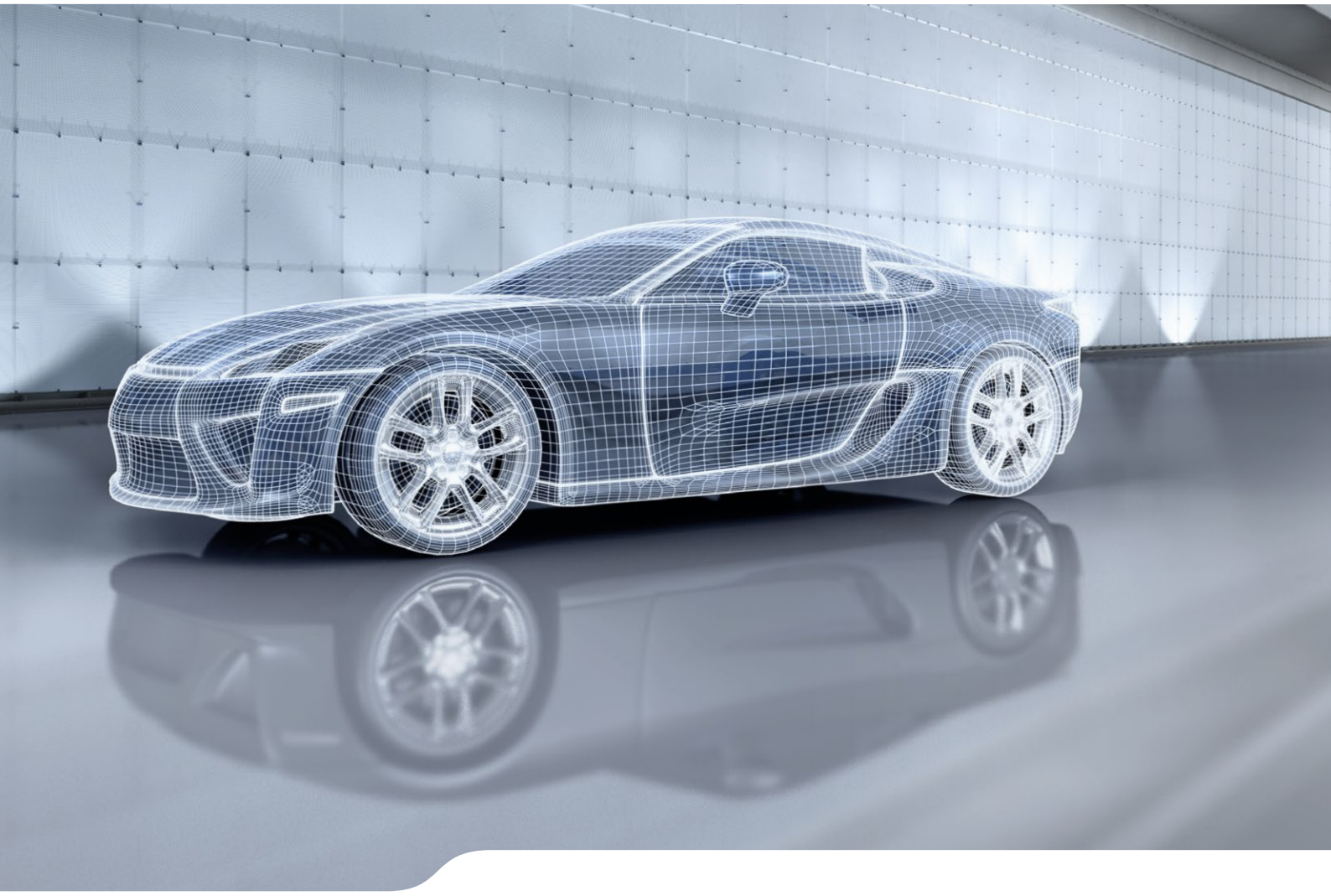
FORMING THE FUTURE



LIGHTWEIGHT TECHNOLOGIES FROM SCHULER

SCHULER

Member of the ANDRITZ GROUP

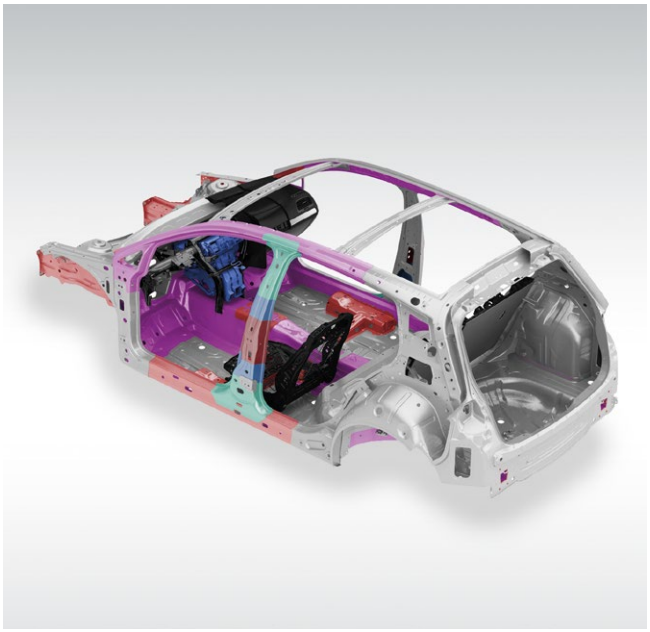
THE FUTURE IS LIGHT.

ECONOMIC AND RELIABLE PRODUCTION SOLUTIONS FOR HIGH-VOLUME MANUFACTURING.

Hot Stamping in series production with PCH Technology.

While it is technically feasible to build a light and safe car, manufacturing costs are often the deciding factor. In the past, there have been fairly light and low-consumption car models produced, but their costs were too expensive and did not attract enough buyers. As while there is a need for different concepts for fulfilling the requirements of individual vehicle platforms, there cannot be one basic approach to achieving greater efficiency. Cost and performance can be optimized by integrating various processes and materials. Each material has specific benefits and is therefore suited to different installation areas of the car.

Lightweight technologies from Schuler. We are the only manufacturer in the world to offer press systems for all manufacturing processes in the area of this demanding technology: Cold forming of high-strength steels, pressure-controlled