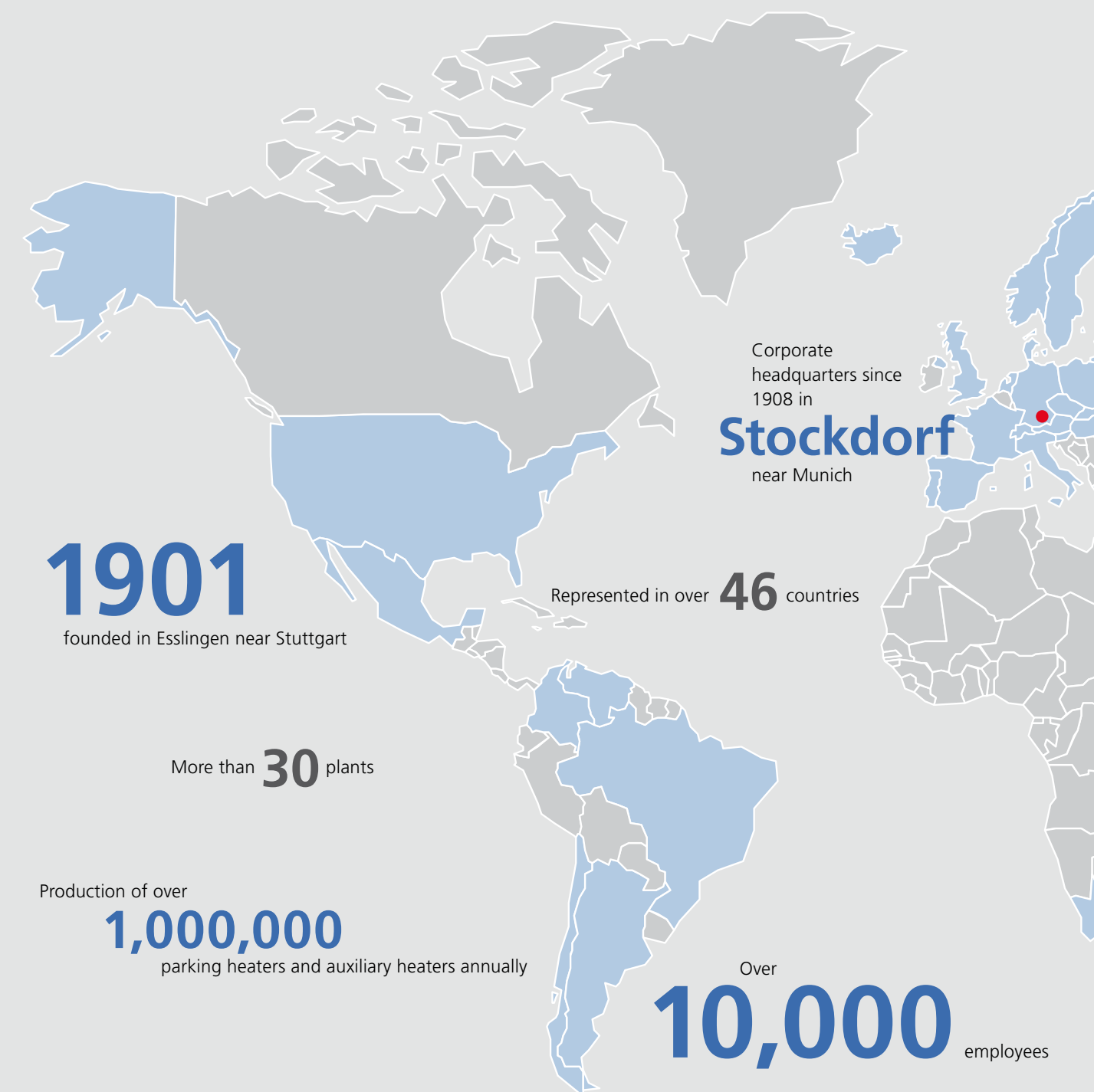


Feel the Drive

Presenting a Global Automotive Supplier



When we help shape new technologies for the mobility of tomorrow, and get a bit better at it every day. That's what means Feel the Drive.

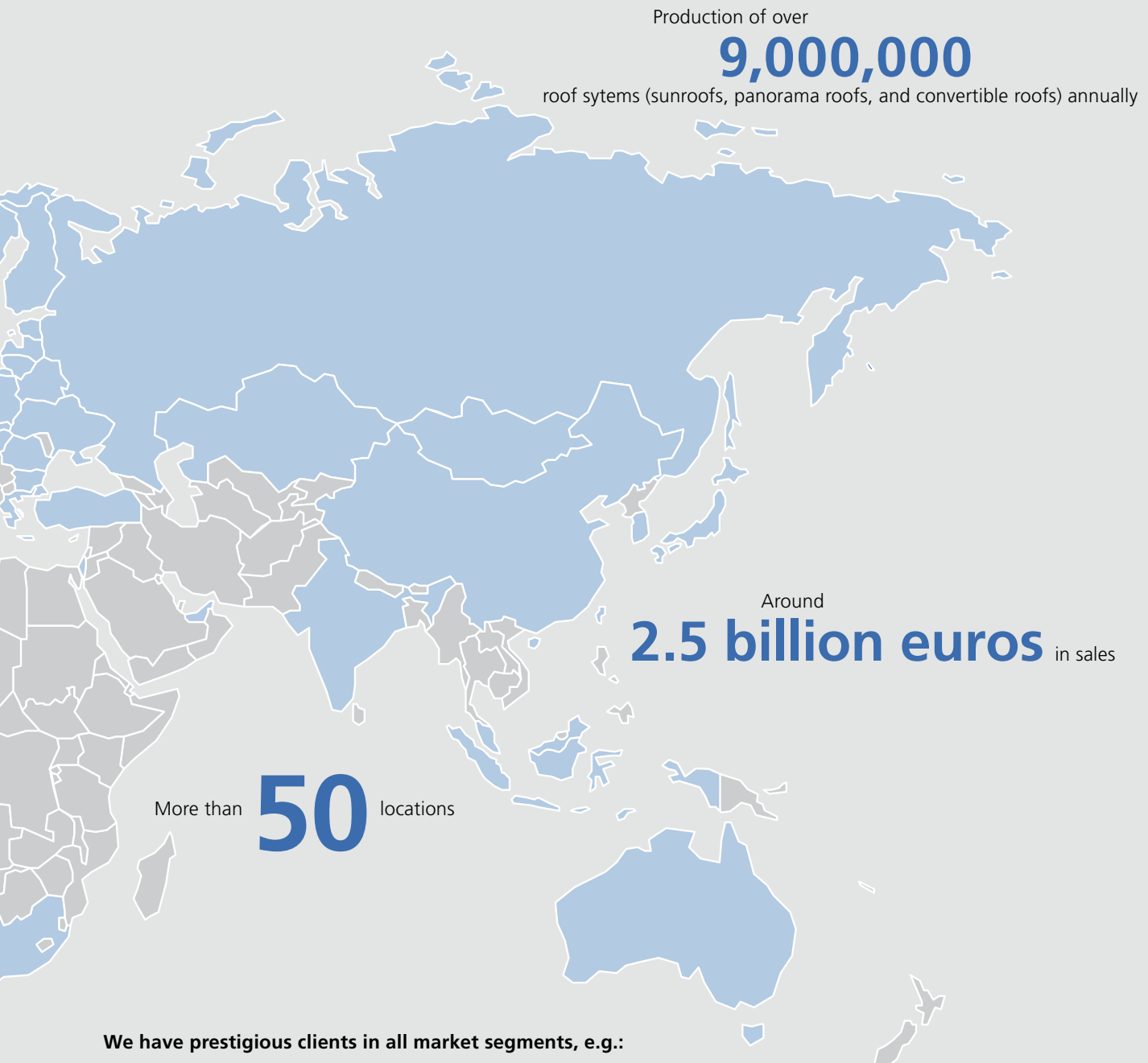


■ Webasto Subsidiaries / Representation

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Globally at Home

Webasto is the world market leader for sunroofs, convertible roofs, and thermo systems. We provide our customers around the world with solutions for enhanced security, comfort, efficiency, and driving pleasure.



We have prestigious clients in all market segments, e.g.:

AUDI, ASTON MARTIN, BMW, BAVARIA YACHTS, CATERPILLAR, CHRYSLER, DAEWOO, DEHLER, FERRARI, FIAT, FORD, FREIGHTLINER, GENERAL MOTORS, HYMER, HYUNDAI, ISUZU, IVECO, JEANNEAU, JAGUAR, LIEBHERR, KOMATSU, MAZDA, MERCEDES-BENZ, MAN, MINI, NISSAN, PACCAR, PESA, PLASSER & THEURER, PORSCHE, PSA PEUGEOT CITROËN, RENAULT, SAIC, SCANIA, SGM, ŠKODA, SSANGYONG, TOYOTA, TRIGANO, VOLVO, VOLKSWAGEN

 **lebasto**
Feel the Drive

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Webasto at a Glance

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Editorial



The Management Board of Webasto SE: Dr. Holger Engelmann (Chairman) and Dr. Joachim Damasky

Our corporate slogan “Feel the Drive” is both aspiration and philosophy. The commitment and satisfaction of our employees is what constitutes the foundation of our long-term success.

**Ladies and gentlemen,
Dear readers,**

Technological developments are setting a very rapid pace in all areas relating to mobility. Thus the form of the car of the future is becoming clearer. It will shape tomorrow's mobility, greatly changing the appearance of our streets. Along with these developments, our society is undergoing changes in attitude. Sustainability and responsible use of our resources are key issues substantially affecting the developments we are currently working on. Viewed from our perspective, safety, comfort and CO₂ reduction continue to gain in significance. Pure driving enjoyment, such as in a convertible, will also be an enduring aspect.

As the world market leader for roofs, convertible roofs and thermo systems, the satisfaction of our customers is front and center in all of this. That is why we are working closely with them to develop, manufacture, and deliver future-oriented, competitive products in the highest quality. For our customers' products are shaping the mobile world: from cars to commercial and specialty vehicles and extending to rail and recreational vehicles and boats.

It was our conscious decision to give our image brochure the title "Feel the Drive." It is our corporate slogan, and at the same time it is much more than that. It expresses our aspiration, our philosophy: to live "Feel the Drive" in our company on a daily basis. We see it as an incentive to always think well ahead or outside the box, to assume

responsibility for top quality, react quickly to new customer requirements and market conditions, transcend boundaries, and work together across borders to create new things.

We are convinced that the capacity for innovation and the philosophy of all the employees at our company was and is the key that enabled us to ascend to world leadership and to continuously retain our spot at the top. Our well-engineered and future-oriented product range underscores the fact that we are on the right track. Moreover, there are additional facets inherent in "Feel the Drive." It represents the fact that we foster team spirit and encourage open-minded interaction and constructive criticism, even across all hierarchy levels. All that makes us versatile and flexible.

The commitment and satisfaction of our employees constitute the foundation of the entrepreneurial success of our company. Webasto lives and promotes the values of a family-owned company, even with increasing size and international character. We offer attractive, exciting workplaces worldwide, personalized continuing education as well as outstanding opportunities for career advancement, and that also at the international level.

On the following pages we will introduce you to the Webasto world. We invite you to find out what drives and moves us. And what we do with it. Feel the Drive!



Dr. Holger Engelmann



Dr. Joachim Damasky



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Company

In asserting our position as the world market leader for roof and thermo systems over the long term, one of our major challenges is that of continuous change.

Therefore, our company slogan "Feel the Drive" is both a promise and an aspiration. It represents our core competence of enhancing comfort and experience, as well as efficiency in mobility. Webasto is a company imbued with dynamism and enthusiasm that is as contagious as it is impressive.

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*In conversation: Franz-Josef Kortüm,
Werner Baier and Dr. Holger Engelmann (ltr)*





A Tradition of Progress

Continuity and change. Although at first glance an inherent contradiction, both of these concepts are key elements in the successful evolution of Webasto.

Founded as a wire and ironworks factory over 110 years ago, today Webasto is one of the top 100 international automotive suppliers. Both continuity and change are important factors in our success: retaining traditional values and proven approaches while fostering innovation and being open to progress that moves us forward.

As early as the 1970's, the family-owned enterprise ventured the leap into the U.S. and Asian markets. Those moves caused quite a stir back then. But at the same time, they were important milestones on the road to world market leadership in roof systems and parking heaters. To date, maintaining the successful balance of continuity and change has produced impressive results: a sales volume of approximately two and a half billion euros, over 50 locations worldwide with more than 10,000 employees.

