



SOLAR THERMAL SOLUTION FOR PAINT SHOPS & PRODUCTION PROCESSES



GREEN ALLIANCE FOR
SUSTAINABLE PRODUCTION.

GREEN ALLIANCE

The 21st century will see mankind changing its way to use Earth's resources, turning away from today's dominant focus on consumption and heading towards sustainable ideals. This change will be extensive, but there is no alternative. Following suite of all other sectors of the globalized economy, the industrial production of goods will also encounter far-reaching transformations. Penetrating every sector, especially the generation and use of energy will face a fundamental transformation. According to everything we know now, we will no longer be able to produce energy from fossil and nuclear energy sources as this century draws to a close.

The task of actually shifting this paradigm does not lie in the future, but is a process that has long since begun. The driving force behind it can be clearly seen in today's automotive industry.

The unstoppable rise of energy prices over the medium-term, intensifying state regulations and surrounding conditions (reduction of CO₂, emissions trading) and of course, the increasingly vocal call for consumers to purchase "green products from green production" are equally posing a growing challenge for car manufacturers and automotive production line suppliers alike. Surface processing in car manufacturing demands 70% of the energy needed throughout the entire production process and as a result, offers massive potential for slashing energy consumption.

In recent years, however, optimizations made to reduce energy requirements of such process have reached their economic limits. The next rational step and at the same time an ideal answer to the above specified challenges is to meet the remaining energy demands using renewable energy.

The strategic partnership between Eisenmann AG and Ritter XL Solar GmbH starting at the beginning of 2011 combines the experience and know-how of two renowned specialists, which enables tailor-made and efficient end-to-end solutions for integrating solar thermal technology in automotive production processes.



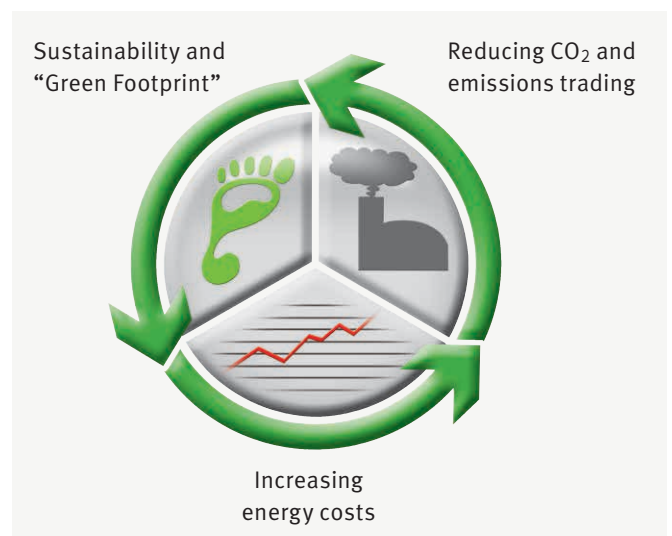
MEGATRENDS OF THE 21ST CENTURY

The megatrends of the 21st century are increasing the pressure on the automotive sector and supplier industry to act. It is becoming increasingly clear that developing and implementing energy-saving production processes are key factors of success.

The shortage of fossil energy sources, such as oil, gas or coal, coupled with steadily rising energy consumption in emerging countries, such as China, Brazil and India, will continue to a significant **drive up in energy prices**. In this regard, the integration of renewable energy sources will increase the independence of future energy price developments, create planning reliability and help to reduce production costs.

In addition to climbing energy prices, the comprehensive **CO₂ regulations** from the Kyoto protocol and from the European Emission Act, in particular, threaten to make production costs considerably more expensive. Using solar thermal technology lowers the consumption of conventional energy sources, reducing CO₂ emissions and the need to trade CO₂ emission certificates. In turn, this also cuts production costs and preserves the environment. The debate held in all industrial countries concerning the greenhouse gas effect, climate change and the measures required to abate adverse environmental impacts has altered the awareness of car manufacturers and users alike.

Sustainable management and complying with the **“Green Footprint”** guidelines are a logical conclusion derived from this transformation. The solar thermal solution from Eisenmann and Ritter XL Solar can make a valuable contribution towards achieving the “green production plant”.