hardening, hydroforming, plastic forming and aluminum forming. In close cooperation with our partners, we achieve economic and reliable production solutions for high volume manufacturing.



Lightweight technologies from Schuler deliver a synergy. The coming generation of cars will not only be lighter, but also safer and more environmentally friendly.

DIGITAL SUITE – DIGITALIZATION IN THE PRESS SHOP

With its Digital Suite, Schuler offers you new opportunities to boost the productivity of your press shop. From the networking of your systems and die protection to component tracking and production monitoring.

Embark on the path to digitalization with Schuler. Reliable, uncomplicated, and customized to your individual needs.

digital@schulergroup.com

MORE INFORMATION

https://digitalsuite.schulergroup.com/en/

NEW PERSPECTIVES.
COLD FORMING HIGH-STRENGTH STEELS.

When utilizing modern lightweight construction strategies, using high-strength steels improves the relationship between component weight and function.

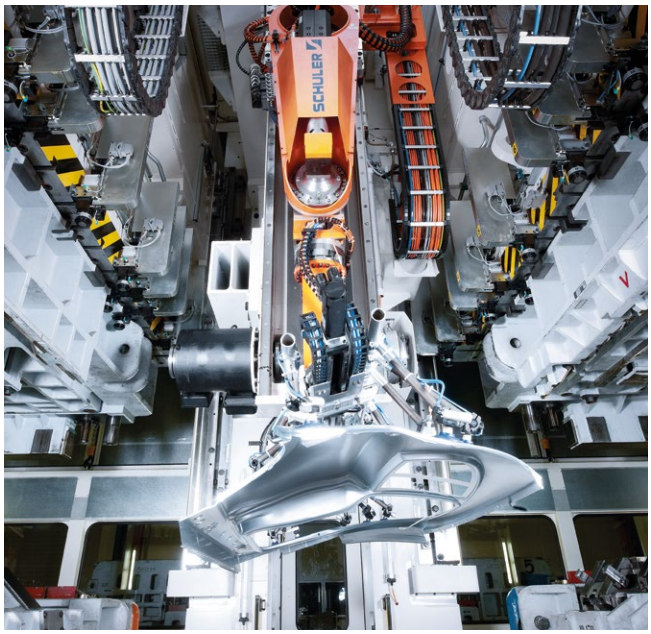
Servo presses in tie rod construction with destacker/coil line combination for manufacturing high-strength structural components.

