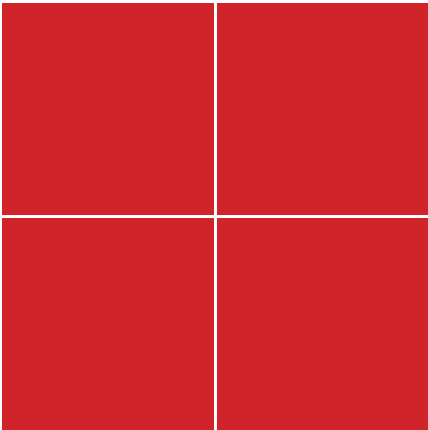




The world of hydraulic drive technology





Valued customers, partners and interested parties

Hydraulic power engineering is our profession and our passion. True to the claim „delivering peak performance every day“ our accomplished expert project-teams will advise and inspire you. Based on the customers requirements specification our experts accomplish their assignments in the areas of hydraulics, mechanics, controls and software, from single components to the complete solution.

We are globally active as supplier to national and international concerns in diverse branches, mutual motivation and continuous development is our daily stimulus. Therefore we always stand ready with innovative ideas and solid solutions.

Whether it's large, complex challenges or clever individual components: we are only happy with complete success in the fulfilment of your task. On the following pages we would like to give you a glimpse into our world of technology and also hope to spark your enthusiasm. We are looking forward to a collaborative project with you.

Heinrich Hagenbuch

Corporate History Milestones




1955 Heinrich Hagenbuch (1901) already concerned himself with oil hydraulics as a young man, constructing special-purpose machines and presses with hydraulic power units. Because the quality of supplied components was unsatisfactory, he grounded his own company: Hydro H. Hagenbuch.

1964 Heinrich Hagenbuch jun. (1939) takes over direction of the company. To meet the rising demands of the market-place, hydraulic-drives are combined with electronic components opening completely new areas of application.

1967 Hydro H. Hagenbuch becomes Oelhydraulik Hagenbuch AG. The name change underlines the core competence in hydraulic drive units.

From Hydraulic specialist to system builders with 60 years of experience



Although our success is based on oil hydraulics, our growth and international development is the consequence of a corporate concept based on an integrated vision.

Hydraulic drives are complex systems that along with high quality components also require sophisticated control system. To meet the demands of our complete system solutions we have a in-house development programme. Along with fabrication of components and power units we also specialise in the areas of mechanics, electronics and control systems.

That means that today we are a competence centre for components and drive systems from middle to high complexity and a world-wide supplier of innovative complete system solutions. OHE plans and develops customer orientated solutions for demanding projects, delivers all system components from one source and performs commissioning around the globe.

As supplier to numerous domestic and overseas corporations in various specialist areas we provide the following key services:

- Conceptual design of hydraulic drives with cylinders and power units
- Test bench apparatus for the automotive and aviation industries
- Production facilities for paper and steel manufacture
- Propulsion concepts for the entertainment industry
- Supply of special components for all types of investment goods
- Equipment for hydroelectric and power engineering
- Drive concepts for passenger transportation
- Simulation concepts for the film industry
- Hydraulic servicing

1978 Hydraulic unit construction plays an increasingly strong role. Strong corporate growth leads to a deficit of space. The solution lays in new construction on the same site.

1980's Increasing emphasis on complete system manufacture. Our customers especially value our integrated-system perspective - at Hagenbuch you obtain an all-inclusive one-stop solution.

1990's The 90's bring new challenges. Fast electronics and software open new perspectives for our drives. To exploit these opportunities the engineering team is expanded with young specialists.

1994 Once again space is getting tight. The office building is extended by two floors.

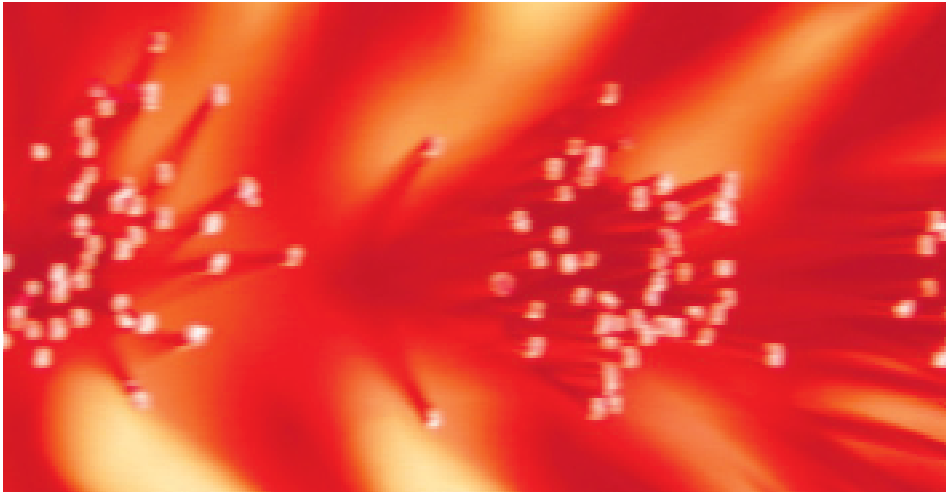
1996 Heinrich Hagenbuch jun. (1970) joins the firm. He leads today, as the third generation, the fate of Oelhydraulik Hagenbuch AG.

