continents with a strong focus on reliability, risk reduction, and operability.**

## Why this project matters

In Moses Lake, Washington, Sila has begun operations at the nation's first automotive-scale silicon anode plant, a 600,000-sq-ft facility on a 160-acre site designed for rapid scale-up. Initial capacity supports 2-5 GWh, with expansion potential up to 250 GWh within five years, positioning Moses Lake to become the world's largest anode production site in the western world. The plant leverages clean hydropower from the Columbia River and is part of a broader U.S. push to localize critical battery materials.

Sila's Titan Silicon™ anode material (already proven in market applications) targets ~20% higher energy density vs. leading graphite cells and supports faster charging, helping automakers and device makers deliver better performance at scale.

## From design to delivery: one integrated Zeton approach

For Sila's high-temperature silicon anode process, Zeton provided full project realisation, from detailed design and procurement to fabrication, testing, and delivery. Given the extreme operating conditions, our dedicated teams aligned closely across Canada and the Netherlands to carry out extensive engineering analyses, including detailed pipe-stress assessments, to ensure thermal stability, safety, and long-term reliability.

## Dual-site build, single standard

One modular production plant was constructed at Zeton Inc. (Canada) and another at Zeton BV (Netherlands). Both were subsequently integrated on Sila's Moses Lake site, enabling them to operate as a linked installation and support identical process parameters and performance.

Because these modular, skid-mounted systems were built off-site, installation at Moses Lake was streamlined, minimizing downtime and on-site interference.

## Global supply chain coordination - without friction

For the Dutch build, U.S.-manufactured core equipment was coordinated via Zeton Inc., then shipped and integrated seamlessly at Zeton BV. This efficient cross-continental execution demonstrates Zeton's ability to bridge North American and European supply chains, enabling customers to scale faster and with reduced project risk, regardless of geography.

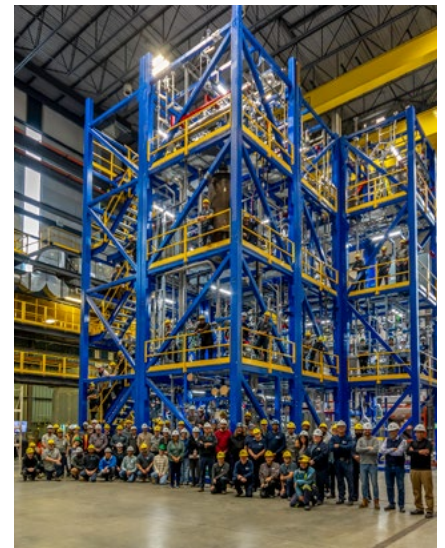
## Engineered for extreme conditions

Zeton's integrated design-build method ensured installations with spacious, safe, and industrial-grade operability, optimizing functionality for high-temperature processes.

Close collaboration across disciplines ensured safety, reliability, and reproducibility throughout fabrication and site integration.

## Collaboration as the foundation for success

Projects of this complexity require tight, interdisciplinary collaboration. Sila, Zeton BV, and Zeton Inc. operated as one integrated project team, a structure that not only streamlined decision-making but also enabled a first-time-right realisation grounded in trust, transparency, and shared objectives. ■



*"The collaboration between Zeton Inc., Zeton BV, and Sila throughout this project blurred the traditional lines of project execution. The scale, technical challenges and ambitious timeline demanded a level of connectedness, creativity, and agility that truly defines how we work. Designing and delivering over 60 modules in approximately two years is an extraordinary achievement that will help drive Sila's success."*

*Oliver Orrell, VP of Operations*

*"It was truly inspiring to work with SILA to bring their ambitious plans to life - a collaboration where innovation and teamwork went hand in hand"*

*Maikel de Vries, Project Manager Zeton BV*

*"Through extraordinary commitment and innovation, Zeton successfully realized a first-of-its-kind project under extreme time pressure and demanding design conditions."*

*Tom Queitzsch, Supply Chain, Sila*

# OUR PEOPLE, OUR STRENGTH



**John Grieve, 40 years**

"The expertise and diversity of the staff Zeton now employs, and to have been a part of the company from its inception."



**Robin McCallum, 27 Years**

"The life long friendships that I have forged in my time here are most memorable."



**Henk Naber, 38 years**

"First large transport. 10 trucks in the evening crossing the city of Enschede, with lot's of people watching."



