



SIEMENS AND RIEDEL FILTERTECHNIK – PARTNERS FOR SUSTAINABLE MANUFACTURING

Significant Emissions Reductions in Tire Production

Inovative exhaust air cleaning and integrated automation solutions from Siemens:
Unlocking energy efficiency and measurable environmental benefits.

Founded in 1920, Riedel Filtertechnik GmbH has become an established provider in industrial machinery and plant engineering. Since then, the company has evolved into a leading specialist for customized industrial solutions in environmental, air, and filtration technology. Today, Riedel Filtertechnik is a globally recognized partner for innovative solutions across a wide range of industrial sectors, including the food and beverage industry as well as rubber and tire manufacturing. In collaboration with Riedel Filtertechnik, Siemens leverages advanced technology solutions to drive the transition toward a more sustainable industry.

Siemens automation and energy-efficiency solutions that meet the EcoTech criteria, combined with the cutting-edge COPLAS clean system supplied by Riedel Filtertechnik, deliver measurable added value: greener tire production with both environmental and climate benefits. Our integrated solutions enable a significant reduction in odour emissions while simultaneously delivering substantially lower CO₂ emissions compared with conventional manufacturing methods. Siemens and Riedel jointly deliver a meaningful contribution to a sustainable future – providing efficient, tailor-made solutions that meet customer requirements.



Headquarters of Riedel Filtertechnik GmbH in Leopoldshöhe, North Rhine-Westphalia

above: COPLAS clean system, interior view

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Environmental Impacts in Automotive Tire Production

In Germany, annual sales of passenger-car, van, and truck tires total approximately 45 million, with around 30 million produced domestically, while production is primarily focused on passenger-car tires for the domestic market and export. Tire manufacturing is inherently energy-intensive, especially for the process heat required in vulcanization and for treating exhaust air contaminated with volatile organic compounds (VOCs) and odorous substances. Legal limits and strict regulatory emission standards – particularly in densely populated areas – mandate emission reductions and continuous exhaust-air monitoring.

Conventional thermal exhaust-air purification systems impose substantial additional energy demands. While process heat generation can be decarbonized through renewable energy sources and energy-efficiency technologies, exhaust-air treatment presents significant, largely untapped optimization potential. Innovative nonthermal air-purification processes offer a path forward.



COPLAS Clean Plasma Technology

Our partner Riedel Filtertechnik addresses this challenge using cold plasma technology, offering an ecologically sustainable solution for industrial air purification. The system eliminates odours without chemicals, avoids water consumption, and produces no waste. Electricity as the only required energy input is ideally supplied from renewable sources.

The technology relies on patented plasma reactors which generate reactive oxygen and hydroxyl (OH) radicals. These radicals are injected directly into the airstream on demand, oxidizing odour molecules within milliseconds. Riedel's advanced COPLAS clean system stands out against conventional

industrial odour-elimination technologies for its efficiency, sustainability, and cost-effectiveness.

Siemens as Sustainability Partner

Powerful automation and energy-efficiency solutions from Siemens unlock the full potential of COPLAS Clean technology in customer-specific applications.

The implementation of precise, continuous monitoring and demand-driven system control in real time ensures a reduction of energy consumption, which subsequently leads to a significant decrease in total operating costs. Products that already meet Siemens' EcoTech sustainability criteria are used preferentially wherever possible.

Climate-Friendly Exhaust Air Purification

Energy-efficient odour elimination: meeting regulatory mandates while lowering operational costs and environmental impact.



Facts and Figures

(Based on 6,000 operating hours/year)

Conventional solution with regenerative thermal oxidation (RTO):

21,000 MWh per year (gas and electric operation)

COPLAS clean system with Siemens energy efficiency technology:

200 MWh per year (all-electric operation)

Annual CO₂ savings:

Approx. 4,000 metric tons with consistent air purification efficiency

COPLAS clean system

Project Background

An international tire manufacturer faced the challenge of meeting strict regulatory requirements to significantly reduce production-related odours at a production site in Hesse, Germany. A powerful, sustainable, and energy-efficient solution was required to modernize the existing conventional exhaust-air purification system.