Leading technologies. The market launch of Schuler ServoDirect Technology is now opening entirely new perspectives for cold forming of high-strength steels. Whether on a press line, blanking or cut-to-length line, transfer or progdie press – many advantages are proven: maximum flexibility in production, economical production of complex part geometries and high productivity with optimum part quality.

Efficient production of light parts. High strength steels are a key part of today's innovative lightweight vehicle design and the applications for high volume production are forecasted to increase in the coming years. It is possible to achieve further reductions in sheet thicknesses by using new, high and extra high-strength steels while maintaining the same component properties. This means lighter weight with the same performance.

ServoDirect Technology is pointing the way to the future. The servo press lines are characterized by maximum flexibility, high output and short die change times. The slide movement of each press can be individually adapted for each component's specific forming process, die and automation. This offers new possibilities for cold forming high-strength steels.

New processes – new possibilities. Using the advantages of ServoDirect Technology, Schuler is developing new production concepts for manufacturing lighter components. For example, interdisciplinary teams are looking into the possibility of integrating follow-on processes or adopting new approaches for manufacturing hybrid components. The objective is to develop new production processes that can meet all the requirements of high volume production despite the conflicting objectives of reduced component weight, efficient production and high safety requirements.

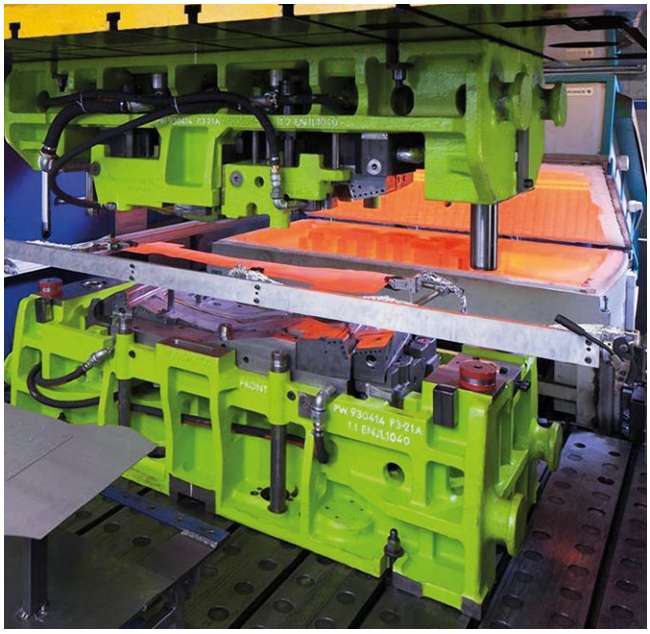


Servo press lines for processing sheet steel, high-strength steels and aluminum.

Know-how and hands-on experience. The Schuler Academy offers numerous training courses for presses and automation equipment around the world. www.schulergroup.com/academy

NEW TAILOR-MADE SOLUTIONS.
HOT STAMPING WITH PCH TECHNOLOGY.

In the area of hot stamping, Schuler's innovative PCH Technology stands for new custom solutions in press and automation technology.



Automated tryout cell for die hardening process installed at Schuler Göppingen.

Developed by Schuler, the hot stamping process can be controlled even more reliably to consistently produce the required final high-strength material properties, ensuring the expected quality and performance of the final component. At the same time, it delivers an unparalleled production efficiency in terms of speed and parts output.

