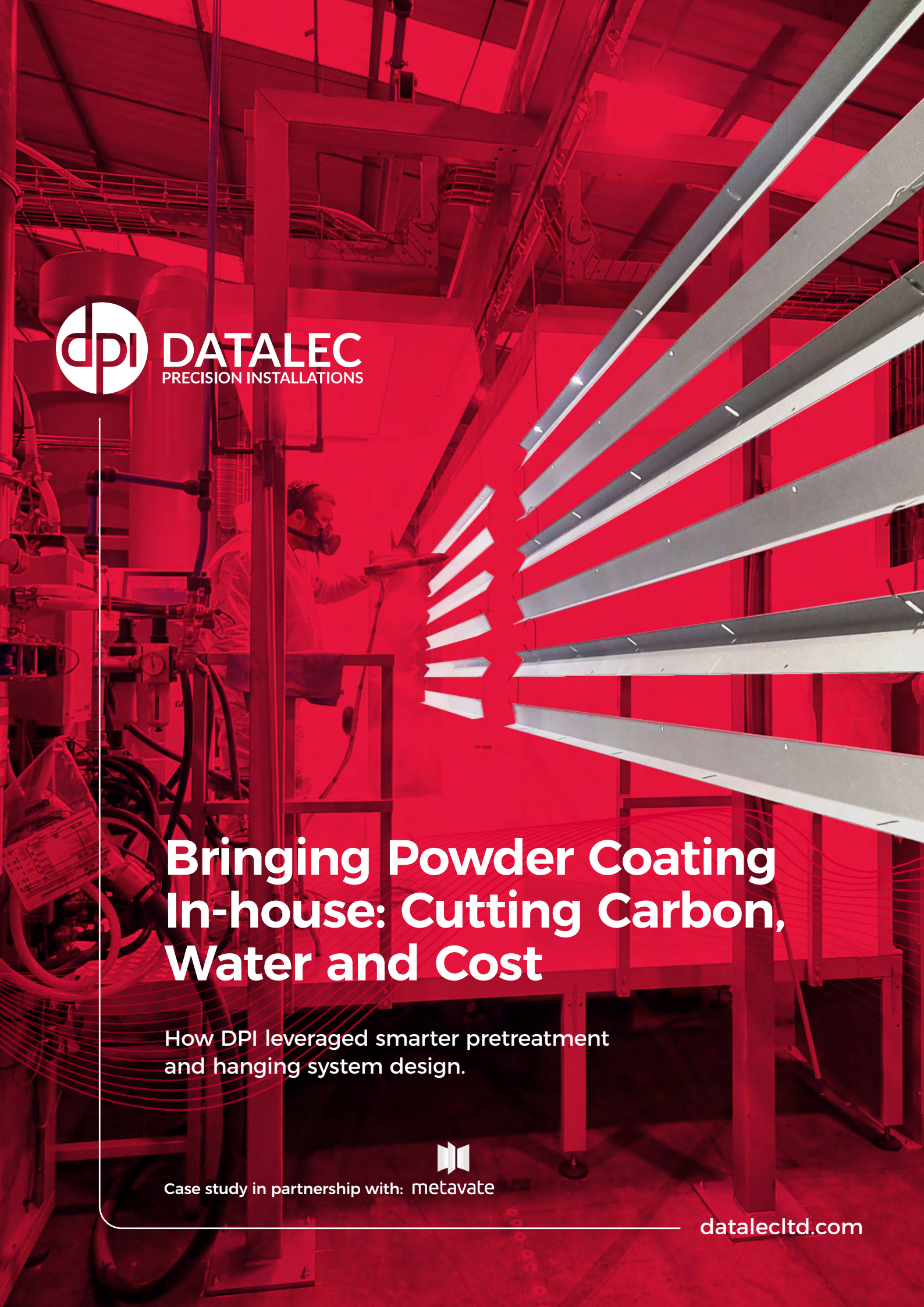


DATALEC
PRECISION INSTALLATIONS

Bringing Powder Coating In-house: Cutting Carbon, Water and Cost

How DPI leveraged smarter pretreatment and hanging system design.