Dr. Holger Engelmann has been Chairman of the Management Board of Webasto SE since January 2013. He and Franz-Josef Kortüm, who led the company from 1994 until the end of 2012, and who now is a member of the Supervisory Board, share the conviction that a long-term strategy will empower the company to thrive in the future. Thus, continuity is the management objective as well as the creed of the shareholder families Baier and Mey. The descendants of company founder Wilhelm Baier hold 100 percent of the shares in Webasto. They fully support the corporate philosophy dedicated to innovation, quality, customer focus, and cost leadership. For, as Supervisory Board Chairman Werner Baier puts it, "Continuity sets the stage for transition."



The following strategy roundtable discussion between Dr. Holger Engelmann, Franz-Josef Kortüm, and Werner Baier provides insights...

... as to what constitutes the success of the family-owned company that is Webasto

Werner Baier: "Ours is an environment of positive interaction. Team spirit, lean management structures, and fast decision-making processes are attributes that characterize mid-size companies like us. We foster these values despite ongoing growth and an increasing international footprint."

Holger Engelmann: "The tools that a company engages to achieve success include long-term strategic planning, technological excellence, cost leadership and, above all, a synchronized, good working team. That requires one thing in particular: having the right people in the right positions."

Franz-Josef Kortüm: "Webasto has always had a pioneering spirit. In 1974, we founded our first joint venture in the U.S., followed by one in Japan just four years later. In the 1980's, we initiated a partnership that produced sunroofs in South Korea. Our product know-how opened doors. Today, our strong international presence ensures our



"At Webasto, we have always concentrated on the things we do best."

Werner Baier



continued growth because it reduces our dependence on the volatility of individual automotive markets."

Holger Engelmann: "In the global automotive business, risk and opportunity are very close together. Webasto has always had the ability to recognize opportunities early on. In its long history the company has always demonstrated a strong instinct for emerging trends and new developments. To stay ahead of the game, we keep a vigilant eye on markets. In this way we can identify economic shifts almost before they develop, allowing us to react quickly and adapt as necessary. That's the Webasto way; it keeps us on course."

... on the Webasto "virtues"

Holger Engelmann: "What makes us strong is our capacity for innovation in the context of the independence that our shareholders grant us. It's the key advantage that has made us leaders in our core business segments. We have a very high equity ratio and no debt, so our financial position is rock solid. This sound financial situation is due in part to our shareholding owners' policy of having left profits in the company for many years. But this goes a lot further than merely sustaining us. More than anything, it gives us staying power so we have the ability to pursue issues over the long term. We are endowed

"Even 40 years ago, technological excellence was our ticket to the international automotive universe."

Franz-Josef Kortüm

with the "luxury" of being free to take action even in challenging times."

Werner Baier: "As shareholders, we support this culture in line with our goal of preserving and promoting that autonomy."

... as to how they plan to tackle the challenges of the future

Holger Engelmann: "In recent years our company has enjoyed a high level of success. With our sales volume having doubled since the turn of the millennium, our current targets call for quadrupling results to around four billion euros by 2020. Strategically important acquisitions such as the takeover of the bankrupt convertible roof business of Edscha in 2009 have fostered our growth. Acquisitions and partnerships – whatever form that may take – will enable us to continue to enhance our technological expertise and to reinforce our position in the market. Among the great challenges facing us in the coming



“To my mind, the intercultural exchange of knowledge and experience is one of the most important sources of innovation.”

Dr. Holger Engelmann

years is the need for an across-the-board internationalization of our organization. To accomplish this, we must build globally networked teams that think and act globally in areas such as R&D, planning and production, and sales.”

Werner Baier: “Today, we operate worldwide and avoid distraction of our energies. Given our customer-focused approach, we ask ourselves time and again if that what we’re doing really creates added value.”

Franz-Josef Kortüm: “To address the volatility in the markets and the increasing scope of global competition, we have come up with an organizational structure based on the concept of the “company within a company.” That is why in mid-2012 we converted Webasto AG into the legal form of an SE (Societas Europaea). At the same time, our two divisions, one focused on roofs and the other on thermo systems, were spun off into independent legal entities, also as European stock corporations (SE).”

Holger Engelmann: “In the future, all companies in the automotive industry will have to think and act in a highly flexible manner. Our corporate structure makes it easier for us to enter into collaborative agreements or joint ventures.

Much as auto makers are increasingly focusing on collaboration, it is incumbent upon suppliers to become more agile, too. One example involves the issue of cost sharing of investments and technological developments across various stakeholders.”

... on what it takes to promote future growth

Holger Engelmann: “I dream that one day I will wake up in one of our plants and won’t know which one it is. That is part of my vision. One that is based on a production philosophy that applies the world over. This is the vision that we are gradually instituting, along with a standardized global organization. Global customer projects demand ever more tightly linked networks of international cooperation. Lean, intelligent, and streamlined standards for products coupled with efficient processes provide us with the tools to retain our cost leadership and thus ensure growth in markets such as India, Brazil and Russia.”

... as to what technological developments will have a sustained impact on Webasto’s future

Holger Engelmann: “Our current development focuses squarely on lightweight construction. The design and construc-

tion of our products in both the roof and thermo divisions must be lighter and more compact without sacrificing functionality. And we are pursuing very specific goals: It is absolutely conceivable that the weight of the panorama roofs that are in ever greater demand around the world could be cut in half. Not that we think we can achieve this tomorrow, but definitely more quickly than anyone may now imagine. In the area of heating and air-conditioning systems, we are devoting ourselves to innovative, engine-independent concepts. The goal is to ensure comfortable climate conditions in hybrid and electric vehicles, without essentially reducing their range by having them drawn from battery power. At the same time, the trend to downsizing engines is set to continue. The implications: The heating output that was a by-product of engine power is becoming less and less available as a heating source. Therefore, comfortable interior temperatures are increasingly being generated by auxiliary heaters, a market segment in which Webasto is already a leading supplier."

Franz-Josef Kortüm: "The reduction of the European legal limits for CO₂ emissions to 95 grams per kilometer by 2020 is certain to galvanize the automotive industry to strike out in new directions, as its participants seek and implement totally new solutions. Our products effectively support the efforts of car manufacturers on their road to the future."

... on how the automotive industry is dealing with social change

Holger Engelmann: "The automobile industry is facing dramatic changes. Evolving social, economic, and sociodemo-

graphic developments will have a long-term impact on people and markets around the globe. And what's more, the wheels of technology continue to spin ever faster, as development intervals are getting shorter while technological complexity grows.

The changes taking place will not be occurring at a pace that would see us overwhelmed by a complete upheaval in the market. But we must be prepared and take steps to develop the appropriate technologies and products for our customers. At the same time, changes always hold new opportunities. The increase in traffic congestion inevitably results in a slowdown of traffic. And this very slowdown will awaken new yearnings, new emotionally driven aspirations of buyers for their cars. We are in a position to fulfill such expectations. For instance, with large-scale transparent panorama roofs that flood the car with light and air and create a bright and pleasurable atmosphere."

Franz-Josef Kortüm: "That future is already here. The sharp growth in the popularity of panorama roofs worldwide, even for small vehicles, is a strong indicator of these trends. Incidentally, the role of emotional aspects is also reflected in architecture. Open, brightly lit spaces, transparency, and visual largesse are all characteristics of modern architectural styles – and that is a worldwide phenomenon. In terms of the world of cars, the convertible best articulates the overwhelming longing for light and open space. I am convinced that the first car was a convertible – and the last one will be one too!"



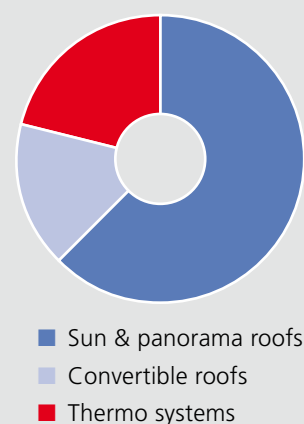
Info

Our self-image

Webasto is one of the leading global automotive suppliers and the world market leader for roof, convertible roof, and thermo systems. This both an incentive and an obligation. We are proud that our company has been family-owned since it was founded in 1901. To us, it is the long-term perspective that counts. We work with highly qualified

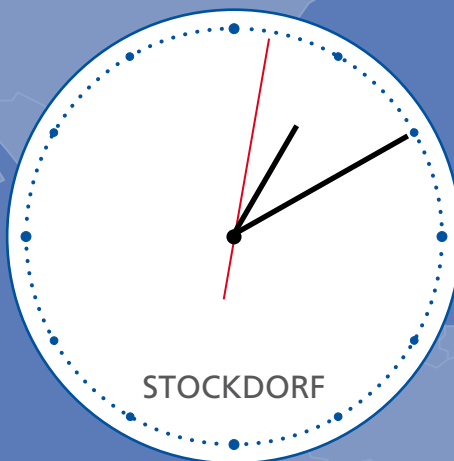
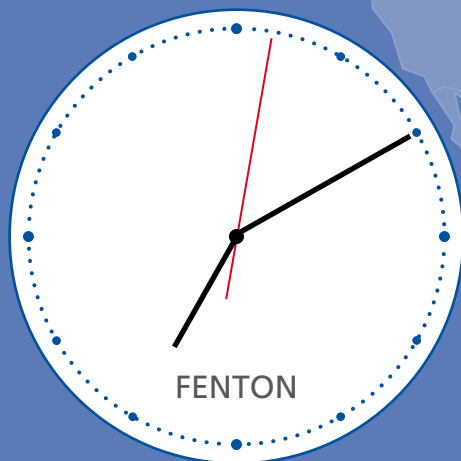
and motivated employees to achieve profitable growth. We are the number one in our core business areas. We accomplish this with quality, innovation and cost leadership. In order to attain our objectives, we invest in the future, and therefore our research & development and investment ratios are traditionally high.

Sales shares in the core business areas



Customer Focused – Anywhere in the World

At Webasto we work closely with our customers on innovative products and technologies. Our internal global networks and broad international footprint affirm one of the great strengths of this company: customer focus, anywhere in the world. Let us look at a Webasto day – at six locations on three continents.

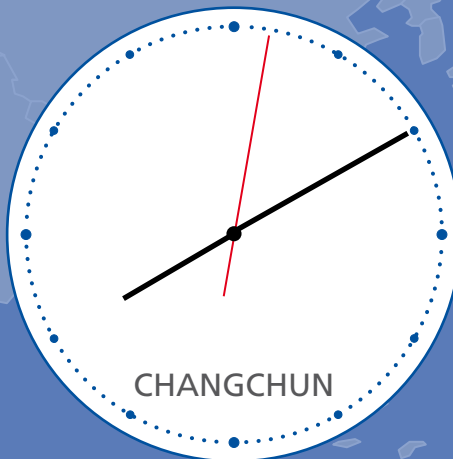
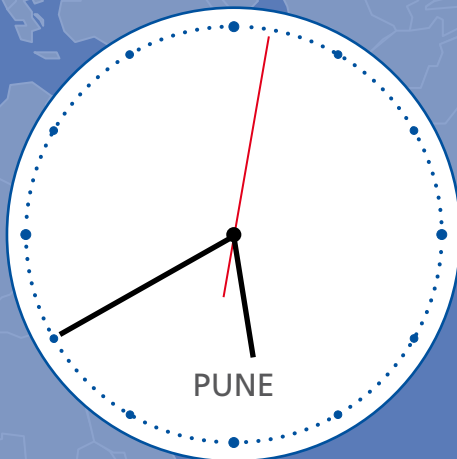


Stockdorf / Germany

1.10 p.m. CET at the company headquarters

At a board meeting Dr. Holger Engelmann, Chairman of the Webasto Board, reports on his recent trip to China, Korea, and Japan. Direct contact with people is important to him, so he regularly visits the international locations: "I find personal conversations enriching, both with our own associates and our customers. It brings people and their ideas closer together." For over 40 years Webasto has pursued a clear strategy: "We follow our customers." Dr. Engelmann will continue to adhere

to this philosophy in the future. As he phrases it: "Our strong international footprint and our competence in initiating and implementing customer projects on a global scale are competitive advantages. We are focused on expanding them." Markets such as India, Russia, and South and Central America are being carefully monitored. He continues: "We are active partners to our customers in development and production – anywhere in this world."