2000 An independent business unit is established for customer-services and commissioning.

2010 The existing buildings are becoming cramped for our nearly 50 employees. A new hall is being built for the service center and the new testing center.

2015 The company Hagenbuch AG is looking forward to a milestone birthday - 60 years of experience in hydraulics.

2018 Preparing for the next decade it was time for modernisation. Oelhydraulik Hagenbuch AG is now called Hagenbuch Hydraulic Systems AG.

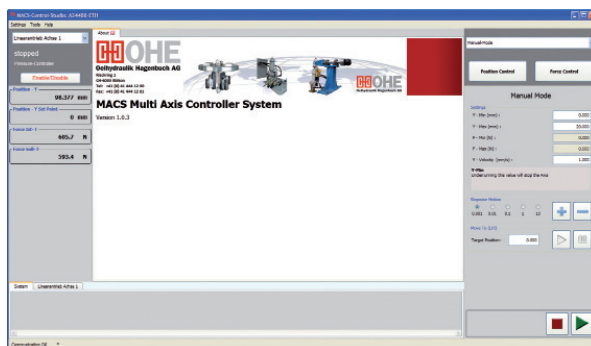


The complete solution provider with production capability

We can prove our strength in hydraulic drive technology best when we provide complete solutions. In other words: when software, controls, hydraulics and the interface to the manufacturing process form a continuous chain.

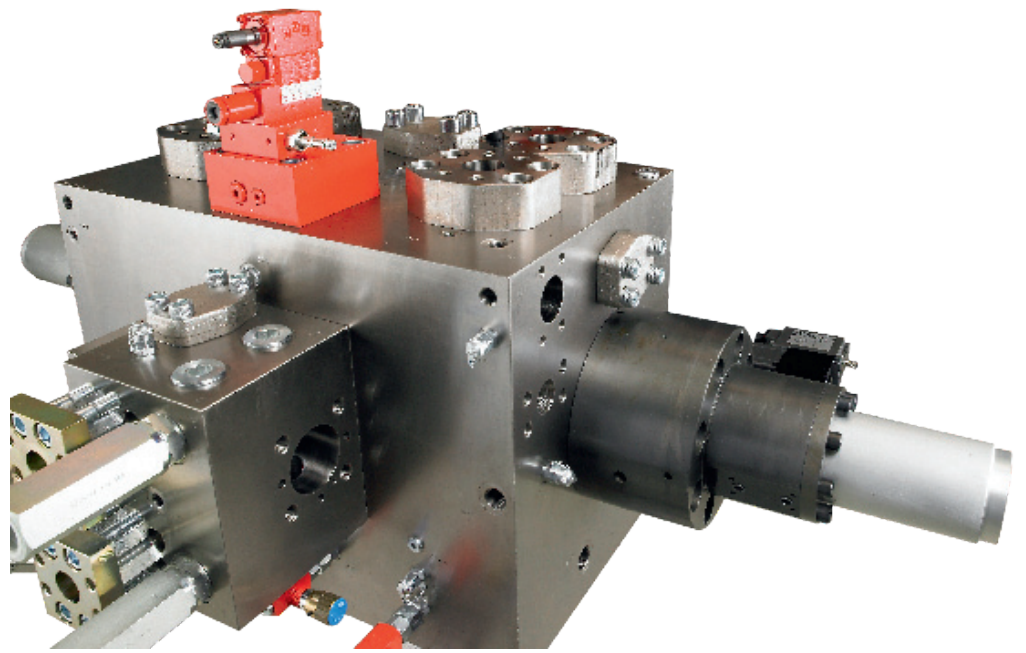
As complete solution provider we don't just develop and plan solutions, we also realise these directly in our own assembly hall. Our modern production and assembly equipment (NC-machines, CAD-CAM-coupling) are suitable for a flexible ma-

nufacturing process right down to the smallest production run. Additionally our assembly is equipped with modern test stations, on which the hydraulic and electrical function of our products is conscientiously tested.