Pressure Controlled Hardening (PCH) is a comprehensive system for manufacturing die-hardened components. The advantages of this process are the ability to control the forming and cooling procedure during the die-hardening process with pressure controlled hardening. The new press technology has a cushion system that provides controlled and even contact pressure in the die, making it possible to achieve unmatched, consistent component quality. The end result is that the component can achieve even higher rigidity, and in the example of certain structural body components, it can improve crash properties. The benefit to auto manufacturing and design is the higher strength of the components with simultaneous reduced weight.

Hot Stamping line PCH Hardline Multi.

Optimizing the output by four-out parts production.

Efficiency is an important argument in any process. Here too, Schuler scores points with its PCH. The process makes it possible to achieve faster production of a larger number of parts. Shorter cooling times, high-speed transfer automation and innovative die solutions make it possible to double the previously achieved output. The list of economic advantages is topped off by significantly lower die costs.

The procedure is very economical and energy-saving in manufacturing as well. The material used is less expensive than high-strength steel and can be processed with lower press forces. This type of production means that entirely new possibilities are available for component design.

MANY POSSIBILITIES.
FULL SPECTRUM HYDROFORMING.

Tubular hydroforming offers a wide variety of opportunities for innovative lightweight designs. Schuler is setting new standards in high volume production of vehicle components with its advanced global hydroforming approach.

Automated hydroforming line.

For a wide range of parts. While used predominantly in exhaust and engine cradle applications in the past, hydroforming is quickly gaining acceptance for high performance and weight reduction in structural chassis components as well.

Safe and reliable. Tubular hydrofoming is used to form exhaust, chassis and structural components. By standardizing the part design, forming processes and die design for a global platform, the final die can run on the majority of hydroforming systems around the world. This not only saves in die development costs, but also provides greater flexibility for production and opens new opportunities to support cost effective lightweight automobile production. The process of hydroforming under supporting pressure also allows the use of high-strength steels.

HYDROFORMING TECHCENTER CANTON, MI USA

Schuler does not only offer its customers experience in hydroforming processes, toolmaking and component design, but we also have expertise in part production and materials handling. At our plant in Canton, Michigan – USA, Schuler operates a 3,500 ton and 8,500 ton hydroforming press in production. Here, it is possible to carry out small-batch production, prototyping and also provide high volume production backup for Schuler's customers.

Your direct contact to the Hydroforming TechCenter Canton, MI (USA)

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B-pillar component, material DP1000.

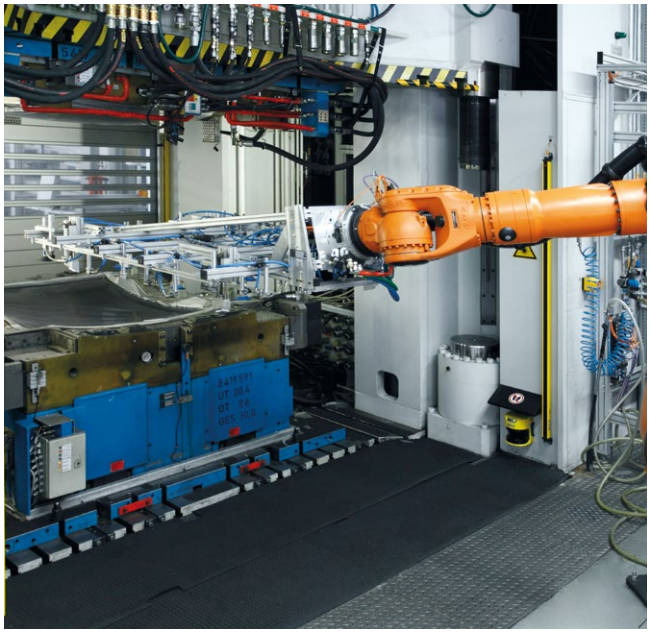
Hydroforming press for high strength and ultra high-strength materials.