Calculation example for typical sites

Pretreatment process 800 kW required power 6,000 h/a (3 shift-operation) 4,800 MWh/a	Solar thermal system With approx. 3,000 m ² collector surface area
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-1,500 MWh/a 3,300 MWh/a ➔ 32% energy savings	In Germany (Stuttgart)* Anticipated annual yield: approx. 500 kWh/m ² /a ◀ Solar annual yield min. 1,500 MWh/a
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-2,400 MWh/a 2,400 MWh/a ➔ 50% energy savings	In India (Pune)** Anticipated annual yield: approx. 800 kWh/m ² /a ◀ Solar annual yield min. 2,400 MWh/a
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* Average irradiation in Southern Germany: approx. 1,100 kWh/m²/a

** Average irradiation in India: approx. 2,200 kWh/m²/a. Deviations are possible.

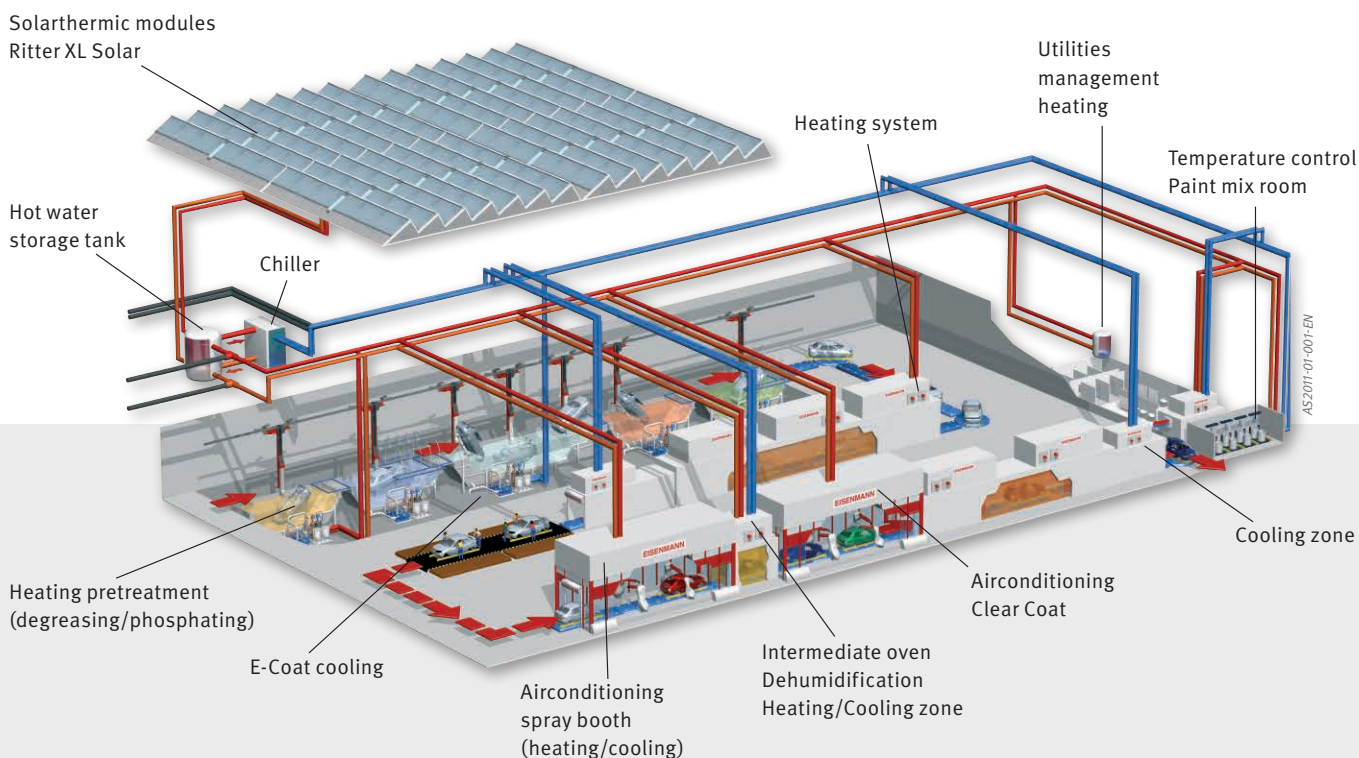
SUSTAINABILITY REQUIREMENTS BY EXAMPLE OF THE AUTOMOTIVE INDUSTRY

The automotive industry and its suppliers have recognized for a long time that a “green” final product can only be communicated in a credible fashion by incorporating “green production”.