Our activities cover the following areas:

- Engineering of complete system solutions
- Engineering of control systems
- Supply of standard components
- Development and production of special components
- Development of customized user-interface software
- Supply of complete control system
- Assembly of control systems
- Commissioning
- Service during the whole life span



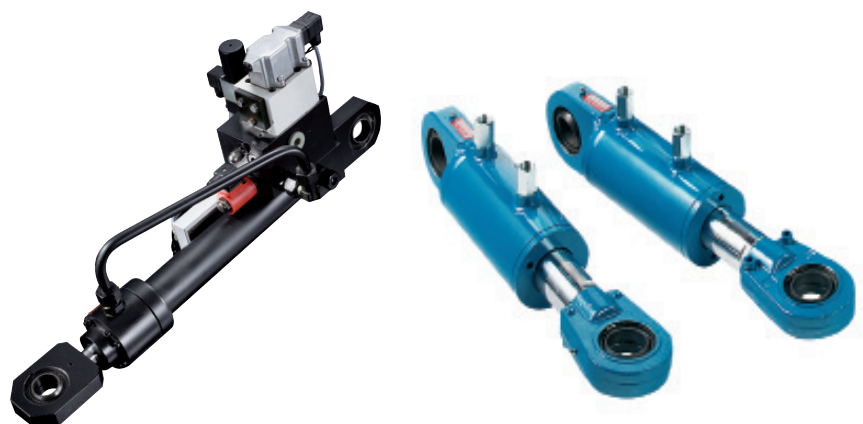


High quality standard components for flexible applications

Whether complete facilities or precise single components: We handle all customer requests with the same demand for high quality.

Our workshops contain modern CNC lathes and milling machines, as well as conventional machines for prototypes and special components. On our high performance test bench our technicians test cylinders, hydraulic units and valve blocks. That means only perfect products leave our factory.

Our single components are qualitatively superior, tuned to your requirement specification, perfectly certified and documented. That way you'll be on the safe side right from the start.





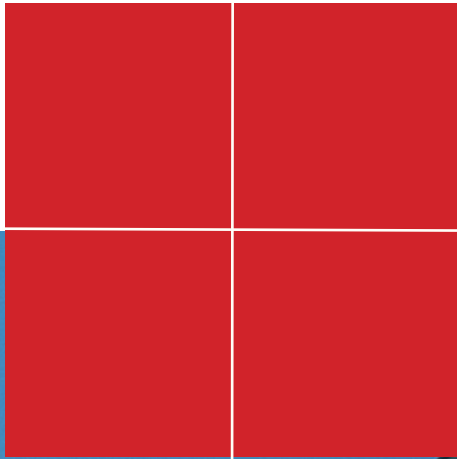


Powerful drive technology for maximum thrill

We are proud of the fact that our customers and partners depend on Hagenbuch know-how for the development of drive technology for some of the most extreme rides in the best-known entertainment parks around. It's quite possible that you've already been impressed by the power of a Hagenbuch drive - and experienced the adrenalin kick.

Drive technology for the entertainment industry places the highest demands on safety, reliability and operational availability. Therefore we use our experience and our innovative strength to fulfil these criteria. We've been creating hydraulic systems for the entertainment industry since 1985. Since then we have realized a multitude of projects with Motion platforms (3 to 6 DOF), accelerators, hydrostatic drives and special dedicated systems.







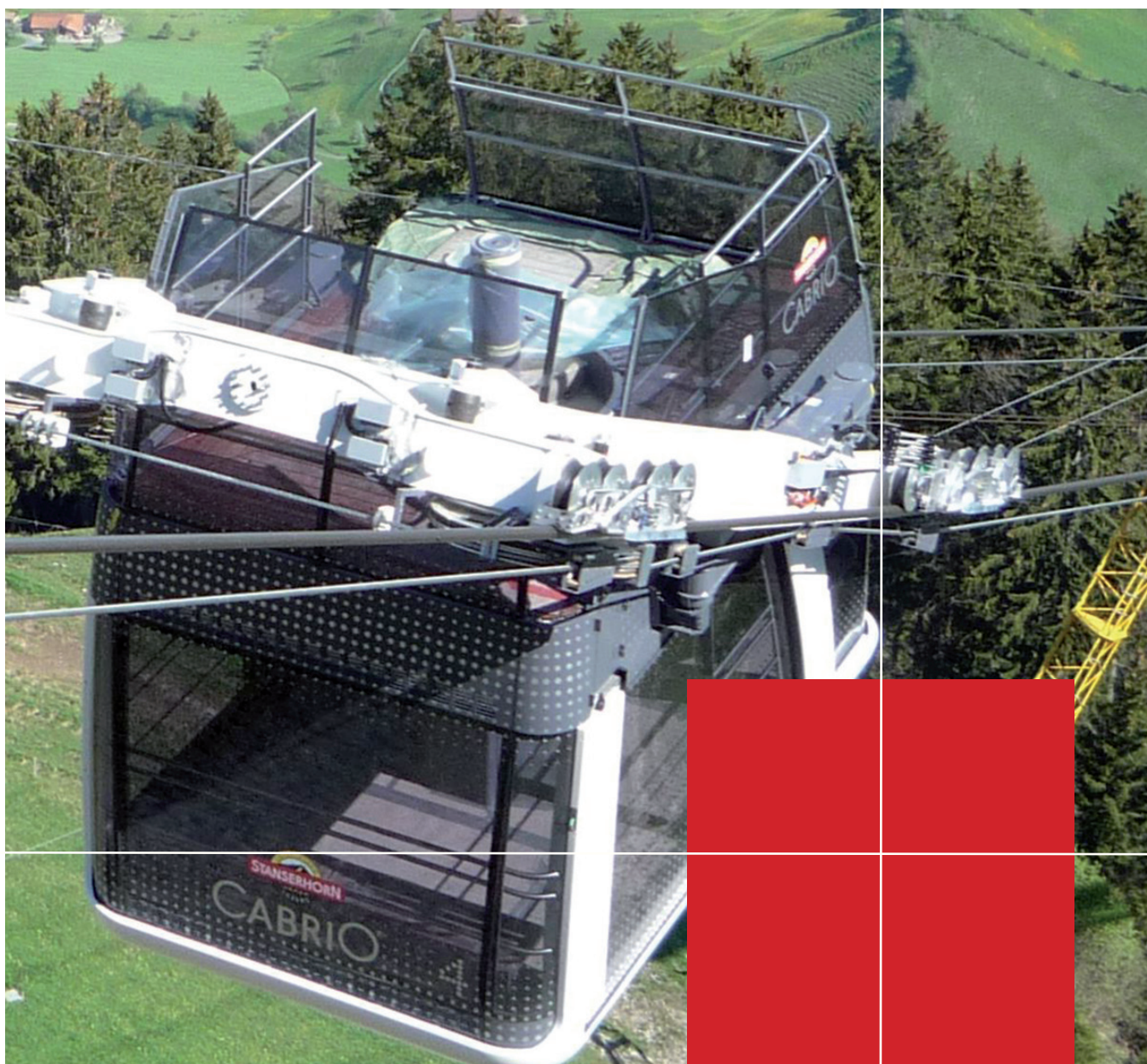
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Drive concepts for passenger transportation