The customer's primary requirements included the complete elimination of the characteristic tire-rubber compound odour coming from the mixer and batch-off line, while ensuring continuous compliance with legal odour-emission limits. The objective was to treat an exhaust-air volume of 200,000 m³/h – previously handled thermally – while minimizing environmental impact as much as practically feasible.

Meeting Regulatory Requirements while Massively Reducing CO₂ Emissions

Our partner Riedel Filtertechnik replaced the existing regenerative thermal oxidation (RTO) system with COPLAS clean, their innovative, energy-efficient cold plasma technology. The implementation was fully data-driven, involving the collection and analysis of operating data from the production facility, along with regulatory and customer performance targets. On-site tests established the optimal system configuration and performance requirements. Based on these results, Riedel developed a customer-specific system design using powerful automation and energy-efficiency solutions provided by Siemens. Automated control and continuous process optimization therefore contribute substantially to overall energy-efficient operation.



Siemens Technology Solutions – Integrated, Single-Source Engineering

The SIMATIC S7-1500 controller offers precise process control and real-time regulation of decontamination processes, driven by its high processing speed and advanced architecture. Air quality is continuously monitored, and cleaning intensity is automatically adjusted on demand based on measured VOC levels and pollutant concentrations. The system control allows rapid adjustments in 1-percent increments to meet site-specific requirements.

The high-performance SINAMICS G220 variable-frequency drive meets a variety of challenges and is designed to operate reliably in harsh, chemically aggressive environments commonly found in tire manufacturing. Its built-in web server provides access to all functions via the high-contrast touchscreen. The robust IP55 design allows flexible installation outside the control cabinet, enabling efficient, on-demand air-volume regulation even in demanding industrial environments..

For customer-specific project engineering, Riedel Filtertechnik relies on Siemens' industry-leading TIA Portal and its seam-

lessly integrated product portfolio. The TIA Portal is designed to unify engineering and system operation, providing comprehensive and transparent access to operational data. Pollutant concentrations, cleaning intensity, and consumption metrics are continuously monitored and documented.

Constant air quality control ensures permanent compliance with regulatory limits and location-specific requirements. Collected energy performance data optimize system operation, driving continuous improvement of energy efficiency and sustainability.

SIMATIC S7-1500 and SINAMICS G220 drive in use within the COPLAS clean system

Installed Equipment

- SIMATIC S7-1500 Controller CPU 1513-1 PN (Siemens EcoTech)*
- SINAMICS G220 Variable Frequency Drive (Siemens EcoTech)*
- SENTRON Power Monitoring Device, 7KM PAC3200 (Siemens EcoTech)*
- SIMATIC HMI TP700 Comfort Panel
- SITOP UPS500S Maintenance-Free Uninterruptible Power Supply
- SIMATIC ET 200SP e-Starter (Siemens EcoTech)*

* Siemens EcoTech is an environmental product performance framework that provides industry-leading transparency on the performance of our certified products across environmental relevant criteria, enabling you to make informed choices to support your sustainability goals.

Read more on EcoTech: [siemens.com/ecotech](https://www.siemens.com/ecotech)

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Integrated cybersecurity features safeguard data integrity, defend against external threats, and enable secure remote monitoring and maintenance, ensuring continuous, reliable operation of the exhaust-air purification system. The extremely compact design

enables a fast, low-effort rooftop retrofit at the production facility without altering existing infrastructure, making the system ideal for new installations and delivering cost-effective, low-disruption modernization of existing equipment.



The SINAMICS Smart Drive Interface enables effortless operation, monitoring, maintenance, and on-site service with plain-text messages

left: Keeping an eye on plant parameters – Jörg Hippe from Siemens and Thomas Möller from Riedel Filtertechnik at the COPLAS clean system

A New Benchmark for the Tire Industry

The global market for automotive tires is continuously growing while manufacturers simultaneously face increasingly tighter regulatory requirements and evolving product demands. With rising energy costs, implementing more sustainable production processes is increasingly becoming a decisive competitive factor.