Today’s consumers who want to know where and how their food is produced merely represent the precursor of a comprehensive, society-driven consumers claim: clear information about the sources of raw materials and the sustainability in the production of all durable consumer goods. As a result, this awareness has now spurred on almost all car manufacturers worldwide to develop broad sustainability strategies focusing on convincingly communicating their ecological competence to their customers. Looking at the sustainability reports published by all OEMs

suggests that lowering emissions, saving energy and employing efficient and alternative energy is not only important for customers, but also extremely pertinent for all car production processes and products. Above all, this has given rise to “Green Footprint” products up to now (e-mobility/low-emission concepts), though there is still enormous potential to implement low-emission and energy-saving production processes.

The collaboration between Eisenmann and Ritter XL Solar enables the serious reduction in the demand for fossil fuels in energy-intensive processes, such as surface processing in car manufacturing, by implementing energy produced by solar thermal technology.



TWO POWERFUL PARTNERS FOR ENERGY CONCEPTS IN LARGE-SCALE SYSTEMS



Ritter XL Solar, the most recent subsidiary of the Ritter Gruppe, focuses on the development, sales, planning and installation of large-scale and very large-scale solar thermal systems.

The foundation in 2010 combines the experience and expertise of the Ritter Gruppe in the field of large-scale solar energy system technology and represents the logical outcome of many years of development. Chocolate bar manufacturer Alfred Ritter and engineer Klaus Taafel established the Ritter **Energie- und Umwelttechnik** with the **brand Paradigma** back in 1988.

The critical impulse was the Chernobyl catastrophe in 1986, which contaminated most of the world's hazelnut harvest. This created serious problems for the Ritter Sport chocolate production. At the same time, the family Ritter began looking into how sustainable energy production could be implemented for people and the environment. Consequently, the solar collector in Paradigma heating systems was an integral part of the solution from the very beginning.

Paradigma soon commenced building larger-scale solar energy systems, covering up to several 100 m², using conventional technology. The Paradigma **AquaSystem** was launched in 2004 following many years of development.

The system is a brilliantly simple and extremely high-performance solar energy system equipped with evacuated tube collectors, employing water to transfer heat. The AquaSystem has now proven itself across Europe about 60,000 times in systems ranging from 3 to 30 m².

The Ritter Gruppe has been developing the **technology behind XL solar energy systems** based on the AquaSystem since 2006. It enables the construction of collector arrays of virtually any size, which can be integrated into existing or new heating systems. This has made the Ritter Gruppe a technology leader on the global market for solar thermal systems with process temperatures reaching up to 120°C. Almost 200 XL solar energy systems stretching across areas between 30 and 3,400 m² are now installed, including some of the world's largest evacuated tube collector systems. Whether it's for heating our cities or a vast range of industrial processes, Ritter XL Solar energy systems excel in efficiency not only just in sunny regions and favorable seasons. The ambition behind this long-standing development extends very far beyond. Solar energy systems built by Ritter XL Solar can supply solar heat year-round at the required temperatures and with guaranteed yields.



EISENMANN Eisenmann is one of the leading international system suppliers in surface engineering, material flow automation as well as environmental and thermal process technology. More than 3,600 employees develop new technologies and facilities for production, assembly and distribution technologies. Engineers, technicians and specialists from a wide range of fields carry out the planning, construction, system engineering and commissioning of state-of-the-art systems, including their maintenance and complete system operation.

Paint shops for the automotive industry and their suppliers

Perfect design and exceptional surface quality are the hallmarks of high-quality automobiles, resulting from an all-out engineering achievement and a paint shop that meet all demands. Eisenmann develops the system designs and technology that you need to achieve these objectives. They cover all of your paint process requirements, ranging from the application and paint supply, cataphoretic painting and all primer or top coat lines to underbody protection and cavity conservation. All this equipped with spray booths in the “clean wall design” and the highly versatile “VarioRobot” painting system. We operate as a general contractor, planning, projecting and constructing your entire turnkey paint shop. We also handle all construction measures along with the necessary building services engineering.

Environmental protection across the board

Our engineers focus on emission-free processes as well as energy and water-saving procedures. Once predefined limits are exceeded, we integrate our systems to ensure air purification, waste water treatment and waste disposal. This way, you not only preserve important resources, but you reduce your operating costs at the same time.

Eisenmann is also a leading system supplier of paint shops for mounted car parts. These systems cover metal as well as plastic parts, such as bumpers, mirror housings, frontends and other vehicle components. With more than 250 installed plastic paint shops – including some of Europe’s largest – we are the world’s market leader in this sector.



EISENMANN

Eisenmann Anlagenbau GmbH & Co. KG
Tübinger Str. 81, 71032 Böblingen, Germany
Phone +49 7031 78-0, Fax +49 7031 78-1000

www.eisenmann.com



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