Have you ever stood on the upper deck of the spectacular Cabrio-Stanserhorn cable car? Or have you enjoyed a trip on the nostalgic steam ship Unterwalden on Lake Lucerne? Or have you ever been carried on the unique private railway of the renowned Tschuggen Grand Hotel in Arosa to the skiing area? At the heart of all these amazing railways lies a piece of Hagenbuch drive technology!

Our speciality is the uniqueness of the setting of each task and it's not always just hydraulics that are in demand, but a system with control/regulation and drive technology. So today the beautiful steam ships with their classical design steer with the most modern servo hydraulics. A special highlight of course is the Stanserhorn Cabrio cable car. Through the very high centre of

gravity, the cable car is equipped with a hydraulic level control, which leads to a completely new driving feeling! Another great example is the fully automatic drive system for the elegant railway of the Tschuggen Grand Hotel. With a hydrostatic drive concept with integrated drive regulation, Hagenbuch was also able to bring its expertise to bear in this challenging project.





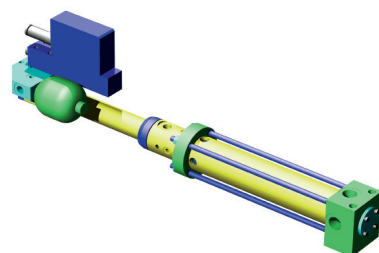
On the test bench

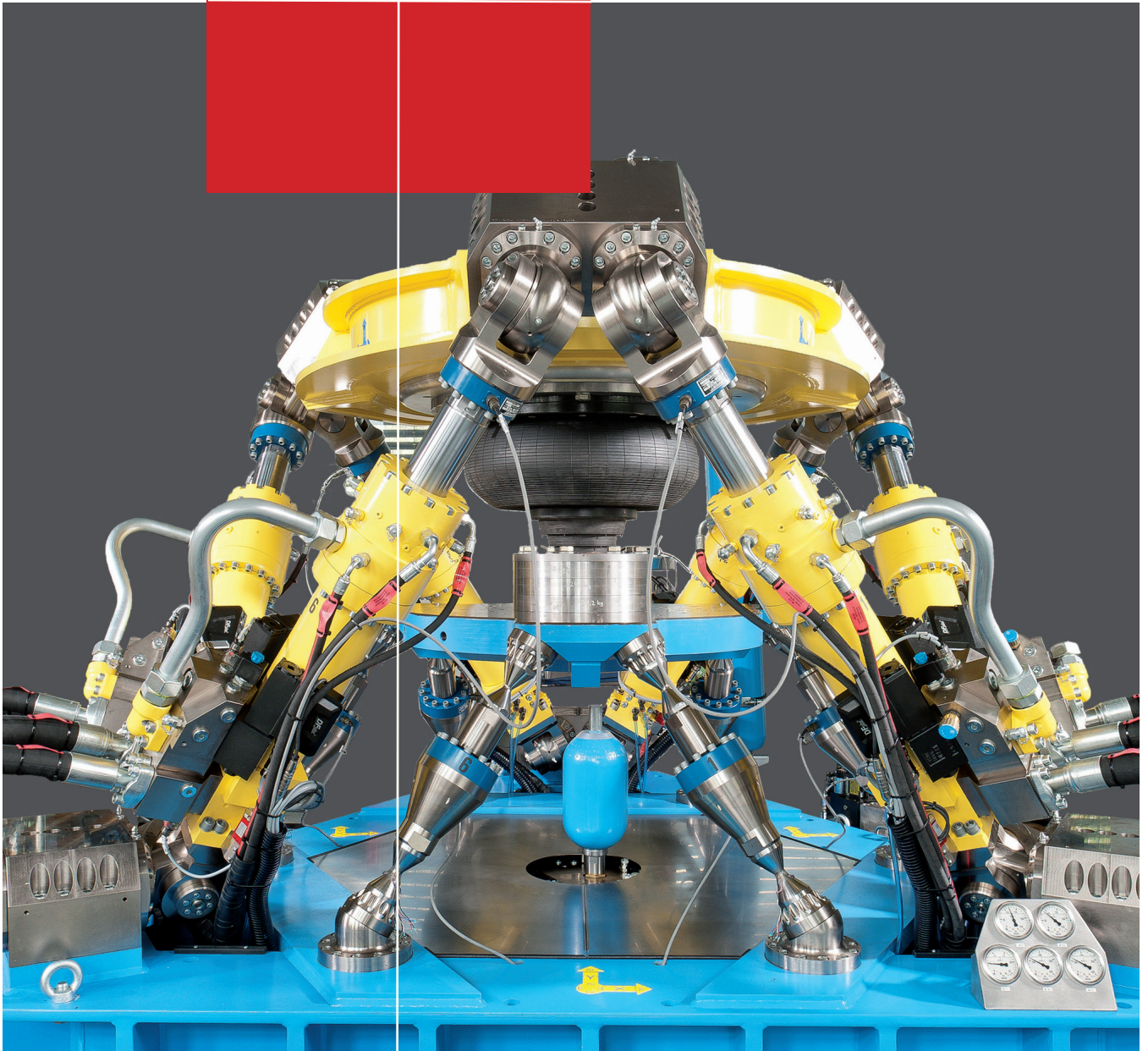
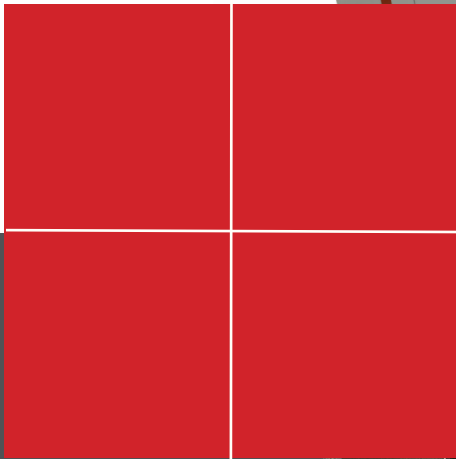
The construction of test benches is the high-end segment of hydraulic drive technology. In this sector we use our strengths to the advantage of the customer. Innovative prowess, knowledge of standard techniques, high competence in controller technology, fast electronics and masterful mechanics allow us to produce effective test benches.