As strategic partners, Riedel Filtertechnik and Siemens set completely new standards for sustainability and energy efficiency in the field of exhaust-air purification. Their joint approach demonstrates how technical innovation, intelligent control strategies and

energy solutions can substantially reduce environmental impact while simultaneously delivering measurable operational cost savings. The closely coordinated and maintenance-friendly Siemens portfolio delivers smooth, highly reliable operation with minimal effort. Thoughtful system design and integrated diagnostic tools enable predictive maintenance, streamline servicing workflows, significantly cut downtime, and maximize overall system availability. Producers within the tire manufacturing industry benefit from an innovative, economically highly attractive solution ensuring sustainable, efficient, and future-proof production processes.

The Industry Standard, Redefined

Where Experience Meets Innovation: Experts from Siemens and Riedel Filtertechnik
Share Insights on Long-Term Shared Success



On site in Leopoldshöhe: Thomas Möller, Head of Automation, Riedel Filtertechnik | David Gnass, Head of Sales for Automotive Suppliers and Tire Industry Germany and Jörg Hippe, Account Manager, both Siemens | Thorsten Kurtz, Sales & Marketing Director, Riedel Filtertechnik (left to right)

So we're talking about a reduction in energy demand from 21,000 megawatt-hours down to 200 – roughly a hundredfold reduction. Based on similar projects, is that a realistic benchmark?

Thorsten Kurtz: *Absolutely. We've since installed our COPLAS clean system at several production facilities, working with Siemens as our automation partner. Beyond the odour control benefits, the massive energy reduction is really our primary selling point.*

Jörg Hippe: *We've been working in partnership with Riedel for years now. Their innovative cold-plasma technology as a replacement for thermal cleaning processes proved convincing from the start – a real game-changer. Since then, we've completed numerous successful projects together and have continued to deepen our collaboration.*

Herr Kurtz, Herr Möller, how would you characterize the benefits of your partnership with Siemens?

Thomas Möller: *There are significant advantages on multiple levels. The intuitive programming environment allows us to design projects efficiently and deliver tailor-made solutions to customer needs, saving time and resources and increasing our productivity in the design phase. All components communicate through standardized interfaces, which is a real benefit for commissioning and maintenance.*

Thorsten Kurtz: *We work with an international customer base, and Siemens is the established equipment supplier in the tire manufacturing sector. So integrating Siemens technology is effectively the default expectation among our customers.*



Thomas Möller: *Indeed – the dynamic system control seamlessly integrates into existing customer installations and adapts to variable airflow rates and operating conditions, ensuring optimal performance and efficiency. And equally important, remote access and diagnostic capabilities support high system availability for our customers worldwide.*



David Gnass: *Competitive manufacturing requires a high level of automation to respond flexibly to changing market demands. Siemens is a global supplier to the tire industry, and manufacturers demand end to end solutions. Producers often struggle to modernize existing installations to meet environmental regulations and also current transparency and energy efficiency requirements. In many customer installations, Siemens technology is already in place, enabling COPLAS Clean technology and exhaust air treatment control to be seamlessly integrated into the existing system architecture.*

Thorsten Kurtz: *Energy efficiency is vital to reducing our customers' operating costs and carbon footprint. Since production is typically the largest consumer, complete transparency over all consumption data forms the essential foundation for optimization. Continuous monitoring of parameters creates the data basis for ongoing energy optimization. COPLAS Clean combined with Siemens energy efficiency solutions provides customers with the information and tools they need to effectively reduce operating costs.*



Combining cold-plasma technology with Siemens Totally Integrated Automation components demonstrates the capabilities of modern exhaust-air treatment: energy-efficient, digitally connected, and precisely tailored to the customer's needs."

Thorsten Kurtz

David Gnass: *Regarding reduced operating costs, I'd also like to point out the Siemens EcoTech product performance framework, which gives our shared customers reliable sustainability benchmarks and enables informed choices to support sustainability goals. We are expanding our range of criteria-compliant products, making it easy to select labeled options right from the start of the project phase.*

Thanks to all my discussion partners – wishing you every success with your future joint projects.

Legal Manufacturer

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