Case study in partnership with: metavate

datalecltd.com

Overview

At Datalec Precision Installations (DPI), sustainability is embedded in how it designs, builds and operates its facilities. When DPI began planning its new in-house powder-coating facility at its UK headquarters, it became clear that a traditional phosphating pretreatment process would be misaligned with DPI's environmental and operational ambitions.

Traditional phosphating is water-intensive, energy-heavy, generates chemical sludge, and requires ongoing maintenance and waste handling. Instead of accepting these impacts as unavoidable, DPI partnered with Metavate to assess alternative technologies and develop a cleaner, future-focused production line.

The result was a two-part solution:

- Adoption of Metavate's Toran 3® single-step pretreatment technology.
- Optimisation of the powder-coating hanging system to increase efficiency, throughput, and environmental performance.

Together, these innovations delivered measurable reductions in carbon emissions, water consumption, energy use, waste, and operating costs, while improving productivity and workplace safety.

DPI partnered with Metavate to assess alternative technologies and develop a cleaner, future-focused production line.

The Challenge

To support growing demand from hyperscale and colocation data centre customers, DPI needed to bring powder coating in-house while improving environmental performance and maintaining tight control over quality and lead times. Prior to installation, DPI conducted a detailed review of the environmental and operational costs associated with conventional phosphating systems.

The findings highlighted several challenges:

- Very high-water consumption.
- Significant gas and electricity demand for heated tanks.
- Sludge and chemical waste requiring specialist disposal.
- Frequent tank clean-downs and intensive maintenance.
- Greater carbon footprint caused by multi-stage and heat-dependent processes.

With Environmental, Social and Governance (ESG) considerations forming a core part of DPI's business strategy, particularly around emissions reduction, cleaner manufacturing, and responsible resource use, the business needed a significantly more sustainable alternative.

The Solution: Toran 3 Pretreatment Chemistry® Technology

Metavate introduced DPI to their Toran 3® chemistry, a single-step, no-heat, no-water, no-sludge metal pretreatment process. In only a 90 second application Toran 3® degreases, cleans, polymerises, and protects metal surfaces in preparation for powder coating.

Parts are perfectly prepped for powder coating and routinely achieve over 1000 hours corrosion resistance in salt-spray testing; significantly higher levels compared to more outdated phosphating processes.

Key sustainability and operational benefits include:

- Zero water consumption.
- No sludge or chemical effluent.
- No heated tanks or burners.
- 70–85% lower carbon footprint compared to phosphating.
- Excellent corrosion protection, reducing rework and scrap.
- Simpler, safer handling for production staff.
- Significant reductions in energy use.

Metavate is proud to support DPI in enhancing both the quality and sustainability of their projects. We always enjoy working with forward-thinking companies like DPI and our flagship Toran 3® technology has helped deliver superior, finished products while providing clear, measurable sustainability benefits, enabling DPI to meet the growing demands for environmentally responsible manufacturing without compromising on performance

Rachel Stevens, Director, Metavate

Environmental & Operational Results

Water Use Eliminated

A traditional phosphating process for DPI's anticipated volumes would have needed:

- 33,312 litres of water per week.
- Over 1.59 million litres of water per year.

By adopting Toran 3® chemistry, which does not require any rinsing stages, water use for metal pretreatment was eliminated entirely.

This resulted in:

- **1.6 million litres of water saved annually.**
- **Reduced pressure on local water infrastructure.**
- **Strong alignment with DPI's ESG commitments on resource efficiency and environmental protection.**

Carbon Emissions Reduced at Multiple Stages

Phosphating systems generate carbon emissions through gas heating, electricity demand, water treatment, and chemical degradation.

Toran 3® chemistry removes these drivers entirely, delivering:

- **Up to 92.7% reduction in CO_2 emissions from pretreatment alone.**
- **Over 168,000 kg of CO_2 saved annually.**

In addition, DPI optimised its powder-coating hanging system, delivering further carbon reductions per coated product, including:

- **Up to 80% CO_2 reduction per component for small parts in a two-sprayer configuration.**
- **Up to 58% CO_2 reduction per component for larger aluminium tube applications.**
- **This combined approach dramatically accelerates DPI's progress toward lower-carbon manufacturing.**

Significant Energy Savings

Traditional phosphating relies on continuous gas heating, pumps, and temperature control. Removing this process and adopting an ambient temperature pretreatment immediately reduced energy demand.