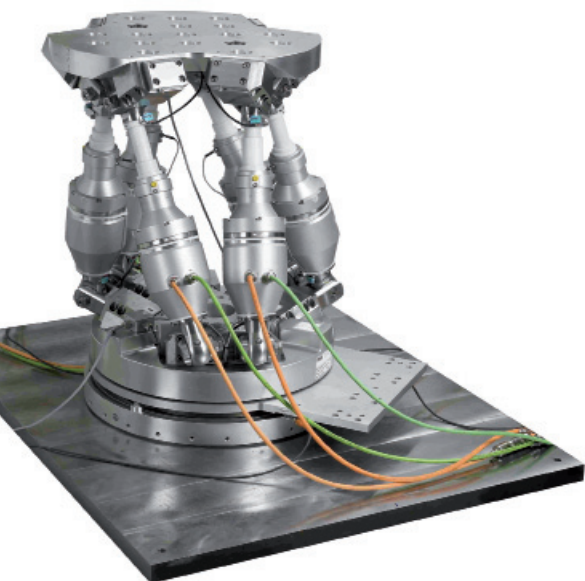
For us what's fascinating about test benches is the diversity of the type of problem. Position, force, pressure, temperature etc. must all be precisely governed to enable the real-life demands on the component to be simulated on the test bench. In previous years we have developed a series of modules that enable us to quickly realise new solutions. In addition to drive technology like the Hexamove-System we also supply pulsation drives with hydrostatic bearings, force control systems and pressure intensifiers, above all with imaginative software. With our innovative concepts we position ourselves as your partner for complete test bench system solutions. That begins with the feasibility study, continues through development and into commissioning and ends in a cooperative accompaniment of the customer during deployment.

Our test benches:

- Complete facilities according to customer requirements
- Pulsation-drives
- Force control systems
- 6 DOF Motion-Systems
- Pressure intensifiers
- Optimiser software
- Integration in customer environment (e.g. Climate chambers)
- Individual test service







Hexamove - Movement made easy

The Hexamove system unites the best of our expertise in one device. What began at the end of the 80's in the entertainment industry has today developed into ambitious technology. The devices captivate with their outstanding dynamics, enormous bearing loads and astonishing versatility.