**Peter Kolkman, 26 years**

"Traditional Korean dining with the customer... floor seating included."



**Michel Koebrugge, 36 years**

"My first flight to Trondheim and the return trip, which was severely delayed due to a snowstorm."



**Han van de Riet, 26 years**

"Moving from Pantheon to Marssteden required a significant investment."



**Johan ter Harmsel, 35 years**

"Conference in Kruger Park, enjoying game-drives and 2 new projects"



**Jochem Brandwaagt, 26 years**

"During my exchange, I attended a Toronto Maple Leafs NHL game. Still have the puck on my desk!"



**Adrienne Fortune, 31 Years**

"Kindness still abounds at Zeton, through all levels of staff, in every nook and cranny."



**Hans Jurgen Koele, 25 years**

"Our larger projects. As PM, leading hands-on and staying close to engineering from first design to on-site delivery"



**Ruud Mennink, 31 years**

"In '98 we tested our polypropylene plant at the customer's facility and successfully produced product during initial test runs."



**Kim Galipeau, 25 Years**

"Watching and experiencing Zeton's growth has been amazing. I am very proud to be part of the Zeton team."



**Janet van der Woude, 31 years**

"Zeton B.V.'s growth? Big enough to punch a few holes in the roof."



**Kellie Taylor, 25 Years**

"Watching our company grow and excel with great co-workers."



**Hans Nijmeijer, 29 Years**

"The care and support from Zeton and colleagues after my accident meant a lot"



**Herman Bottenberg, 25 years**

"2005, my first strategy weekend in Canada, experiencing true collaboration between the affiliates!"

# COLLEAGUES WITH 20+ YEARS AT ZETON SHARE THE MOMENTS AND EXPERIENCES THAT STAYED WITH THEM.



**Leisl Dukhedin-Lalla, 25 Years**

"Took the "dolt" test in 2001 and debated the answers. 25 years later and still loving it!"



**Vince Antolin, 20 Years**

"Proud to work where instrumentation, electrical innovation, environmental care, and great people come together."



**Erik Staarman, 24 years**

"A few of our projects literally went through the roof on their way to the customer."



**Eden Osman, 20 Years**

"The grand opening of the Michigan Drive facility and being part of the growth of the Zeton team."



**Maurice Bodegom, 24 years**

"Delivered my last project as Project Manager (PM) with a clean sheet; zero client punches."



**Ryan Grantham, 20 Years**

"Two decades at Zeton, rising through three promotions. Challenging and rewarding projects alongside outstanding teams."



**Rebecca Vrielink, 23 years**

"In 2006, the beach games in Ostend and the falconry in Bruges. Amazing!"



**Shoaib Nizami, 20 Years**

"Zeton has provided stability, growth, and opportunities that defined my 20-year journey."



**Chris Hart, 22 Years**

"I have met and worked with many great people over the 20+ years that I've been here."



**Ravin Dave, 20 Years**

"2006 - Joined to stay a few years for my P.Eng.; 2026- I'm still here. Proof - Zeton makes people stay and grow."



**Marco Geissler, 21 years**

"Working on-site with the team to deliver a plant that leaves the customer fully satisfied."



**Ravindra Chawla, 20 Years**

"I love being part of this unique organisation. Variety of projects built is amazing. Learning never stops here."



**Branka Matic, 20 Years**

"Being an electrician, a supervisor, a coworker, a friend and to some, a MOM"



# 40<sup>TH</sup> ZETON®

ANNIVERSARY

REALIZING THE  
FUTURE FOR  
FORTY YEARS



**Watch:**  
40 Years of Innovation:  
The Zeton Journey

# IN BRIEF

## HIGHLIGHTING RECENT AND COMPLETED PROJECTS AND ENGINEERING STUDIES

- A catalytic dehydrogenation pilot plant
- A methanol to SAF pilot plant
- A mobile membrane skid
- A reactive distillation performic acid pilot plant
- A pyrolysis sampling unit
- An engineering study for an atmospheric de-tritiation unit
- An engineering study for a carbon capture demonstration plant
- An engineering study for a CO<sub>2</sub> to methanol unit



A plastics recycling pilot plant



A plastics de-inking plant



A fluidized bed calcination plant



An LNG prepurifier system



## CONTACT US

TO DISCUSS YOUR PROJECT REQUIREMENTS,  
OR ITEMS IN THIS ISSUE OF HORIZONS, PLEASE CONTACT:

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