Fenton, Michigan/USA

**7.10 a.m. EST at the thermo location
North America**

Production in Fenton has been up and running for 15 minutes. Here, about an hour's drive from Detroit, is where parking coolers for trucks originate. This location is also where parking heaters are imported and adapted for American customers. In the U.S. the issue of heating and cooling parked vehicles is closely tied to the debate on the environment. Idling the engine to have comfortable temperatures in a vehicle is still almost the norm. "A change in attitudes is slowly taking hold. Environmental awareness is on the rise," says Managing Director Dr. Rolf Haag. "Anyone in the manufacturing sector investing in a parking heater or cooler takes a close look at fuel and cost savings," he adds. Haag is on his way out, as the head of the nearby school district is expecting him. He is looking to outfit the school buses of his district with parking heaters. "The U.S. government subsidizes these environmentally friendly measures across the country," Mr. Haag explains with a smile: "A lot of students already know what a Webasto parking heater is and what it can do."



Moscow/Russia

4.10 p.m. MSK at the thermo location

Managing Director Klaus Appel is reading reports sent to him by his colleagues in China. They are working together on a project for a Chinese truck manufacturer. His vehicles destined for export to Russia are equipped ex factory with Webasto parking heaters. The subsidiary in Moscow takes over the local customer service. "We guarantee fast and competent service anywhere in this huge country," explains Appel. Webasto is on the ground here with five of its own sales offices, and works closely with a network of 350 partners. Customers also include Japanese truck and construction equipment manufacturers, who are already making intensive use of our services. Mr. Appel's team also works with his Japanese colleagues on behalf of those customers. "Our strongest base in this market is the aftermarket business for cars and SUVs, closely followed by original equipment manufacturer orders from Russian bus and commercial vehicle makers," Appel reports. An increasing number of importers of international brands as well as private car owners in Russia are braving the long periods of cold weather with cozy warmth at the touch of a button. By the way, in Russia "Webasto" is a synonym for the term parking heater.





Pune/India

5.40 p.m IST at the roof location

The diagrams and curves posted on the information bulletin board in Vikas Prasad's office all point in one direction: upwards. India's automotive market is booming. "Experts anticipate an annual sales volume of five to six million cars by 2020," the commercial director of the Indian subsidiary for roof systems explains. According to Prasad, "Pune is the largest automotive center in the country. This is where 40 percent of the local car production takes place." Volkswagen, Mercedes-Benz, Fiat, General Motors, and the Indian manufacturers Tata Motors and Mahindra & Mahindra are already producing here. "Pune offers us favorable local conditions and good infrastructure," explains Dr. Stephan Müller von Kralik. Working out of corporate headquarters in Stockdorf, he is responsible for many of Webasto's activities in emerging markets such as those in India. Pune closely collaborates with the development and purchasing departments at the headquarters back in Germany. Everyone agrees that this location and its significance for the Webasto Group will continue to grow in the years to come.

Changchun/China

8.10 p.m. CT at the sunroof plant

Kevin Peake is truly what you would call a globetrotter: Born in the U.S., he grew up in Mexico, studied in Spain, and has been working in the automotive industry for 25 years. At Webasto he runs the Changchun plant, the largest production facility for sunroofs in China. A supplier to the international car manufacturers located in China, he and his team also deliver to local Chinese manufacturers. Chinese car buyers see sunroofs and especially large panorama roofs as absolute "must haves," so the share of vehicles thus equipped is correspondingly high. "Rapid growth is our greatest challenge," says Peake. "The implementation of streamlined processes is the only way for us to get the numerous projects done," says the plant director. So the proprietary Webasto Production System is also a "must have." Start of Production (SOP) for major models is increasingly being initiated simultaneously at multiple international plants. "We are in full control of such projects because we have teams with international experience who work very closely with our customers," Mr. Peake explains. Then he heads for a short tour around the production facility before it's time to go home.



Hiroshima/Japan

9.10 p.m. JT at the roof systems development and production site

The lights are still on in the office of Jörg Sandmann, President of Webasto Japan. He's on a conference call with his colleagues in the U.S., where morning now comes earlier. This exchange is routine. Webasto serves Japanese customers worldwide, including those in the U.S. and China. That is also why Webasto's production plants in Guangzhou and Xianyang are controlled from Japan. They are exclusive suppliers to the Chinese plants of Japanese manufacturers. "Webasto's great advantage is our long-standing international heritage," Sandmann says. "Understanding customers, their culture and work ethic, is very important. We have worked for many years to acquire this appreciation." Thus, the open-plan office is filled with something of a Babel of languages: Japanese, Chinese, Korean, English, and occasionally also German. "The number of languages is bound to increase," Mr. Sandmann asserts. He reported on the internationalization plans of the Japanese auto industry. Their sights are set on Russia, India, and also emerging markets in Southeast Asia. "That promises to be exciting." Mr. Sandmann and his team are prepared.



Environmental Compatibility “Ex Works”

At Webasto, resource conservation and sustainable product development and manufacturing mean taking responsibility for a world worth living in.



Heat producers: Test rigs for parking and auxiliary heaters in Neubrandenburg.

The world's largest manufacturing facility for parking and auxiliary heaters in Neubrandenburg is a good example of how we practice that creed at Webasto. While the longevity of the products is being tested in hundreds of durability tests, the test rigs generate a heat output of between 3 and 15 kW as a by-product of these endurance tests. In comparison, a freestanding firebox generates a heat output of about 5 kW. The heat so generated is fed directly into the heating circulation of the production floors, which are insulated according to the most up-to-date standards. The energy usage for heating dropped within three years by 35 percent, which is the equivalent of about 65,000 cubic meters (2.3 million cubic feet) of natural gas with a heat output of 762,000 kWh. That could heat about 23 single family houses for one year.

Resource-saving ways of electricity and heat generation

The roof of the Thermo division headquarters features a solar panel installation of 1,150 square meters (over 12,300 square feet) with an electric output of 46 kW that also functions as sun protection. It is the largest installation of monocrystalline, semitransparent modules on an office building in Europe. Heat for the building is provided by a wood chip fired system, and is therefore CO₂ neutral. In addition, during the summer the experimental facilities and office spaces are cooled with a deep-well water system, any excess heat of which can be used to heat the building, as necessary.

At the company headquarters in Stockdorf near Munich, since 2012 a natural-gas powered cogeneration unit has been producing both electricity and heat, while conserving resources. This state-of-the-art and efficient form of energy production is gradually also being introduced at other German and European locations.

At Webasto, environmental protection does not end at the factory gates. The company's optimized logistics concept includes, among other things, the avoidance of empty-truck trips, reuse of transport containers, and the reduction of waste due to optimized packaging units. Of course, it is almost superfluous to mention that the Webasto fleet's fuel usage is monitored with a "green" eye.

The above-mentioned examples have been selected from a broad spectrum of initiatives, technical solutions, and creative ideas that Webasto employs worldwide toward the goal of maintaining a world worth living in. The credo is "if companies take advantage of all measures to conduct business sustainably, we will succeed in leaving a sound environment for future generations."

Environmentally sound products, product development, and manufacturing that conserve resources, as well as encouraging employees' health, wellbeing and know-how – Webasto's sustainable practices rest on three principles:

Products: partner of the automotive industry

One of the most urgent challenges facing the automotive industry is the decrease of fuel consumption and the related reduction of CO₂ emissions. As a supplier, Webasto develops solutions designed to support the automobile manufacturers in this quest. That is why the subject of lightweight construction is being pushed ahead. The keywords are lightweight materials such as polycarbonate, Webasto Glas ProTec® (laminated glass), and innovative laminated materials, such as for the construction of roof shells.

Gasoline and electric cars will change the way our streets look in the coming years. Webasto is contributing its competencies in thermo and solar roofs towards these

changes. Climate control solutions for commercial vehicles that do not rely on the engine avoid idling and thus help reduce fuel consumption and harmful emissions. In the area of parking heaters, “green” solutions such as our highly efficient heating systems also support environmental protection, as do CO₂-neutral fuels, such as bioethanol, that pollute less.

Production: “going green”

The measures to conserve resources are applied worldwide, not only in terms of products but also in terms of manufacturing. The “Going Green” initiative at Webasto Roof Systems in Michigan in the USA is exemplary for this approach. The employees have agreed to common goals based on the slogan “we respect our environment and prove our commitment through our daily deeds.”

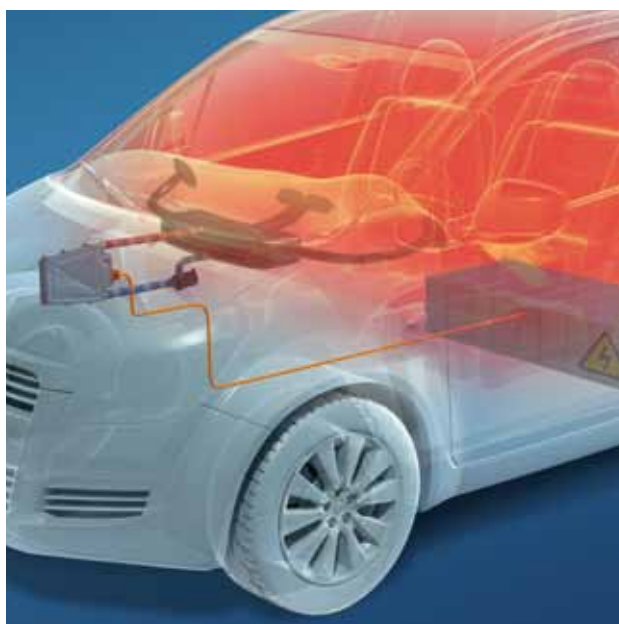
The results are impressive. By introducing the concept of recycling, the amount of trash generated was reduced by 45 percent within just one year. Many materials that used to be disposed of are now reused for other purposes. Energy use for heating purposes was also an issue: The heat generated by the factory compressors is used to heat the production facilities. The temperature in the facilities was lowered by about three to five degrees Celsius. After 5 p.m. and on weekends, the facilities are

only heated if necessary. The massive savings in energy usage were rewarded by the EPA (Environmental Protection Agency) with a tax break of \$12,000.

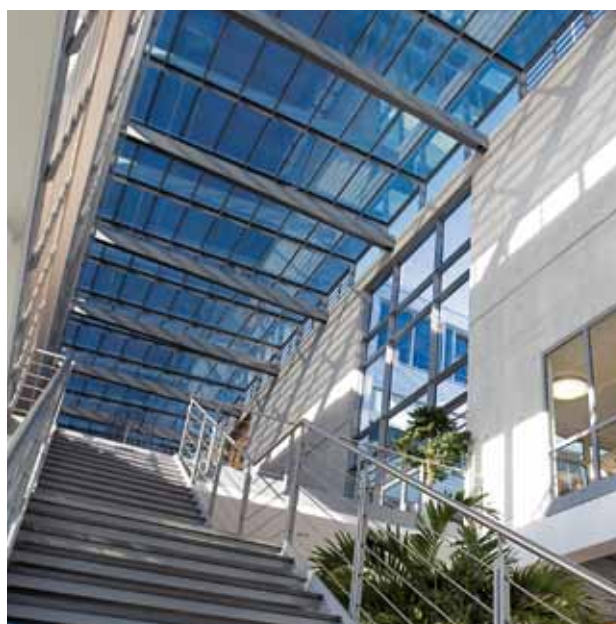
Employees: It’s everyone’s business

Sustainable business practices are a primary goal at Webasto. CEO Dr. Holger Engelmann complimented the employees’ dedication: “Our employees are the best and most creative sources of ideas. Their commitment is very important for the implementation of our environmental policies.” Webasto promotes knowledge and caring about the environment with very targeted and differentiated continuing education in all divisions.

Environmental protection and job safety are in the same hands at Webasto. At each site, designated individuals report directly to factory management and to the director of quality management and environment. In addition, a central environmental committee is active across all locations.



*Efficient heat technology for electric cars and plug-in-hybrids:
The Webasto high voltage heater transforms electricity into heat
with an efficiency of about 99 percent.*



*Efficient energy use: Webasto lowers the consumption
of resources, for example, through the use of solar energy
(image: solar panel installation at the Gilching location).*

Webasto's 10 environmental principles

1 Environmental protection – daily

We are a worldwide leading supplier to the automotive industry, creating products that contribute to more comfort and a better driving experience. Our employees implement the environmental policies in their daily work.

2 “Green” responsibility

To invest in the environment is to invest in the future. We see this as our obligation to the next generation.

3 Environmental compatibility “ex works”

When developing new products and manufacturing processes, their environmental sustainability is ensured. The legal requirements are merely a minimum standard. Webasto always looks for the best available technology while balancing the demands of profitability and environment.

4 Clear responsibilities

Each location has an environmental issues manager who ensures that relevant laws and regulations, as well as the company's own rules and instructions concerning the environmental management system, are followed.