The Hexamove systems represent the high end segment of drive technology. If the platform is floating in space and one has the impression that the 6 cylinders are being pulled along without resistance, then that suggests a perfect synchronisation of the drives. With the versatility of the devices and above all the software, we were able to open up the most diverse areas of application.

Robotics

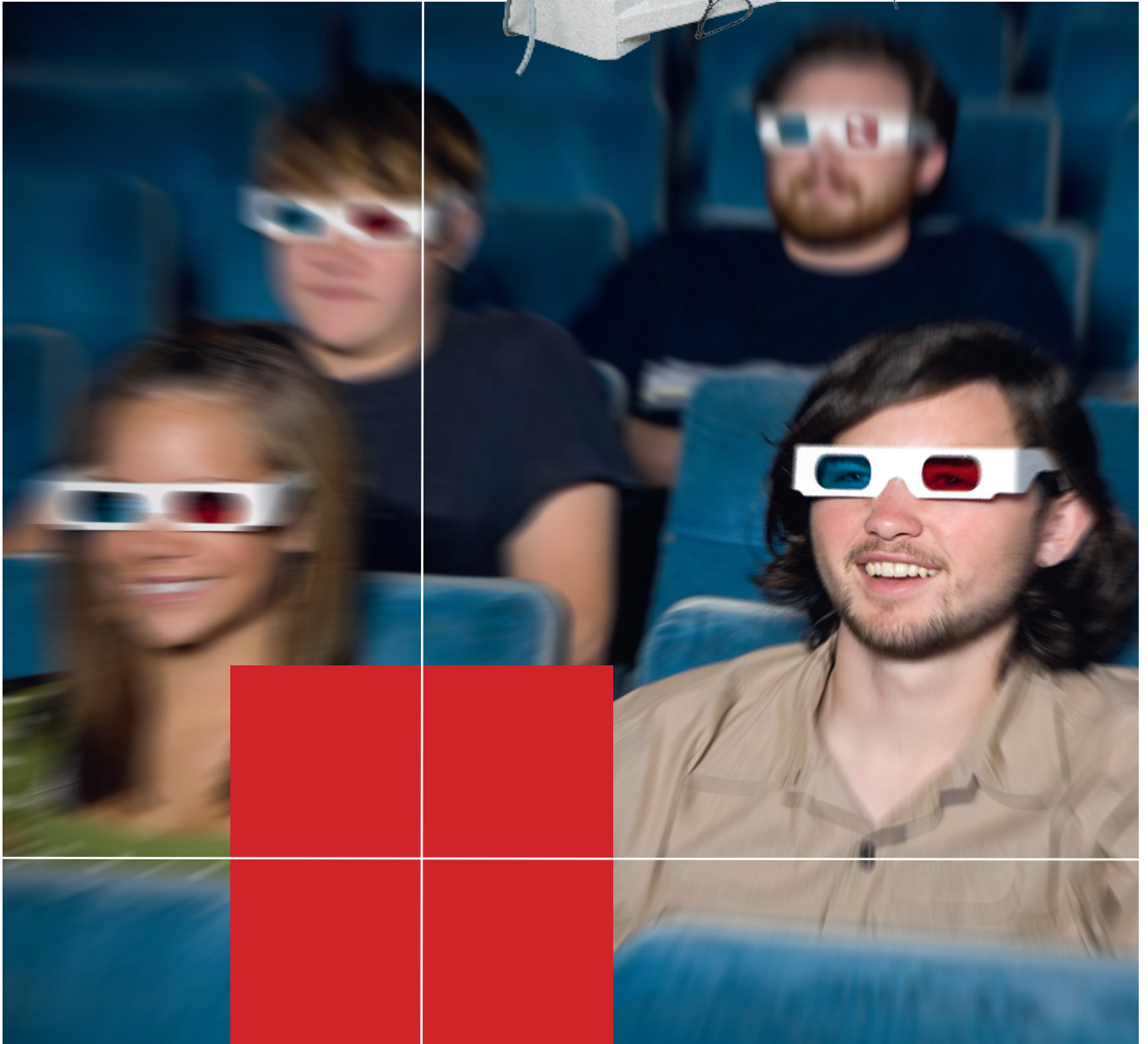
Parallel kinematics enables the automatic, very precise positioning of pay loads. Whether it's the undercarriage of an A380, the fuselage of an A400 or material sampling in the neutron beam of the most established research institutes - the Hexamove drive concept proves itself excellently.

are proving their worth in the development of vehicle components, in simulation training for driving wheeled loaders in mines, but also in entertainment in amusement parks. Whether it's cinemas with many synchronous Hexamove systems or motion platforms on fully automated vehicles: there are hardly any boundaries for ideas.