Further gains were delivered through hanging-system redesign. Analysis shows:

- **Energy usage reduced from 2.97 kWh per product to as low as 0.45 kWh.**
- **Energy savings of up to 85% per coated product.**
- **Typical energy reductions ranging 48 - 69%, depending on component size and configuration.**

These reductions compound the benefits of Toran 3®, delivering a substantially smaller operational carbon footprint.

Hanging System Optimisation: More Output, Less Impact

Alongside pretreatment changes, DPI redesigned the hanging frames and component layout on the powder-coating line to maximise efficiency.

Key improvements included:

- **Increased hanging density from 2.2 part per metre, up to 15.2 parts per metre for aluminium components and up to 78.3 parts per metre for small parts.**

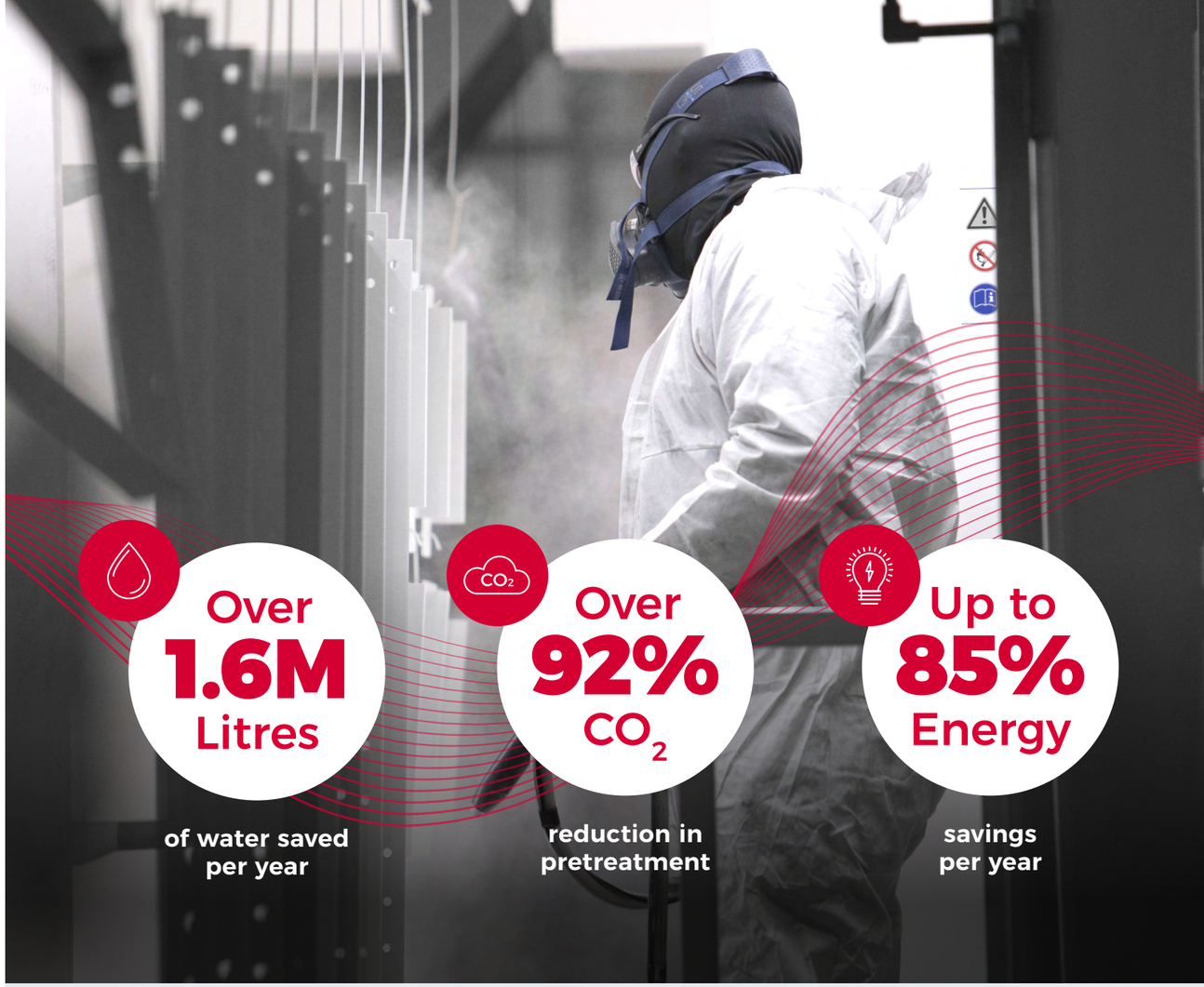
Improved coating efficiency

- **More effective spray coverage.**
- **Reduced overspray and rework.**
- **Powder waste reduced to approximately 1.2% per coated component.**

Higher productivity without increased labour

- **Staffing levels unchanged.**
- **Output per metre significantly increased.**
- **Line speed maintained at 1.4 m/min.**

This ensures DPI extracts maximum value, environmental and commercial, from every metre of production line.



Strong Financial Benefits

Although sustainability was the primary driver, the commercial advantages are clear. Combined savings were achieved across:

- **Energy consumption.**
- **Water usage.**
- **Waste disposal.**
- **Powder consumption.**
- **Labour and maintenance.**

Hanging-system analysis shows total cost savings of up to 80% per coated product in best-case scenarios, with typical savings ranging 34 - 73% depending on part type.

These results prove that sustainability-led design decisions also deliver long-term cost efficiency.

Reduced Waste & Cleaner Operations

Eliminating phosphating sludge removed the need for chemical waste disposal and hazardous tank maintenance. Hanging-system optimisation further reduced powder waste and clean-down frequency.

Together, these changes delivered:

- **No sludge generation.**
- **Lower waste-disposal costs.**
- **Reduced landfill impact.**
- **Cleaner, safer production areas.**
- **Less downtime for maintenance.**

Benefits for Our Clients

- Faster turnaround times

Reduced reliance on external suppliers enables quicker delivery and greater responsiveness to project demands.

- Enhanced ESG reporting

Improved data visibility supports stronger, more transparent reporting to boards and stakeholders