5 Never stand still

Through the consistent aim for goals, through internal and external environmental audits, and through benchmarking with other locations, Webasto ensures the continued process of improvement also for environmental protection.

6 Conserving resources is everyone's business

We consider the frugal use of energy and water and minimizing waste and emissions to be the most important aspects of the environment. In the context of individual targets they are constantly monitored and improved.

7 Learning new things for a future worth living

Continuing education and training courses advance knowledge and consciousness about the environment. Regularly disseminating information about environmental measures motivates employees to take responsibility to be more conscious of the environment.

8 “Green” networking

The environmental issues managers exchange their experience by networking across companies.

9 Internationally sustainable

With its company policies, Webasto also pursues the consistent protection of the environment internationally. During planning and development of products and processes, the environmental management system is implemented in accordance with DIN EN ISO 14001.

10 Like-minded partners

When selecting suppliers and contractors, Webasto gives preference to companies that practice environmental policies.

People

At all of our 50 plus locations, the people of Webasto are the driving force behind the sustainable advancement of our company. This empowers us, so that in the future we will always be able to provide our customers with new products, solutions, and services. Apart from great products, we seek motivated employees. That is why our corporate culture is characterized by an open and constructively critical interaction with one another.



Webasto



I Go Global!

The automotive industry is a global business. Webasto's diverse, exciting product range offers engineers and technology experts as well as other experts such as purchasing and finance specialists the opportunity to work internationally. The following four globetrotters report on their work in the service of the company.

Jean-Luc Guicheteau is Vice President Research & Development in China and manages the sunroofs development department with approximately 80 employees in Shanghai. "It's a great challenge to develop products that are helping propel our growth trajectory in China forward," says the native Frenchman who, in addition to working for Webasto in France, has also held a European position. Guicheteau is convinced that "China will have a sustainable effect on our automotive future." That is why he encourages his young employees. "We need smart, fast-thinking people. And it is our responsibility to merge their creativity and passion for innovation with the technical expertise and experience of Webasto. This blend is the life blood of our company."



Sven Scheiner works as a technical manager at the Thermo subsidiary in Japan. He is happy that in the course of his career he has had the opportunity to work with Japanese colleagues directly out of Japan. "It allows you to broaden your horizons and accumulate experience that can be very useful elsewhere." Born in Neubrandenburg (Germany), he previously worked in the plant in Neubrandenburg as well as in Spain. His current job in Japan is as multifaceted as the product line. Among other activities, he and his team customize parking heaters for cars and trucks, for construction equipment, trains, buses and boats. Scheiner is passionate about his profession as a technician and also enjoys occasional travel. For example, in a field test that was also attended by colleagues employed at Webasto in Europe. "The cooperation and enthusiasm were fantastic."

Kozo Ohdoi is forging links for Webasto from Japan to the US. Following 11 years as Head of Research & Development in Japan, he is now the Customer Engineering Director at the U.S. headquarters in Rochester Hills (Michigan) where he manages and advises Japanese customers as they pursue U.S. expansion. "We're intensifying our local development of panorama roofs and sunroofs and making sure that we do a superb job in meeting the high quality requirements of our clients worldwide," says Ohdoi. He considers standardization in product development and in production to be crucial success factors in global competition. "This is where it's important to act quickly and efficiently." He views his move to the U.S. not only as "a valuable experience in my job," but also as "enriching my life and that of my family."



Alex Zhou is the program manager at the U.S. plant in Lexington (Kentucky) where he is responsible for costs and scheduling of sunroof projects. A native of China, his career at Webasto began in project management at the Changchun plant, where he worked for five years. Zhou is a person who is receptive to anything new. That's why in 2011 he didn't hesitate to accept the offer to work at the company headquarters. As a project manager, he was responsible for a variety of customers before moving on to the U.S. In the meantime, he has established contacts worldwide. Zhou is convinced that "working closely with people of different cultures helps you avoid mistakes because you tend to develop more appreciation for one another." When he does return to China at some point in the future, he intends to contribute his international experience there and "give back some of what the company has enabled me to do."

This Is Where We Work

More than 10,000 people work at Webasto at over 50 locations around the world. As competent contacts for clients and suppliers, they have something in common: the aspiration to enhance mobility by improving comfort, safety, environmental friendliness, and efficiency. Each in their own way and in their own position.



Rainer Beckert and Alexander Rombold

Rainer Beckert (left), Sales Manager in the roof systems segment, and Alexander Rombold, Customer Manager for OE Cars & Trucks in the thermo systems segment, are linked by their enjoyment of direct contact with customers worldwide and proximity to the markets. "The faster and better we can identify the market's requirements, the faster we are able to provide the appropriate technological solutions," Beckert explains. New ideas for products or processes may often result in the context of joint advanced development programs. At Webasto, sales is involved in these at a very early stage. "The automotive industry sets a very fast pace. We are very good at turning that around," Beckert says. "Our customers are constantly confronting us with new challenges," and that is precisely what appeals to Alexander Rombold about his job, as well as "the latitude that Webasto gives me to cope with the pending tasks at hand."

"Our company slogan Feel the Drive stands for our desire to discover new things, to make good things even better, to prefer to take a step too many forward than one back. That is what we aspire to in our work and our products – each and every day anew."

Martin French, Vice President Customer Group General Motors,
Webasto Roof Systems unit in Rochester Hills, Michigan (USA)





“It’s exciting to have a hand
in the creation of the automotive
reality of the future.”

Daniel Eckert and Matthias Dichtl

“I’m passionate about all things automotive”: Matthias Dichtl (right), Director Customer Engineering in the Roof Systems unit, knew early on that after completing his studies in mechanical engineering and economics he absolutely wanted to do something related to cars.

In 2001 he started work at Webasto, as of 2007 he was employed by a leading auto maker, and since 2010 he is back. “At Webasto, the working environment is more personal than in a large corporation. The responsibilities are not as heavily specialized while the scope of individual creativity is greater. The individual is expected to assume more responsibility,” says Dichtl. Today, he is the key technical contact for an automotive manufacturer. He coordinates the developmental activities in roof development, builds international networks while at the same time “keeping an

ear to the market.” He is certain that “the demands of the driving experience as well as a sense of well-being in the car will increase.” The worldwide trend towards ever larger glass roofs underscores this evolution.

Daniel Eckert, development engineer in the Thermo Systems segment, is also working on the car of the future. Having joined the company in 2009 as a student preparing for his bachelor’s degree, he is now employed as a design engineer focusing on innovative heating and air-conditioning devices for electric and hybrid vehicles. Above all, these vehicles must use “electricity as a fuel” sparingly. “Employees are deliberately given a lot of freedom to look to the left and right,” Eckert says. To him, taking the broader out of the box perspective is “a very attractive assignment.”

“We can only be competitive if that also applies to our vendors. The Supplier Quality Team is responsible for ensuring that this is so. Webasto also fosters the long-term development of its own employees. I like that.”

Jane Wu, Director Supplier Quality in the Roof Systems segment in Shanghai



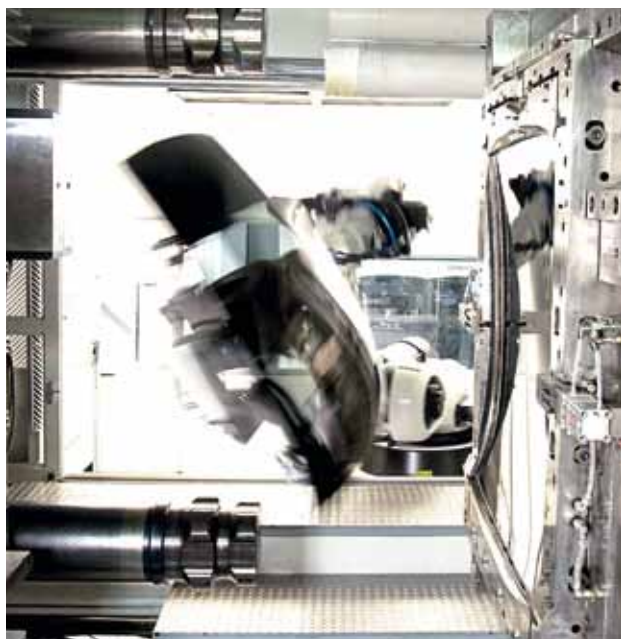
Christine Cheminay

Christine Cheminay, Director Purchasing Capital Investment & Services, enjoys working in an international environment. For the industrial engineer who wrote her degree dissertation at BMW in Japan, the global footprint of the company was one of the important criteria in her application at Webasto eleven years ago. As the director of Purchasing, her workplace is at the Group headquarters in Stockdorf. The Team of “indirect purchasing” that Ms. Cheminay heads up is responsible for worldwide purchasing of all MRO (maintenance, repair and operations) goods that are not used in production. That ranges from office supplies to services such as logistics, IT, and human resources consulting all the way to complete production facilities.

“We seek out the best solution at the best price,” is how she describes her task. Thus, close cooperation with other specialty departments is a matter of course. For example, suitable service providers are jointly identified and evaluated. That requires employees in Purchasing to see the bigger picture and “think outside the box,” Ms. Cheminay explains. Asked about the advantages of a family-owned company, she is quick to respond: “Webasto is a mid-size enterprise with flat hierarchies. Employees are allowed to assume responsibility and are also given space for their own creativity.”

A buyer must be tough on the substance, but also constructive and fair. A positive basic attitude is essential. For those who feel comfortable with this, Purchasing also offers positions suitable for newcomers.

Ms. Cheminay expressly lauds the respectful interaction in the company. Moreover, as a mother, the compatibility of family and profession is important to her. She herself reduced her job to one day a week during her parental leave. “At Webasto that is possible.”



Christine Cheminay and her team also procure the production facilities that are in use worldwide.



Jurie Doorn

The waterfront is never far from where Jurie Doorn works. Situated on the IJsselmeer, the Dutch town of Kampen is a popular sailing area. At the marina, the Webasto name is well-known – as the producer of individual air-conditioning and heating systems as well as large glass sunroofs for boats of all types. The roofs are developed and manufactured in Kampen. A technical trainer and expert for the product sector “Marine,” Doorn shares his know-how with technicians and sales specialists the world over. In the international trainer’s opinion, “In our business, personalized and competent customer consultation is the name of the game.”

In fact it was the good reputation of the company on the market that drew Doorn to Webasto. What he does here is more than just a profession; it is what he describes as “his

calling.” As he phrases it: “When you work with people, each and every day is interesting and exciting.” The trainer sees the task of passing on knowledge to colleagues and employees, which he calls “keeping them in shape” for their jobs and responsibilities, as an essential building block in securing the future of the company. “Because of the broad-based and attractive continuing education program that Webasto offers its employees, we can identify talent early on and actively promote these gifted people.”

Jurie Doorn represents the many women and men who work as trainers for Webasto worldwide. Their regular meeting point is the headquarters in Gilching. People meet there to remain up to date. “We often go there to exchange ideas,” Doorn says. For even trainers are aware that you never really know enough.



“Webasto gave me the opportunity to train for the job of a junior detail design engineer while working at my job as a vehicle saddler. I find working on new convertibles exciting but demanding. Every seam has to be precisely positioned, every detail must fit. Only perfection is good enough.”

Julia Würdinger, junior detail design engineer
at the convertible roof facility in Hengersberg

“A successful company always provides its customers with a tad more than expected. The fact that this is practiced among colleagues demonstrates professionalism. It is something you should master if you are seeking to be successful. Webasto is the world market leader.”

Bernd Joerg, Marketing and Sales Director,
Aftermarket Germany in the Thermo Systems segment



“I am fascinated by what people can generate with willpower, ideas, and engineering ingenuity. We need this innovative drive to create the mobility of tomorrow. The opportunity to make a small contribution to this motivates and empowers me.”

Josef Graubmann, Head of Business Development
Off-Highway, in the Thermo segment, in Molinella, Italy



A lot of passion for detail goes into the production of the high-quality softtops.

Michael Oswald

Lamborghini, Maserati, Bentley, Rolls Royce, Mercedes-Benz AMG – the great names in the automotive world are those that Michael Oswald, head of the convertible roofs facility in Hengersberg, deals with daily. Webasto manufactures the tops for exclusive convertibles of the celebrated car brands in low-volume series at the plant in Hengersberg. In addition, components for retractable hardtops are produced here and ultimately assembled and installed, among others, at the nearby BMW plant in Regensburg. Over 40 years ago Oswald began his training as a toolmaker in Hengersberg. And he

stayed on. Initially, he continued his education to become an industrial master craftsman, and then a REFA specialist. In 1996, Oswald assumed the management of the order processing center for convertibles as well as the planning and customer service team. Since 2006 he has been running the production plant in Lower Bavaria. His responsibility? “The production process must run smoothly.” Employee organizations, production control, and logistics are all issues he deals with on a daily basis. His goal? “Zero defects and punctual delivery. The customer has to be satisfied.”