Test equipment

The high-tech range comprises test equipment. In no other tasks are there such high demands for accuracy, dynamics and versatility. It's not just paths that are controlled, but also forces, torques, pressures, etc. These test benches are built for the simulation of the hard reality of heavily stressed components in vehicles, aeroplanes or raw material.

Parallel to the examination, the Hexamove system also establishes an equally comprehensive measuring system for forces, torques, positions and angles - and all that with impressive accuracy!





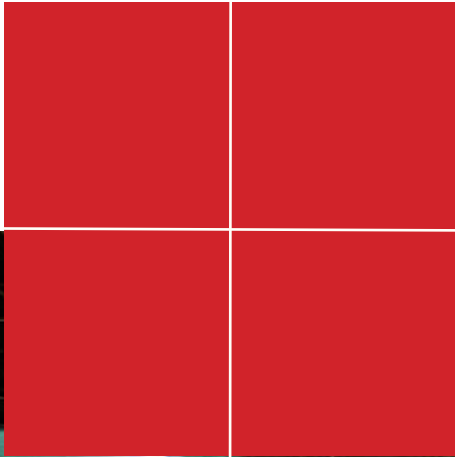
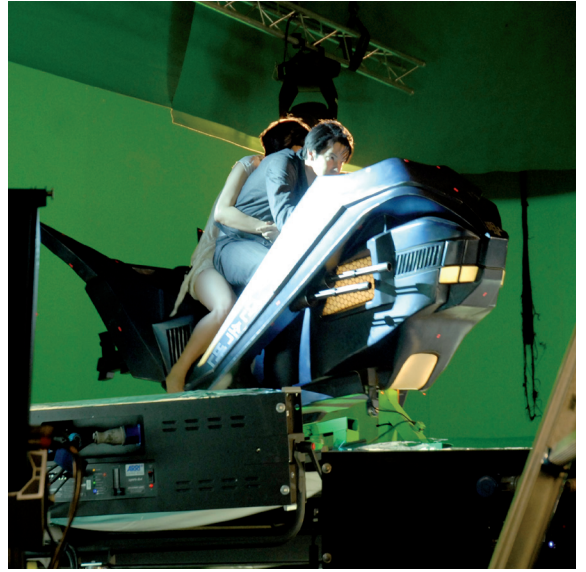
Special effects for Hollywood-Blockbusters

Hagenbuch Hydraulic Systems AG goes Hollywood - a not altogether everyday experience for our company. With a flexible control system for up to 12 hydraulic servo-drives, our engineers were able to support the exciting productions of the films «Cloud Atlas» and «Die Hard 5» directly on set.

In this business above all quick perception, flexibility, ideas and sometimes also a little improvisation are needed. However, with good technology we are prepared for it. To roll a VW beetle onto its roof with a hydraulic rotary drive with simultaneous synchronous movement of the camera - to simulate with a motion base a futuristic flight through Seoul - or to move whole helicopters and vehicles in front of a green screen - those are amazing challenges for us, in which our comprehensive view of customer value comes to

the fore. For us, it's not enough just to supply a part - we want to solve the whole task for the customer, to supply or provide hydraulics, controls and software and to start the action with our expertise as a service directly on site.







Services for individual needs

Along with our highly qualified technicians, the use of the newest technologies and our own production facilities and services make us a competent and reliable partner for complete drive system solutions.

The driving principle of our business is project-oriented teamwork based on our certified quality management. Complete provision of service in the arena of oil hydraulics round off our offer. Depending upon requirements you can select only those services that you require from our wide service palette.

General services:

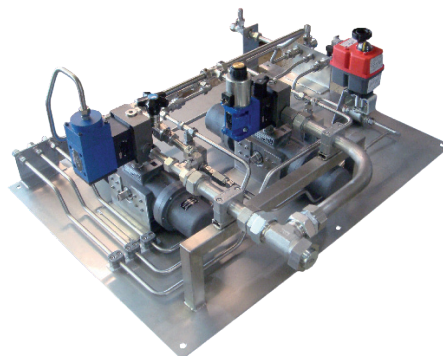
- Expert consultation and competent engineering by hydraulics specialists
- Individual service and maintenance contracts
- Immediate repair, either locally or in our factory