Hydroforming offers a wide variety of design opportunities for the components. The demand for low weight is met by the components because of the reduced material input. Furthermore, additional functions can be integrated and an optimum use of the available space in the vehicle is possible. Almost 100 % of the material can be utilized when the component ends are formed to nearly final shape. The components are characterized by longevity due to the lack of weld seams and the geometry which is optimized for the specific function. The repeatability of the hydroforming process is another outstanding feature. With the new "Full Spectrum Hydroforming" process for low and high pressure ranges, we respond to the applications of ultra high strength steels.

Team spirit. Schuler works with customers at the initial design concept to ensure the design is optimized for both desired performance and cost efficient production. This can save a lot of money in the development phase – early FEA analysis and experience can greatly reduce the amount of potential revisions needed to reach the final design. Schuler's team is experienced in designing for high-strength steels to overcome the challenges of springback, providing performance with thinner gauge tubes. The design team is able to deliver die designs that can be used in most hydroform systems around the world for flexible global production. These advances have reduced the development costs of hydroform applications, making it economically feasible for more applications.

BEST QUALITY AND PRODUCTION RELIABILITY.
PLASTIC FORMING.

The metal and plastic forming industries are on the lookout for economic and flexible systems to manufacture parts for lightweight automotive designs. The best quality and highest production reliability need to be guaranteed throughout.



High volume production of carbon fiber roofs automated by robots.

Hydraulic composite molding presses for high volume production.

Up to 50 percent lighter. Fiber-reinforced plastics offer design freedom and high functionality combined with minimum component weight. Hydraulic press systems deliver innovative system solutions for high volume production of fiber-reinforced plastics, and meet even the most demanding requirements on components and production.

Up to 50 percent lighter than comparable steel parts, fiber reinforced plastics are now essential aspects of automobile design. The challenge with regard to these "lightweights" remains to reduce the costs of the manufacturing process and of the parts themselves.

Nowadays, about 15 percent of a new car is comprised of plastic – from structural components such as front ends, underbody trims, instrument panels through to functional elements such as head restraints and door handles.

Flexible solutions. In the recent past, Schuler has built a wide range of production systems to process fiber-reinforced plastics with hydraulic press technology. Different systems are used depending on the component requirements and production process.

Hydraulic composite molding presses for high volume production.

Hydraulic short stroke press for producing fiber-reinforced plastics.

Our hydraulic press systems are suitable for series production of SMC (sheet moulding compound) components, GMT (glass mat thermoplastics) components, and RMT (resin transfer moulding) components.

The requirements on modern production machines are great: accuracy, precise reproducibility and simple operation are at the top of the list. The open and closed-loop control systems we have developed ensure continuous operation for the long term with smooth-running production processes.

Schuler is your reliable partner when it comes to standardized modular solutions for rapid start-up and maintenance, for standardized and user-friendly machine visualization systems as well as sequence charts for operators to enable production start-up without difficulties. We place great emphasis on process data analysis in order to support process optimization and remote maintenance.

EFFICIENT WEIGHT REDUCTION.
ALUMINUM FORMING.

Aluminum has now become a standard material in the area of hang-on parts in many vehicle types. The material can significantly reduce the weight of a body-in-white, even if it is only part of the total solution.

Hydraulic press lines with robot automation for manufacturing aluminum components.

Nowadays, about 40 percent of the overall weight of a car is accounted for by the body. Aluminum is being used to an increasing extent in automobile production, a key component to the trend for an larger variety of materials.

From the skin through to the front wing/fender and bonnet/hood – aluminum is being used more and more frequently in modern, reduced-weight vehicle designs. These applications are selected as a means of replacing heavier mate-rials with lighter weight aluminum. Thanks to its unique energy absorption ability, it can also save lives in case of a collision. Lower fuel consumption, greater comfort and performance and increased safety support the use of aluminum as a material.

Schuler develops mechanical and hydraulic press lines as turnkey solutions for processing aluminum skin panels. We deliver suitable retrofit solutions for existing production systems. Our turnkey machines have all of their components designed for the materials they will process, from automation through to the press and die procedure followed throughout the entire process. In this way, all the individual components of the machines function smoothly.