Faruk Bilgin and Karl Stangl

England, Italy, China, Japan, the USA – Karl Stangl (left) has worked everywhere. Usually for a few weeks, sometimes even for half a year. The master production engineer of the Utting plant is an expert in the so-called foam insulation of the sliding roof glass covers with polyurethane. His know-how and long-term experience are valued by his colleagues worldwide.

Together with Karl Stangl, Faruk Bilgin has also advanced many a project. The mechanical engineer is responsible for

the international rollout of the Webasto production system, WPS for short. “In essence, it’s about eliminating waste in the entire process chain including development, purchasing, logistics, production, and sales, and continuously generating improvements,” Faruk Bilgin explains and adds: “The WPS is the guideline for a holistic approach that incorporates all specialty areas and all worldwide Webasto activities.” The experts Bilgin and Stangl agree: “Lean processes and standardization reinforce our competitiveness.”



Dr. Cornelia Löschberger

“It’s tremendously exciting to see what is currently happening in the automotive industry.” Electronics engineer Cornelia Löschberger is right in the middle of it all.

“Electronics are increasingly gaining in significance over

mechanical systems in cars,” the graduate electrical engineer declares. She works as a software specialist in Webasto’s mechatronics competence center – interdisciplinary across both of the corporate divisions Roof and Thermo.


Her work focuses primarily on the control devices, the “brains” of the electronics. There may be up to 70 control devices operating in a vehicle, with highly complex software managing all the functions, including heating, air-conditioning and even the mechanism of the roof system. “We test the software, check functionality, and thus contribute to the integration of the Webasto products into the electronic architecture of the vehicle,” Ms. Löschberger explains. “The solutions of the future warrant new competencies, and here and there some persuasion of customers and colleagues.” But she has a formula for that, too: “Stick to your guns.”



Products and Markets

Panorama or convertible roofs, heating, cooling or ventilation systems – time and again we set trends with our products – both for manufacturers' equipment and retrofitting. We do this irrespective of whether it involves cars, commercial or specialty vehicles. We think and act as an international network, with an eye on the details and the vehicle as a whole. At the same time, we are responsive – reacting quickly and flexibly to new customer requirements and changes in the markets.



A man with a beard and curly hair, wearing a dark suit and a patterned tie, is seated in the driver's seat of a car. He is looking out the window with a thoughtful expression, his right hand resting on the tan leather door panel. The car's interior is visible, including the tan leather seats and the window frame. The background outside the window shows a modern building with large glass windows.

"In the future, more and more customers will be seeking the extraordinary or unconventional."

Drive the Future

“Think new thoughts” is the leitmotif of University of Munich design professor Dr. Othmar Wickenheiser. When he thinks of the car roof of the future, he predicts that it will conquer the third and fourth dimension. Webasto is certain to have a hand in shaping that future.

Professor Dr. Othmar Wickenheiser is a man focused on lines, forms, and proportions. He sees automobiles as “sculptures,” created to evoke emotions. He approaches the Porsche 911 with long, slow steps. He lets his glance float over the contours of the sports car. His hand caresses the distinctive line of the roof that for decades has characterized the iconic design of the 911 almost unchanged. He slides in behind the wheel and lets the large, transparent panorama roof glide back. “Without the sun there would be no people on this earth, and without light there would not be any happy people,” he remarks.

We invited the design professor from Munich to a discussion of the car roof of the future. And since such an exchange is best conducted with its object close by, the design classic from Zuffenhausen was parked in the courtyard of Webasto headquarters in Stockdorf. Wickenheiser heads the major studies program Transportation Design at the department of design of the University of Munich. It’s a job that requires an inherent passion for all things automotive and knowledge of what is technically feasible. Before he devoted his life to automotive design, the professor studied mechanical and process engineering.

Light in the car brightens up the mood

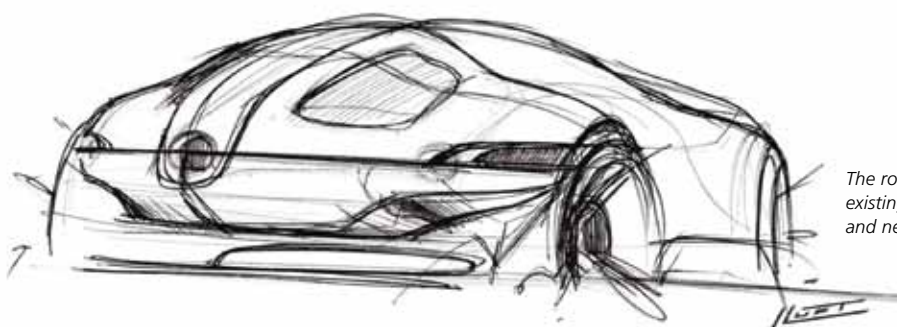
An “opening to the light” in the roof of a car has some unexpected effects. You sit up straighter and your expres-

sion becomes much friendlier. Somehow you feel less constrained, and a great deal closer to nature. “I think my kids are calmer and whine less when they’re ensconced under a panorama roof,” Wickenheiser says. Webasto, the world leader for roof systems, and the University of Munich professor see eye to eye in their conviction that the pleasure aspect of the driving experience will carry far more weight in the future. Things should be fun. Fun is the yardstick for the lives of young people today – in their jobs, their leisure time pursuits, and in their cars. Light and air are guaranteed fun factors and offer a high touch experience. “If I can’t have a convertible, then at least I want to experience the fun of a large sunroof that can be opened,” says the professor, referring to the aspirations of his students.

Seeking creative roof ideas

It was the car roof of the future that brought Webasto and the design expert together. Students working on a study project designed forms and functions for the roof of tomorrow. At present, the front and rear windshields and the exterior roof supports still constitute the natural limits in terms of roof systems. “They are integrated as unobtrusively as possible into the vehicle designers’ visual language, closely following the lines of the car,” says Wickenheiser, with an eye on the Porsche panorama roof that slides over the rear window in a gently tensed arch.

Illustration: Johann Luft



The roof of the future: Previously existing systems limits were breached and new proportions created.



In their joint project, the students thought outside the box as they broke through present day barriers, deliberately forsaking predetermined lines. This allows for the emergence of new proportional relationships that in the future could be definitive for a specific car or vehicle type. “When we presented engineers with a design calling for a roof that opens asymmetrically, a murmur of incredulity swept through the group.” It is likely that there will be a new design identity emanating from the roof that will feature totally new shapes. In addition to asymmetrical shapes, oval roof cutouts in a rather angular shaped car are conceivable; or polygonal, serrated, and even sculptural roof openings.

Beyond that, the students designed innovative light and air intake systems that ranged from adjustable lamellar textures to roof systems featuring irregular patterns of flaps that flip up while the car is in motion, thus initiating a spontaneous pressure cooling effect. This could enable roof systems to overcome the third and fourth dimensions – the latter through targeted movement of the flaps while driving.

The trend toward individuality spurs new design ideas

And what will eventually make it to automotive series production? Professor Wickenheiser is optimistic. “In the future, there will be more and more customers seeking the extraordinary or unconventional. They will want products that are tailored to their exact wishes, with which they can identify to a very high degree. And that will also extend to a projected public image. “Customized ideas” is a well-established concept in fashion design. So why not apply it to the car of the near future?

As the designer imagines it, the variety of roof systems offered for a model range – from the simple and functional to the ostentatiously avant-garde – could take into account the growing demand for ever-greater personalization. Wickenheiser says that “It’s still pie in the sky.” However, he does view such considerations for the future as the consistent further development of what has long since become standard practice in terms of the variety of car body versions offered within vehicle families – sedans, coupés, convertibles, etc. The different front grille designs within a model line, based on purely visual concerns, are already a fact of life in series production.

That leaves the question of acceptance. As a mechanical engineer, Wickenheiser is well aware of the fact that implementing roof systems that defy functional limits requires totally new vehicle concepts. Moreover, in their current configuration, the processes inherent in automotive series production are not conducive to such ideas. On the other hand, exclusive small-volume manufacturers could soon discover creative roof solutions as personalization options for their clientele. The laws of human perception are what spur such visionary concepts. Initially, observers notice the car outline, then its proportions, and only subsequently absorb the shapes. This means that even minute tweaks to the characteristics of the silhouette can result in the creation of a new identity.

Already a leading trend today: light and large roofs

Webasto will be involved in shaping that future. The roof experts in our development studios are working on projects dealing with the future of the automotive roof. Lightweight construction plays an important role in that

future. The company possesses great expertise in this area, including the development and production of roof elements made of polycarbonate, which today is used for panels and fixed roof modules. Above and beyond that, our developers are preoccupied with interesting new features such as the integration of ambient light lighting strips in large-scale panorama roofs, the integration of partially transparent solar cells or switchable glazing.

So the innovative future of the sunroof is bright. The Webasto success story began back in 1937. The first serially produced automobile with an openable sunroof to roll off the production line was a Mercedes 170V. Webasto established the trend toward the large-scale panorama roof around the time of the millennium. Today, the largest representatives of this roof species feature up to 1.4 square meters of transparent roof surface. And the demand for these roofs continues to increase worldwide. Every third car buyer who now decides on a roof module opts for a panorama roof. In the future, auto purchasers may also choose an innovative large-scale folding top or a panorama roof the two panes of which can be opened completely.

Professor Wickenheiser also enjoys the open skies above. The innovative panorama roof based on a lightweight frame is distinguished by high rigidity and a very low profile that allows for maximum headroom. At top speeds of 320 km/h, you can distinctly hear the power of the wind. The roof system of the 911 counters this phenomenon with an unparalleled level of low-noise quality. Professor Wickenheiser isn't looking to hit the road at such high speeds, even though he does indulge in fast driving – if the weather permits it, best of all with the roof open.

“Invigorating, refreshingly cool mountain air shot through with brilliant morning sun, the breath of God’s great nature fans the atmosphere around the joyfully disposed passengers.” These are the words with which Webasto advertised its “limousine sunroofs” as long as 70 years ago. “You really can’t express the feeling more beautifully” – the professor for design lets the roof of the 911 glide closed. He gets out and gently runs his hand over the contours of the roof. Just perfect!

Info

Why Hippocrates would have ordered a sunroof

The ancient Greeks were the first to recognize the powerful benefits of light and sun for mankind. Over 2,000 years ago, Hippocrates observed that the mood and energy of people would be

altered with the changing position of the sun. In his essay “On Airs, Waters and Places,” the most famous doctor of antiquity writes that the inhabitants of sunny regions were endowed with a more

benign character and a clearer voice, and that they were more joyful and less prone to the ravages of disease. A panorama roof in your car allows you to capture a bit of that magic each and every day.



Complex product

A state-of-the-art panorama roof consists up to 75 individual components.

15%

of all cars delivered worldwide are equipped with a sunroof, and a third of those feature a panorama roof.

Brighten Your Mood

Fresh air, blue sky, or a star-studded canopy: Our sunroofs and panorama roofs offer an authentic open-air feeling. There is a global trend toward large-scale panorama roofs – for even more light and an even lighter mood.

A roof that can be opened is the ideal complement to the air-conditioner, as it ensures efficient air circulation in the vehicle's interior. Studies have shown that this primarily benefits the driver. The reason: He or she doesn't tire as quickly and is thus able to drive with improved concentration over longer periods of time. The additional light that a transparent roof brings to the interior also reduces driver fatigue.

Nearly all the cars made by the leading automakers give end users the option of ordering a sunroof or a panorama roof. While the drivers' priorities are generally design

and convenient operation, the manufacturers focus on quality and innovative features.

As a market leading supplier, Webasto was the first to develop the sunroof and the panorama roof and introduce them to the market. As the world's market leader we develop and produce a broad range of products ranging from sliding and spoiler roofs to panorama and solar roofs. All roof types are designed to meet the highest standards of safety, design, and comfort. This is even true in the face of increasing demand for lightweight construction solutions.



The space saver: Upon opening, the spoiler roof slides back over the outside of the roof surface. Embedded in a high-gloss so-called U-shaped panel, the large surface roof fits harmoniously into the vehicle's roof.