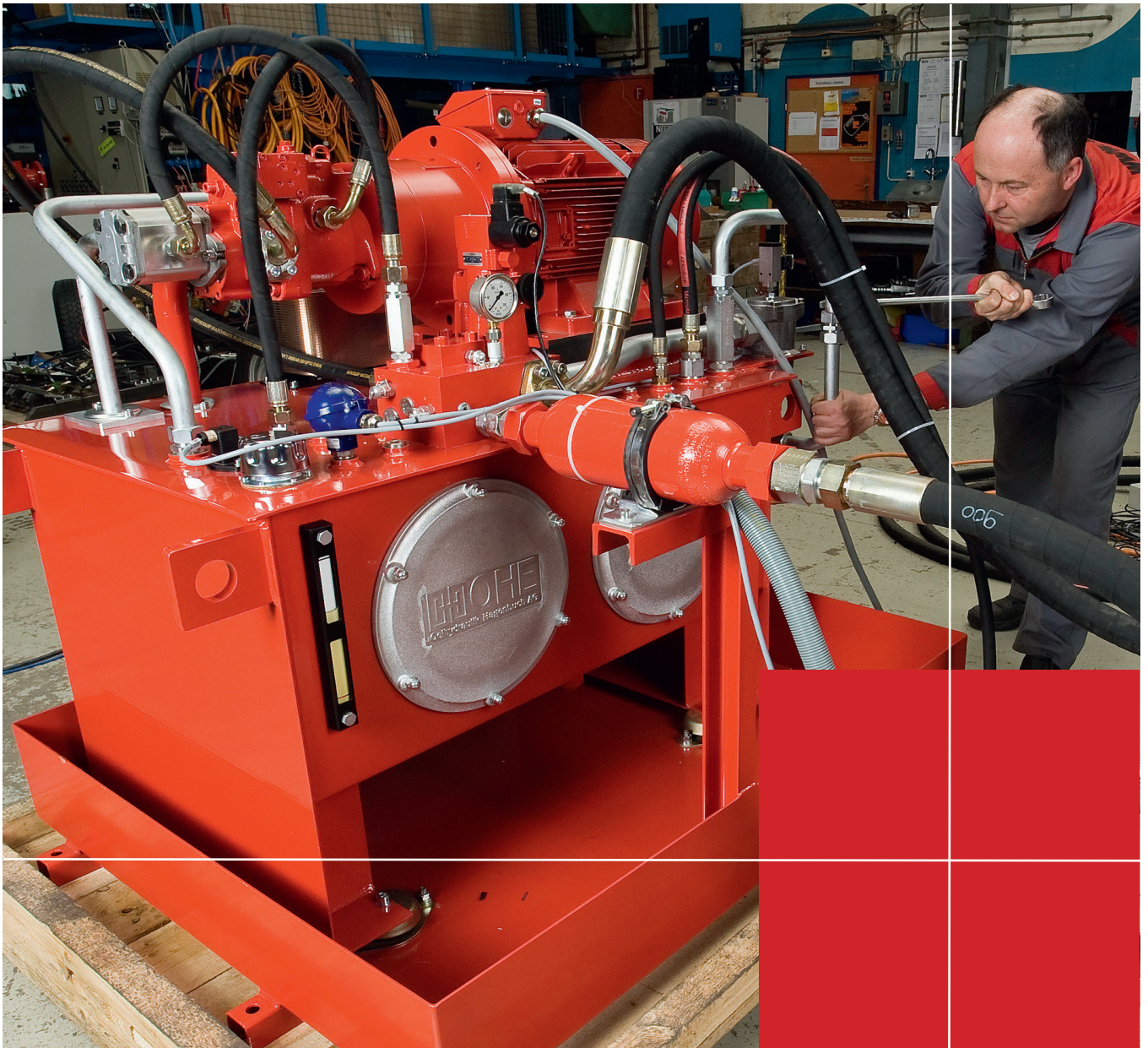
Service center:

- Hose service / Eaton-Aeroquip
- Filter technology
- Oil analysis (directly on-site)
- Overhauling old and/or damaged cylinders
- Direct contact with our technicians

Schooling / Training:

- Training courses in the basic principles
- Practice courses with laboratory exercises
- Courses for special knowledge





The basis for highest quality standard

Applications:

- Entertainment and pleasure parks
- Automobile and aircraft industry
- Test and positioning apparatus and further applications
- Manufacturing facilities for paper and steel industry
- Equipment for hydro power and power engineering
- General mechanical engineering

Through experience comes success

Clever concepts for customized drives

Assured quality of manpower and technology

Internal knowledge further communicated

Our maintenance and service team never keep you waiting long



Consultation

For us consulting means listening. First we analyse your requirements in discussion. Consequently we develop precise recommendations. With the involvement of our developers your requirements are as good as fulfilled.

Engineering

We offer our customers not only components, but system-solutions inclusive of electronics and software. Our know-how is in demand world-wide because it makes the impossible possible. Together we develop a solution that is optimally tailored to you.

Production and Commissioning

You never stand alone. Hagenbuch supplies not only an optimal product but also the assurance of a perfectly running system-solution. Therefore our highly qualified team are at disposal on location and around the globe.

Training

To know how something works saves money. Our advantage: We know, what you need to know, to ensure reliable operation. To-the-point training ensures the economic function of our technology.

Maintenance and Service

Even after commissioning your system will be attended to by an experienced team of mechanics and Engineers. We offer servicing on-site world-wide or in-house - either on the basis of service contract or on individual specification.



Hagenbuch Hydraulic Systems AG, Rischring 1, CH-6030 Ebikon, Tel. +41 (0)41 444 12 00, Fax +41 (0)41 444 12 01

info@hagenbuch.ch
www.hagenbuch.ch

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