- Reliable quality control (QC)

Consistent processes and oversight ensure high-quality, repeatable outcomes.

- Reduced programme and project risk

Greater control and coordination minimise delays, mitigate issues early, and improve overall project certainty.

Our powder coating solutions are designed around our clients' real-world needs.

Impact on DPI's ESG Strategy

This project strengthens DPI's ESG performance across all three pillars:

Environmental

- **Significant emissions reductions.**
- **Elimination of water use in pretreatment.**
- **Lower energy consumption.**
- **Minimal waste generation.**

Social

- **Safer conditions for production staff.**
- **Reduced exposure to heat, chemicals, and high-risk maintenance tasks.**
- **Cleaner and more ergonomic working environment.**

Governance

- **Collaboration with a like-minded, responsible technology partner.**
- **Data-driven sustainability decisions.**
- **Transparent reporting of environmental performance.**

Conclusion

DPI's adoption of Metavate's Toran 3® technology, combined with intelligent hanging-system optimisation, shows a practical and scalable route to more sustainable manufacturing.

The results speak clearly:

Major reductions in CO_2 emissions, energy use, and water consumption

A fully water-free, waste-free pretreatment process

Significant productivity and cost improvements

A cleaner, safer, and more efficient production environment

This partnership reinforces DPI's commitment to innovation, operational excellence, and responsible growth, setting a new standard for sustainability within the data-centre manufacturing sector.

This project demonstrated what's possible when technical expertise, attention to detail and a collaborative approach come together. From colour consistency and durability through to reliable lead times and clear communication, our powder coating solutions are designed around our clients' real-world needs.

If you're looking for a trusted partner to support your next project, whether you're refining an existing product or bringing something new to market, we'd welcome the opportunity to talk.

Get in touch with our team today to explore how we can collaborate with you to deliver high-quality, dependable powder coating results.

info@datalecltd.com

DATALEC
PRECISION INSTALLATIONS

+44 (0) 800 689 1318

datalecltd.com

info@datalecltd.com

Datalec Precision Installations
Milton House
Buntingford Business Park
Baldock Road
Buntingford
Hertfordshire
SG9 9ER