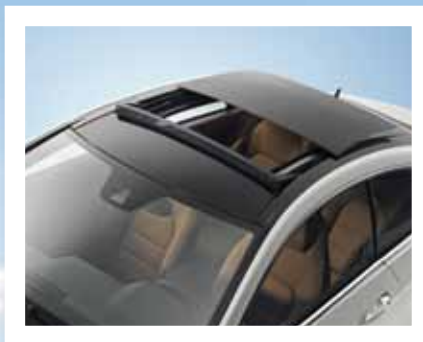
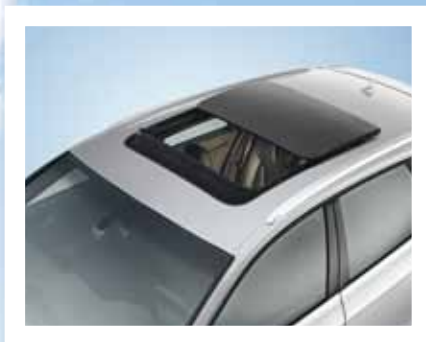
The power players: For over 20 years, Webasto has been manufacturing solar sunroofs. The integrated solar cells generate power that up to now had been used for auxiliary ventilation while the vehicle was parked. This is where visions of the future become reality. Webasto is hard at work on the application of solar technologies for various uses in panorama roofs and roof modules made of polycarbonate.





The classic original: 1956 was the year in which the first sunroof developed by Webasto was installed in series production. A modern sunroof provides fresh air without the disadvantage of draft. Thanks to the glass panel, the vehicle's interior is also lighter and brighter even when the roof is closed.

The stylish ones: The fixed roof surfaces made of glass or polycarbonate constitute attractive elements in roof design. With fluid transitions from the windshield to the rear, they enhance the dynamic and elegant lines of the design. Moreover, the large-scale transparent area creates a bright, open ambience in the vehicle.



The generous ones: In 1994, Webasto launched the first panorama roof on the market: the single or multi-part glass panorama roofs have since become increasingly popular around the world. They all have one thing in common: They provide a lot more light and air – even for the passengers sitting in the back. The development and production of panorama roofs is individually customized for almost all car makers.



Guido Reinking (right) in an expert discussion with Walter Pecho

About the Fun of Sensing the Sky

Guido Reinking has a passion for cars. Not just any cars. He is devoted to roadsters and to enjoying a drive under open skies as often as he can. When he visited the headquarters for convertible roofs, the editor-in-chief of the German industry paper “Automobilwoche” and vintage car driver got a lesson in how modern convertible roofs are created

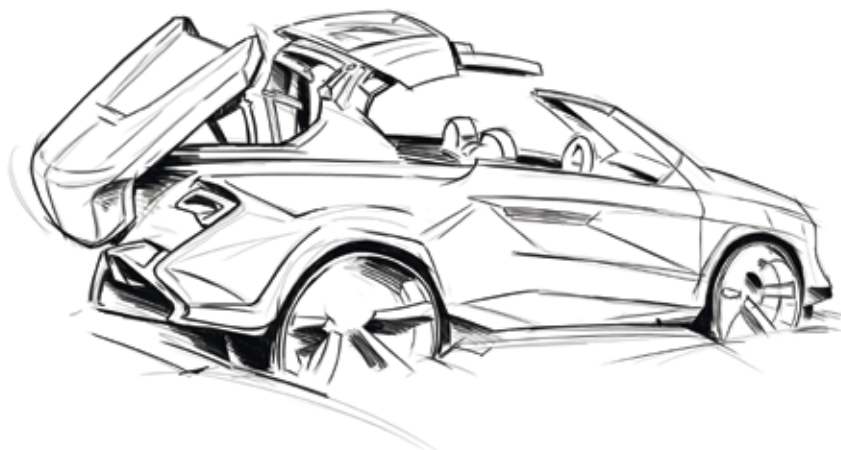
The doors are closed. Yet Guido Reinking stands in front of it, with an interested look on his face. “Top secret,” Walter Pecho explains. Mr. Pecho is the Managing Director of Webasto-Edscha, the business unit for convertible roofs, and responsible for development. He allows his visitor a short glance into the “holiest of holies” of the development department, behind whose closed doors project teams are at work on the convertible roofs for the cars of the future. That’s where the first handmade sample parts and prototypes are kept. Outsiders, even such ardent enthusiasts, are denied a glimpse behind those doors.

But there’s still more than enough to discover here. Since the “Automobilwoche” editor is professionally curious, he has an open ear for the precise description of the developmental steps and the coordination process with customers and suppliers. So he learns that a complex retractable hardtop such as the roof of the VW Eos consists of up to 1,400 individual parts, while a soft top is made up of about 600. He also learns that many a fabric for soft tops costs more than that for a good suit. And that the convertible roof must function perfectly for the entire life span of the car. Collector’s cars such as the Aston Martin V8 Vantage Roadster, Bentley Azure, or the Ferrari California are en-

dowed with Webasto convertible roofs. As a rule splendidly nurtured, they often have very long lives.

The roof must also be capable of coping with uses that are not exactly ordinary. Pecho talks of the prescribed tests in the climate chamber of the development center. Some auto makers demand that it should be possible for a convertible roof to be easily opened and closed even at temperatures of minus 20 degrees Celsius. “Isn’t that over-engineering?” Reinking asks. “I also enjoy open-air driving when the sun isn’t shining. But at minus 20 degrees – who in the world does that?” The Webasto manager knows of just such a case. There’s a Rolls-Royce convertible owner who transports skis in his open vehicle. And he does so in the winter, in St. Moritz, in the Engadine valley. Thus, even in bone-chilling cold, it must be easy to open and close the soft stop of the British luxury sedan costing about 450,000 euros.

Guido Reinking grins when he hears this story – perfectly aware of the feeling of a chilled nose in an open car. Sub-zero temperatures won’t keep any real enthusiast “from the fun of sensing the sky,” as Reinking puts it. His personal passion is for vintage roadsters, and his credo is “they are meant to be driven with the top down.” And immediately



*Perfect contours and roof lines:
Convertible roofs are also design statements.*

adds his personal distinction between roadsters and convertibles. "A convertible is a car you occasionally open. A roadster is one you occasionally close."

Endurance tests with 20,000 closing cycles

The fact that the convertible roofs survive all that is demanded of them in the course of their automotive lives is ensured by quality management. "Every detail is important," Pecho explains, pulling a sewing thread from his pocket. "Even this thread, which we use in our textile sewing center in Slovakia, is covered by our guarantee of lifetime light-resistance." Pecho leads Reinking to the test setups. The convertible roof prototypes go through up to 20,000 opening and closing cycles in endurance test runs. In the climate chamber, this functionality is also tested under extreme temperature conditions. So they actually open and close smoothly and easily even in bone-rattling cold. Quickly doing a rough calculation of the number, Reinking casts a questioning glance at Pecho, wondering, "That would mean opening and closing my top five times each and every day for ten years?" Pecho nods. For him

and the approximately 350 employees in development, prototyping, and testing, customer demands on perfection and precision are their daily business.

Standing at a wall of photos displaying all the vehicles Webasto has outfitted with convertible roofs since 1986, the men talk shop. They discuss the diversity of models, roof design, colors, and materials. Much is possible. And that includes a canary yellow soft top that a customer had made exclusively for his luxury convertible. Today Webasto equips the entire scope of convertibles with its roofs, from the smallest, the smart convertible, to the largest, the exclusive Rolls-Royce Phantom. Then there are the successful high-volume models such as the Golf and the BMW 3-series.

The two quickly progress from discussion of the present to the future. Roofs are taking on an increasing role as a design element. The Mercedes-Benz SLS AMG is a current example. The soft top of the super sports car can even be special-ordered in a textile material interwoven with metallic threads. It is a brilliant piece in the real sense of the word.





Technical concepts and details are evaluated by means of three-dimensional simulation models.

“What will we be seeing in convertible roofs ten years from now?” Reinking would like to know. Pecho is succinct: “More color and less weight.” He describes the options, especially with regard to soft tops, of delivering far more customer-specific designs, for instance, fabrics in different patterns. He also talks about developments involving LED and fiberglass films that can generate individual lighting motifs in the roof liner. It is absolutely conceivable that one day a retractable hardtop roof will feature a light-suffused interior roof liner in a closed vehicle.

Lightweight construction – a key issue of the future

But then he quickly moves to the subject that the development engineers are working on intensively (in addition to all the wonderful visual options): lightweight construction. This is an area that is constantly engaged in a balancing act between what is technically feasible and what is economically reasonable. Complex functionality and requirements for the highest quality must be reconciled with one of the greatest challenges facing the automotive industry – reducing weight.

At the so-called holodeck, Pecho uses a three-dimensional simulation model to once again vividly articulate the problems concerning weight. For the Z-fold of the soft top, such as is implemented for the Audi A3 or Audi TT, the trunk lid becomes superfluous, as the front roof bow takes over this function. For fully automated roofs, there is a trend toward electric drives. They can be variably controlled by the control unit, the installation of hydraulic lines is no longer necessary, and they do not take up as much space in the so-called package. In more and more instances, they are replacing the conventional hydraulic systems used to date.

Overall, the share of weight-optimized components made of aluminum, magnesium, or the latest composite

materials is continuously on the rise. It is the sum of many individual solutions and a combination thereof that is producing progress in lightweight construction. During a tour of the production department, Pecho illustrates several lightweight construction solutions that have already found their way into series production. They include, for example, elements of the top made of lightweight fiber composite material, rod assemblies of magnesium or aluminum components, or reduced-weight joints and fastening parts.

The RHT roofs are also being manufactured of weight-optimized steel or aluminum, while fiber-reinforced plastics are already being utilized. In the early 1990's, the multipart hinged roofs were considered a revolutionary development, with Webasto significantly involved in its design. 1993 marked the first time that Webasto presented an RHT in the context of a vehicle study. In 2002 it went into series production: in the Daihatsu Copen. Today, its most popular protagonists are the BMW 3-series BMW Z4, Renault Wind, Volvo C70, and the VW Eos. But nowadays even purebred sports cars such as the Ferrari California cut an impressive figure with this roof version.

“A convertible is a car you occasionally open. A roadster is one you occasionally close”.

Guido Reinking admires the “refined handicraft” that is a hallmark of the creation of the convertible roofs that are in part very exclusive. Depending on the size and configuration, experienced employees work up to five hours on the assembly of a convertible roof. The editor-in-chief of “Automobilwoche” runs his hands over the hand-sewn fabric roofs, has employees explain individual work sequences, and discusses the complexity of the systems with head developer Pecho. Again and again, the employees open and close a single roof to inspect its functionality. “Incredibly perfect,” is Reinking’s comment on the precisely coordinated interaction of the many individual components.

Then, at a Maserati roof, the passionate roadster enthusiast does become something of a convertible fan. “The roof defines a beautiful, coupé-like roof line. The car is enhanced by this roof,” says Reinking, lauding the design and explicitly also the “perfection of its execution.”

Let the Sun Shine in

A ride in a convertible is a feast for the senses. Whether it's a soft top or retractable hardtop, Webasto develops and manufactures customized convertible roofs for cars that are preferably driven "roofless".

Today's convertibles are actually sedans with an extra kick of adventure: safe, comfortable, and endowed with the sunny mood effect that takes hold when the roof opens at the touch of a button. Millions of people worldwide indulge in the pleasure of cruising under open skies. For over 25 years the world market leader, Webasto-Edscha, the convertible business unit of the Webasto Group, has been developing and manufacturing convertible roofs for nearly all automakers.

This is a story of great technological evolution – and real revolution: retractable hardtops (RHT), as they are known in

the industry. They hit the streets for the first time in 2002 and launched a new vehicle segment.

Equally popular, the classic fabric soft top will grace many convertibles and roadsters in the future – also due to issues of space. As compared to the retractable hardtop, the stowage space for the lowered soft top can be designed so it is more compact and versatile. And in terms of comfort and safety, today it is just as good as a hardtop sedan.



Purist: When you open the soft top, it is lowered in Z-folds and comes to rest flat behind the seats and the rollover bar. Thanks to the upward-directed exterior skin, no additional cover is needed. It consists of durable, all-weather three-layer textile material suited for year-round use.

Pace-setter: It takes all of 9.5 seconds for the fully automated tension bow roof with a Z-fold to open up to the sky above, and it can be done at driving speeds of up to 30 km/h. Not many are faster. Moreover, a special insulation optimizes the acoustic properties of the roof.





Elegant perfection: With a length of 4.88 meters, the open four-seater is one of the longest cars in its segment. The very light roof construction hardly weighs more than that of the coupé and with a press of a button can be retracted fully automatically at speeds of up to 30 km/h.