Aluminum's crash resistance factor means it is particularly suitable for efficient weight reduction. It is possible to make each vehicle up to 40 kilograms lighter. To do this, however, all body parts from the bonnet/hood and the wings/fender through to the doors and luggage compartment lid or tailgate must be made from the material.

Modern blanking lines process a wide range of materials, including aluminum.

LIFECYCLE SERVICE FROM SCHULER.
EXTENSIVE INDUSTRY SERVICES FOR FORMING TECHNOLOGY.

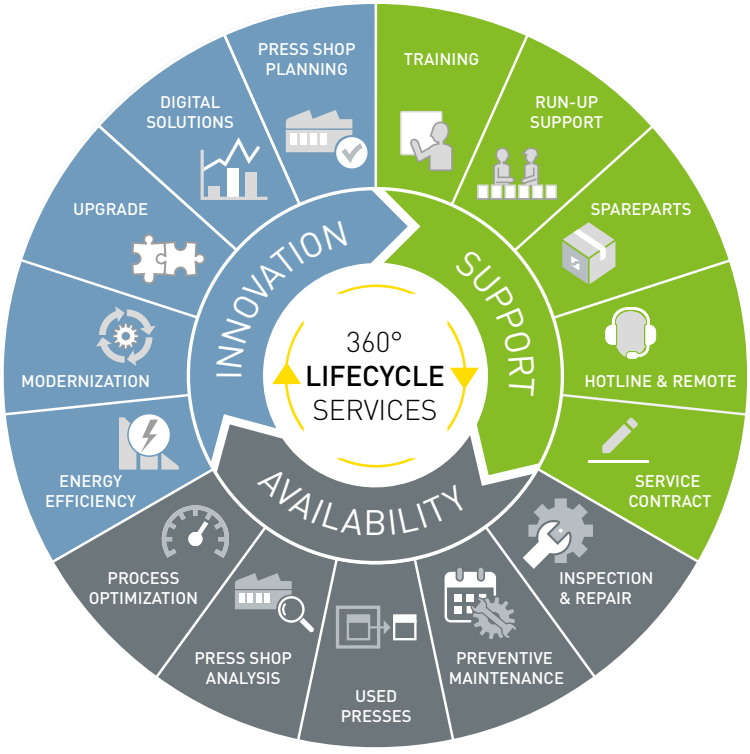
From the dependable supply of spare parts and rapid assistance in the event of malfunctions to the digital transformation process: products and services from Schuler Service help you to keep your system running at an optimal level.

Whether it's spare parts service, maintenance work, modernisations, used presses, IT solutions, or our 24/7 support with quick response times: you can count on our Service Team to ensure maximum safety and system availability in your press shop – whenever you need us, even on our 24/7 Hotline.

Our experts provide you with the right solutions over the entire lifecycle of your system whilst assisting you with digital transformation, from consultations about various available IT solutions to the actual implementation.

Schuler Service is here to help as your competent partner. Reliable, knowledgeable and friendly.

We look forward to hearing from you.
Your Service Team.



MORE INFORMATION

www.schulergroup.com/service_en

ABOUT THE SCHULER GROUP – WWW.SCHULERGROUP.COM

Schuler offers customized cutting-edge technology in all areas of forming – from the networked press to press shop planning. In addition to presses, our products include automation, dies, process know-how and service for the entire metalworking industry. Schuler's Digital Suite brings together solutions for networking forming technology and is continuously being developed to further improve line productivity and availability. Our customers include automotive manufacturers and suppliers, as well as companies in the forging, household appliance and electrical industries. Presses from the Schuler Group mint coins for more than 180 countries. Founded in 1839 at our headquarters in Göppingen, Germany, Schuler has approx. 5,000 employees at production sites in Europe, China and the Americas, as well as service companies in more than 40 countries. The company is part of the international technology group ANDRITZ.

Hydraulic press systems

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