Extra serving of light: The five-piece RHT, the only one with an integrated glass sliding roof, is one of the most interesting convertibles in existence. When closed, the spacious glass sunroof admits a great deal of light into the interior. Extending across the entire width of the roof, it can also be opened while driving.



Perfect duet: The two-part retractable hardtop with an aluminum shell design sets standards both acoustically and aerodynamically even on high-speed drives – at speeds of up to 270 km/h. The two roof elements fit into the roof storage compartment, enabling the roadster's slim rear design to be preserved.

Elegant design: The two-part RHT dovetails gracefully into the silhouette of the vehicle. The aluminum RHT is a true lightweight, opening and closing at a top speed of 14 seconds.





*He needs to keep cool in his
workplace: Professional truck driver
Uwe Renger covers more than
120,000 kilometers in a year.*

*"The parking heater and especially the parking cooler
help me do my job better and stay healthy."*

Safety on the Road

When you have a sense of well-being while driving, your concentration improves so you drive more safely. Uwe Rengier is a professional driver. His workplace is on the road, and the weather is his constant companion. Webasto parking heaters and parking coolers ensure that his workplace has the perfect climate.

For years now, the name Webasto has been synonymous with premium parking heaters for cars and trucks, and recently also with parking coolers for trucks. Webasto develops heating and cooling systems tailored to customer and market needs, both for new systems and retrofitting.

Starting work without scraping and freezing

It's 4 a.m. On a freezing-cold winter's day. Another ordinary workday begins for Uwe Rengier. With his 40-ton truck he delivers sand, cement, plaster and, in the winter, road salt to construction sites and maintenance depots. When he arrives at his truck early in the morning, the windowpanes are free of ice and his workplace at the steering wheel is pleasantly warm, thanks to a programmable parking heater. Thus, he can start work feeling safe and relaxed. And when he's waiting at a construction site, the parking heater ensures that the temperature in the cabin is 20 degrees Celsius without the engine running.

Keeping a cool head on hot days

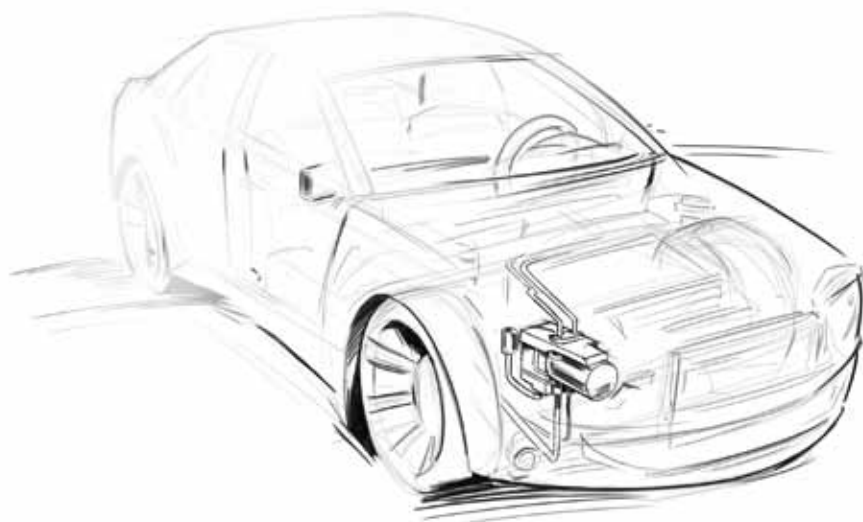
Today, we are accompanying Uwe Rengier on a tour during the summer. Rengier will drive to four different construction sites. He has around 500 kilometers ahead of him, will unload the truck four times, and at the end of the day will go back to reload it for the next day's drive.

It's noon. There's not a cloud in the sky and it's hot. Uwe Rengier maneuvers his truck through the narrow entrance-way to the construction site. Once he's assigned his waiting position he turns the engine off and activates his parking cooler. "Heat is what bothers us most," he says. "Without air-conditioning, the cabin temperature can reach temperatures of 50 degrees Celsius in the summer." But he's cool about that – in the true sense of the word. Why? Because in addition to its air-conditioning system, his truck has an electric parking cooler which cools the cabin during waiting times and breaks.

Many of the other trailer trucks are waiting in line with their engines running. "I totally understand my colleagues. If they turn the engine off they also shut off the air-conditioner. Then it quickly gets unbearably hot in the cab." The stop at this construction site takes an hour. The parking cooler maintains the temperature in the cabin at a constant 20 degrees Celsius. A temperature that has been scientifically proven to be the optimum temperature in a workplace where a high level of concentration is a must.

A parking cooler for added comfort

The Cool Top Vario rooftop air-conditioning system is provided with electricity by the car battery. It works when the



Factory-installed or retrofitted parking heaters permit an unobstructed view and provide for a pleasantly pre-heated interior.



A clever solution: The parking heater can be operated and programmed via a Smartphone.



At the press of a button, a perfect climate for optimal work conditions.

engine is shut off, saving fuel and reducing CO₂ emissions. The interior is cooled and the humidity regulated, which significantly contributes to a better climate in the cabin. The operating panel is on the roof liner, affording the driver a view of all of the functions at all times. Uwe Rengier usually controls the temperature, fan, and operating mode with the remote-control unit, which he always puts next to the steering wheel. When he switches on the parking cooler, pleasantly cool air can be felt in no time. A special comfort airflow with adjustable nozzles distributes the outflowing air into the interior draft free. In addition, the system is very quiet.

A good climate has even more advantages

Uwe Rengier covers an average of 120,000 kilometers in a year. He is a seasoned, calm driver. Safety is his top priority. For several years he was also en route on multi-day international routes. On these runs, drivers generally spend the legally prescribed rest times of up to eleven hours in the driver's cab. Rengier knows his colleagues' worries. "Without the parking cooler, the breaks are often a torture on hot days. Shady areas on highway parking lots are almost nonexistent. Many colleagues keep the engine running to keep the air-conditioner operational."

The idling engine of a truck consumes an average of five liters per hour. A parking cooler independent of the engine cooler – supplementing a parking heater in the wintertime – is the perfect solution. It enables the driver to spend quiet, restful hours in the cabin. Opening the windows or doors to air out the truck is not an option, particularly at night when the risk of burglary and theft is high. "And the noise of the idling engines in the parking areas really gets on your nerves," says Rengier.

While parking heaters in trucks are commonplace in many countries, drivers and fleet operators have just become aware of electric parking coolers, for ecological and economical reasons. Running a several hundred HP-strong truck engine to afford the driver comfortable rest periods is completely misguided both from an environmental and a financial perspective. Fleet operators stand to derive a double benefit from parking heaters and parking coolers installed in their vehicles. A well-rested driver is more concentrated on his driving, which is therefore safer. In addition, by avoiding unnecessary idling, fuel costs can be cut and the life of the engine and other equipment can be prolonged. "

It is now evening. Rengier approaches his last stop of the day, where he will load the truck for the next day. The passionate motor biker can't wait to get home. With the nice weather, a spin on his motorcycle would be the perfect thing to do after work. Before he goes, he tells us: "The parking heater and especially the parking cooler help me do my job better and stay healthy." And he wants to stay fit – for many more accident-free miles behind the wheel of his truck and invigorating rides on his motorcycle.

"It's a shame that there are no air-conditioners yet for the helmets," he says with a grin as he climbs on to the driver's seat and once again starts the engine of his 440 hp truck with a roar. Only a few miles separate him from pleasure on two wheels.

"Have a good trip!"

The corporate division Thermo & Comfort at a glance

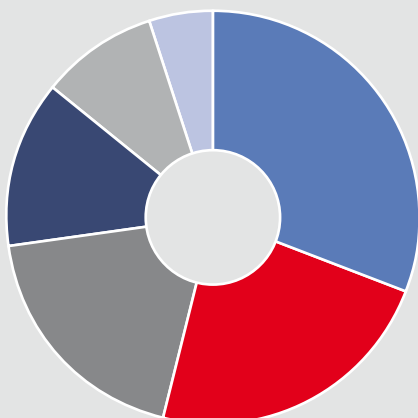


“When the engine is pre-heated by a parking heater, the cold-running phase is reduced and so fewer harmful substances are emitted.”

Klaus Reindl, ADAC

Share of sales by market segment

Parking heaters and auxiliary heaters for cars make up the largest business segment. The commercial vehicles sector is dominated by engine-independent parking heaters. These systems are offered both as standard original equipment (OE) and for retrofitting in the aftermarket (AM).



- Car OE
- Car AM
- Commercial vehicles AM
- Specialty vehicles
- Truck OE
- Marine & Recreational Vehicles (RV)

Heating & cooling from a single source

There are two product families in the parking heater range:

- **Water heaters** in the Thermo product family (heating output: 4 to 40 kilowatt) ensure optimal temperatures in cars and commercial vehicles – from light-duty to heavy-weight specialty vehicles
- **Air heaters** in the Air Top product family (heating output: 2 to 22 kilowatt) are employed for heating construction equipment as well as light- and heavy-duty commercial vehicles, where they also heat the cargo space.

Moreover, Webasto is consistently expanding its range of air-conditioners for utility and specialty vehicles as well as mini and midi buses:

- The **electric retrofit parking cooler** Cool Top Vario features a cooling output of 1,000 watts, making it the most powerful device of its type on the market. It circulates up to 500 cubic metres of air per hour in the driver's cab. The compact system weighs only 31 kilograms.
- Since May 2012, the product portfolio has included the Diavia **rooftop and integrated air-conditioners** and **refrigeration units** for light-duty commercial vehicles, mini and midi buses as well as specialty vehicles.
- An additional option is provided by the Accusphere II **cold storage solution** for serial installation in commercial vehicles. It complies with stringent environmental regulations and is integrated into the vehicle's own HVAC (Heating, Ventilating and Air Conditioning).

A truck consumes up to **3 liters** of fuel when the engine is idling, which can be saved with our parking heater and climate systems.

Competence in Creating an Atmosphere of Well-being

Having a pleasant atmosphere in your vehicle is more than just a question of comfort. Whether in a car, an RV or a truck, down on the seven seas or up in the lofty heights of a crane operator's cabin, one rule remains the same: A person is safest when driving or working at 20 degrees Celsius. Webasto has the innovative and efficient solutions that ensure that extra margin of safety.

The Thermo & Comfort division develops and manufactures complete heating, cooling, and ventilation systems for all types of vehicles. Approximately one third of our products are supplied directly to makers of cars and commercial vehicles. The largest market for these products is Germany, followed by Russia.

Main products are parking and auxiliary heaters, as well as air-conditioning systems for commercial and specialty vehicles. By acquiring Diavia's air-conditioning range, the focus is now also on mini and midi buses, ambulances, as well as agricultural, construction and specialty vehicles.



Marine

The name Webasto is synonymous with innovation. And that applies on the water as well as on land. The company provides its customers with complete climate solutions for heating and cooling, along with roof systems – all from a single source. It has a unique position on the marine market.



Cars

Webasto is the market leader for car parking heaters and auxiliary heaters. All the renowned auto makers as well as ultimate customers in all of the cold climate zones in the world rely on Webasto for original equipment, series production, and aftermarket business.

Recreational vehicles (RV)

The demand for comfort solutions in RV's is about coming up with solutions that foster increased independence on vacation. That is why our air and water heaters, space heating systems, and cookers invariably use diesel as their source of energy.



Trucks

Webasto enjoys an outstanding reputation in the commercial vehicles industry. The issue of fuel reduction poses a challenge to the industry. Innovative thermo-management enhances comfort, safety, and efficiency.





Specialty vehicles

One hundred years' experience with thermo products enables sophisticated, well-engineered solutions for any and every purpose. Webasto offers comprehensive know-how in specialty vehicle construction from new developments to low-volume series maturity.



Defense

Defense vehicles must function perfectly all over the world, even under the most extreme climate conditions. To fulfill this requirement, Webasto offers proven and yet customized heating and air-conditioning solutions.



Commercial vehicles / Off-road

Webasto solutions allow construction and agricultural equipment to defy heat and cold. Innovative gas solutions combine comfort with efficiency. Engine-off technologies for parking heaters and air-conditioning units prevent costly engine idling.



Rail

More and more comfort on rails: From electric and diesel rail cars to passenger coaches and even subways – Webasto applies a modular approach in the development of solutions customized for the individual requirements of all types of rail vehicles.



Bus

Heating and air-conditioning units for buses provide drivers and passengers with the optimum in comfort and safety. The implications for the bus operator are effective vehicle performance and a worldwide service network.





Technologies for Tomorrow

Our development is focused on electro mobility and lightweight construction. Hybrid and electric vehicles will contribute to shaping the mobility of tomorrow. With our high performance heaters, we are able to ensure comfort and safety.

Lightweight construction enhances efficiency – for both conventional and electric vehicles. Thus, for example, an electric vehicle of the future could have a lightweight synthetic roof with solar cells to help charge the battery.

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Act Today to Secure Tomorrow

Alternative drives and more stringent environmental laws are revolutionizing the automotive world. This will open up new markets and customers for the Webasto division Thermo & Comfort, explains Dr. Joachim Damasky, the Management Board member responsible for this division.

What is the significance of the automotive world of tomorrow for this division?

As the market leader, we aspire to always develop the best products for our customers. To us this means that we are continuing to optimize our fuel-powered parking heaters and auxiliary heaters. We do this in terms of consumption and emission aspects, weight reduction, as well as the extension of the heaters' service life. Then there's the question of how vehicles with electric drives – whether they are hybrids or purely electric vehicles – can be effectively and efficiently heated. Since the engines of hybrid or electric vehicles do not give off sufficient exhaust heat for heating, alternative heating concepts are required to tackle this issue. Moreover, the energy produced by the battery in electric vehicles should primarily be applied to mobility, with minimal impact on range.

What exactly does this mean for Webasto as a specialist for heating systems?

We offer various future-oriented heating systems. Our conventional, fuel-powered parking heaters can also be operated in CO₂-neutral mode, with bioethanol, for example.

What's more, we have introduced a totally new type of heating system for hybrids and electric vehicles with which we will be entering the electrical heating segment for the very first time. We have developed a high voltage heater. It is a high-efficiency, electrically operated heater for hybrids and electric vehicles. This allows for pre-conditioning the vehicle when it is charging and heating the interior during the drive. For heating is not just a matter of comfort, but is about safety above all. Efficient heating solutions thaw ice-covered windows, prevent them from fogging up while driving, and thus guarantee unobstructed visibility. Our broad-based product range now enables us to provide our customers with heating systems for all drive concepts.

From your perspective, how sustainable is the trend toward electromobility?

Especially in heavily populated urban areas there is a growing demand for vehicles that generate less noise and exhaust fumes. The catchphrase here is "zero emissions". So it is obvious that the trend toward electrification of vehicles will be unstoppable. The automotive industry is thus confronted with one of the greatest technological challenges in its history to date.



"We view ourselves as our customers' technology partners," says Dr. Joachim Damasky in conversation with employees.

"Our strength is our technological expertise that extends well beyond our own value chain."

Will this change your cooperation with the manufacturers?

The array of issues we are involved in is expanding. Let me illustrate that in terms of an example. In conventionally powered vehicles, one water circuit is generally sufficient. In electric vehicles we are dealing with multiple, diverse-temperature cooling circuits, where each is equipped with its own temperature management for the various applications such as cooling the battery, heating the interior, and de-icing the windows. This kind of complexity poses challenges for auto makers. That is where, as thermo specialists, we play a key supporting role.

"In China, we are looking to grow considerably over the next ten years."

What trends are you seeing in the commercial vehicles segment?

Here too, it is primarily about reducing fuel consumption. Therefore, there is an increasing focus on avoiding engine idling for all types of commercial vehicles. Studies have shown that the engines of construction equipment, for example, operate in idling mode for up to 60 percent of the day, among other things to ensure that the climate in these machines is one that enhances their operators'

performance. During this time, the diesel engines of these vehicles consume around three liters of fuel per hour. Our parking coolers and parking heaters operate independently of the engine, avoid idling and thus significantly improve the cost-efficiency of the equipment.

Parking heaters enjoy broad-based popularity in Europe and Russia. Are "new" auto markets such as China following suit?

In northern China, winters are long and brutally cold. Engine-independent parking heaters are the ideal product for this region. However, there is little or no awareness of the fact that parking heaters even exist. Up to now, the common practice is to have cars parked in front of the house running to warm them up or even to rent a heated garage just for the cold period. We have opened our first flagship store in Changchun, where we advise interested drivers on cars and commercial vehicles, dealers and fleet clients. In China we are the pioneers, and we are redefining this market.

What timeframes do you contemplate for such a market development?

In China, we now offer parking heaters as retrofit solutions for cars and commercial vehicles. We have also been working directly with Chinese and Western auto makers for some time now. The premium segment is precisely where we are seeing increasing interest. Russia, for example, has



“We aim to also become the market leader for heating in electric vehicles, and are well-positioned to achieve this with our high voltage heater.”

developed into our largest foreign market for parking heaters within a ten-year-period.

How are you positioning your corporate division for the future?

Globalization is having an increasingly powerful impact in shaping our internal interaction. We think globally, are on the move worldwide, always positioned as close as possible to our customers. Our global business focus is reflected not only in how we are structured, but also in our product concepts. Intelligent modular systems enable us to provide customized solutions for customers with widely differing requirements.

Where do you see the outstanding strength of Webasto in the Thermo segment?

Our strength lies in our technological expertise that extends well beyond our own value chain. Success comes only to those who have detailed knowledge and intimate understanding of all the processes along this chain. That is also why we are continuously upgrading our know-how with regard to purchased parts. More often than not we collaborate with our suppliers on the development of crucial components – in accordance with our own specifications and requirements.

Does that mean that going forward you will be developing and producing more than before?

A larger proportion of in-house production and thus greater value creation are meaningful if this enables us to become less dependent on suppliers for key technologies. Should we come to the conclusion that this is so, we will develop and manufacture more parts and components.

How does your development accommodate the increasing complexity of products?

Very early on we abolished the separation of mechanics, electronics, and software in development. Experts in the different specialty fields work together very closely from the initial stages of development projects. Therefore, today a large share of our value creation is already derived from the development and delivery of electronics hardware and software.

The control concepts of the future, whether via apps or voice commands, also further raise the bar in terms of the demands made on us in our role as technology partners. Stringent functional thinking and a high degree of integration of mechanics and electronics are the building blocks for our future success.

How would you define a perfect product?

Superior workmanship, outstanding functionality, lightweight and compact construction, as well as zero defects over the entire lifecycle of the vehicle. The customer should never even have to give any thought to the heating or air-conditioning in his or her vehicle.

Is growth through acquisition an option?

In 2012 we incorporated the northern Italian Diavia air-conditioning business for off-road and specialty vehicles into the Webasto Group. Thereby, we significantly expanded both our product range and our global footprint in terms of air-conditioning solutions for these specialty vehicle segments. It is our aim to be one of the world's leading systems providers for heating and air-conditioning products from a single source. Therefore, additional acquisitions that take us closer to this goal are conceivable.

The New Lightness of Being

“The lighter, the better.” In current automotive engineering every gram counts. To this end, Webasto’s corporate division for roof systems is developing future-oriented concepts using various lightweight materials.



Every gram counts in the struggle to achieve lower fuel consumption and to implement global demand for reduced emissions. A great deal is technically feasible, but much of this is still too costly to be applied in automotive manufacturing. Nonetheless, clients are intensifying their quest for lightweight solutions. Titanium or magnesium, but also carbon fiber composite materials offer what lightweight experts dream of: extremely low weight paired with ultra-high rigidity. The Webasto developers are aware

of the challenges and are addressing them. Is the dream of the automotive super lightweight still a remote fantasy of the future?

A sunroof featuring many lightweight details

On the contrary, day by day we are getting a bit closer to making it a reality, because at Webasto we dare to take on dreams. Based on a lightweight construction study of a panorama roof, a development team explored the options

Exciting: Harmonizing what is technically possible with what is economically reasonable.



Webasto Glas ProTec® is thin and light: In the clean room process, a highly tear-resistant PET film is applied to thin sheets of glass.

of technical feasibility. The study was preceded by a systematic analysis and evaluation of all conceivable lightweight potential. Thereby our experts dealt with each and every individual component, from the glass cover and the frame to the drive and mechanics. Discussing and deciding on alternative materials, they also considered new functional weight-saving solutions. The study indicates that cutting weight in half is technically feasible, but is contingent on high-priced individual components. And yet, it is certainly not just dreams of the future that are

playing out here. Some of the individual components in the lightweight study will find their way into serial production and contribute to weight reduction. The exciting thing about these developments is harmonizing that which is technically viable with what is economically reasonable.

Webasto works closely with automotive industry customers on all of these developments. The installation of a panorama or sunroof affects the rigidity of the auto body and thus ultimately impacts the vehicle's handling characteristics. Therefore, contributing to the weight reduction of the entire vehicle has implications for the roof specialists: leave no stone unturned! Taken together, many small steps are the cumulative drivers of progress, such as using a lightweight plastic frame, partially reinforced with steel elements, for sunroofs. This makes them up to 50 percent lighter than the conventional steel frame.

Concentration of know-how for new materials

Webasto has always been imbued with a pioneering spirit. A good example of this is the company's own plastics competence center at the Schierling plant near Regensburg. All the polycarbonate roof elements are manufactured on three production facilities at this site, so that the company has the edge as a leading provider in this field. With half the density as compared to glass, polycarbonate allows for weight savings of up to 50 percent. The groundbreaking lightweight developments by Webasto



A patented perforation of the film in Webasto Glas ProTec® ensures the fixation of the glass within the roof system.



Concentrated expertise: All polycarbonate roof elements are produced in the plastics competence center in Schierling near Regensburg.

include polycarbonate roofs such as the roof of the smartfortwo. Given its size of about 1.2 square meters, it is the world's largest fixed vehicle roof made of polycarbonate to date. Additionally, the lightweight and highly impact-resistant material is used to produce "glass look" panels that form a smooth, uniform transition from the windshield to the panorama roof. What's more, fixed side windows with an integrated border are planned.

A rule of thumb says:

**100 kilos of weight savings
reduces a car's fuel consumption
by 0.3 to 0.4 liters.**

"Lightness" also comes in different varieties. That's why Webasto additionally applies other lightweight technologies, as evidenced by our proprietary product development, "Webasto Glas ProTec®": A safety glazing whereby thin and thus lightweight glass panes are laminated with a special PET film (polyethyleneterephthalate). Above and beyond that, Webasto Glas ProTec® offers the option to integrate diverse functions. Thus, if the customer so desires, the laminate films can be tinted and the translucence may be selected. Using a special lamination the film can, for example, reflect infrared rays (heat radiation), and thus prevent the vehicle from heating up.

Another area of interest is PU composite materials. They are essential elements in lightweight compositions, for example in the roof shells of retractable hardtops. In addition to a 25 percent weight reduction as compared to steel, these material types are characterized by exceptional 3D malleability and excellent acoustic and heat insulation properties. Last but not least, a super-light lightweight paper honeycomb material now benefits lightweight roof systems. Modeled on bees and their hives, it is extrusion coated with polyurethane and thus utilized as a material in sunroof liners.

Solar cells for power generation

The electromobility of tomorrow is challenging the technological creativity of our developers today. Thus, solar cells can now be integrated into roof surfaces for the purpose of generating energy. It is a topic of significance regarding the suitability of electrically powered vehicles for everyday use. Here, new technology perspectives engender new opportunities, such as organic thin-film solar cells that combine transparency and power generation. Thanks to the thin-film technology, they can be easily integrated into curved surfaces. The efficacy of a solar cell-equipped roof surface suffices for the operation of the radio, the telephone, or the air-conditioner fan. The new lightness is definitely multifaceted.

When a Bavarian company
becomes a global player in
the automotive industry.
That's what means Feel the Drive.

1901

Wilhelm Baier founds the Essling
Wire and Ironworks Factory

1935

Introduction of
the first fresh-air heater
for water-cooled
engines

1974

The first international
location is opened
in the USA

1956

Market innovation:
Production of the
first steel sliding roof
for cars

1961

Introduction of the
first engine-independent
parking heater for cars

1937

The first series production
order for a folding roof

1908

Move to Stockdorf and launch
of Webasto as the company name

1978

The first Asian
location opens
in Japan

As of 2013

1994

Trendsetter: The first panorama roof goes into production

2007

Start of production of the world's largest polycarbonate roof element

2012

Product innovation: High voltage heater (HVH) for vehicles with alternative drives

Advancement of market leader position and Hidden Champion through

- Profitable growth and acquisitions
- Development of new technologies for mobility with new types of drive

1989

First glass sunroof with integrated solar cells for auxiliary ventilation

2001

Entry into the Chinese market

2011

25 years of convertible roofs with over 45 convertible models equipped



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