

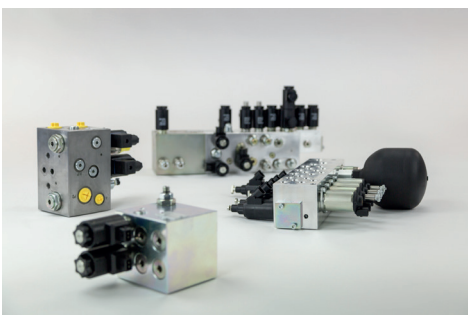
Technical article

Smart products smartly produced

Bucher Hydraulics: a high level of automation ensures good productivity and flexibility when manufacturing compact customised subsystems.

The Frutigen facility in Switzerland is the Competence Center for control blocks (subsystems) and cartridge technology within Bucher Hydraulics in Europe. The entire project engineering process, from the initial customer idea to the finished product, is application-focussed and takes place directly on site. This requires not only extensive product and application knowledge, but also efficient in-plant processes for adding value. That is why optimised processes and short lead times are now important aspects in the planning of control blocks, with highly automated manufacturing and assembly systems making it possible to create sophisticated solutions.

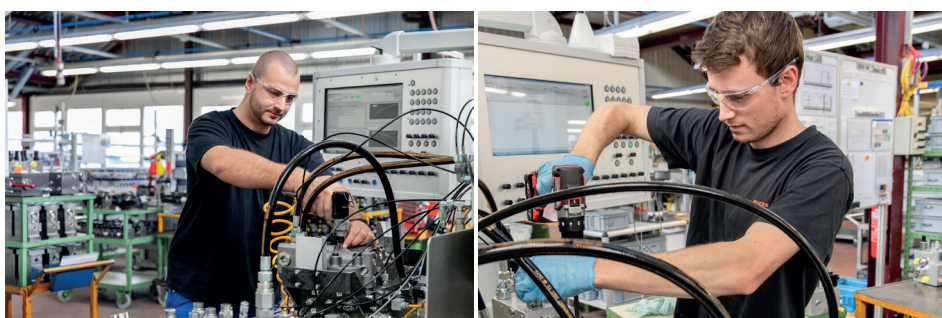
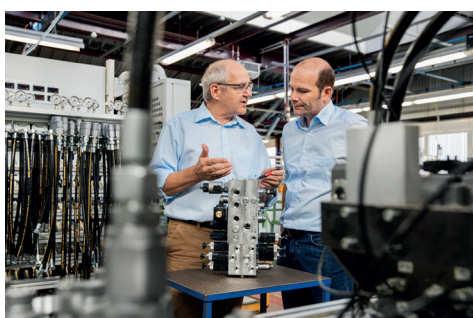
In the same scenic Bernese Oberland where others enjoy their holidays, Bucher Hydraulics makes an impact with in-depth know-how and state-of-the-art production. Within Bucher Hydraulics, the Frutigen facility is the Competence Center for control blocks (subsystems) and cartridge technology in Europe and employs more than 300 people in manufacturing, development and sales on a production area of around 20,000 square metres (215,000 sq. ft.)



The Mobile Systems department specialises in the project-planning, design and production of customer-specific system control blocks. Highly qualified employees develop the customer's initial idea through to volume manufacturing and commissioning. The range of applications for system technology includes mobile equipment for the construction, agricultural and municipal machine sectors. There are also applications in the industrial sector, which includes renewable energies such as wind and solar power plants. Common to all applications is the trend towards improving the hydraulic system. While major customers usually design and optimise their own systems in-house, medium-sized and smaller companies expect extensive expertise and services from their hydraulic partners, and this requires close cooperation. Bucher Hydraulics meets these constantly growing demands by offering decades of product and application experience, and the company combines this knowledge with extensive know-how in the area of production techniques for system solutions.

Peter Schmid (left) and Bernhard Zbären (right) together manage the Mobile Systems department in Bucher Hydraulics AG Frutigen in Switzerland. The Editor talked with them about the challenges of modern control blocks (subsystems) and how to produce them.

The functionality of the Bucher Hydraulics control blocks is fully tested on the test stand, the customer-specific test data is recorded and can then be individually retrieved by the customer.



A competitive lead from automation and precision

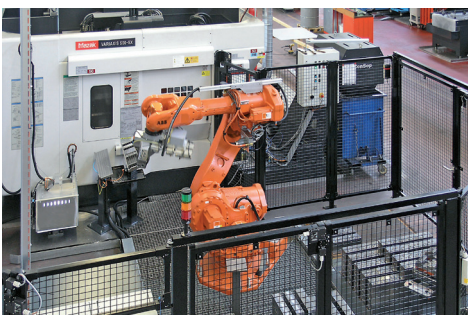
In general, control blocks are as varied as the applications in which they are used, the result being that there are many different possible combinations. As well as outstanding functional reliability and long service life, features such as robustness, compactness, low weight and cost efficiency are required for virtually all applications. In the mobile hydraulics sector, the demands are increasing even more due to the often adverse environmental and weather conditions. Manufacturing medium- and high-volume product ranges cost-effectively despite the large number of variants is challenging, and from the early project-planning stage of new control blocks, the project leaders at Bucher Hydraulics weigh up which manufacturing processes can be used most productively.

Accuracy, reliability, flexibility and safety are not simply characteristics of the control blocks themselves, they are also decisive factors for manufacturing them cost-effectively. This is where precision work secures the lead in the market. That precision is the result of continuous investment in the automation of manufacturing and assembly, and in the expansion of the in-house infrastructure that Bucher Hydraulics operates 24/7 around the globe.

The Swiss company is thus setting new standards in terms of the compactness and low weight of hydraulic system control blocks. These characteristic features are based on sophisticated manufacturing and assembly strategies. Thanks to modern manufacturing cells that include industrial robots, 3D oblique drilling of the control blocks can be performed in just one work step without any re-clamping, which can significantly reduce production times.

The automated multi-face machining is carried out in ultra-modern precision machining centres. This shortens production times and increases accuracy. Raw-material blanks are loaded, and machined workpieces are unloaded, using a fully automatic magazine, which again significantly reduces set-up times.

Short clamp-to-clamp times and minimised set-up times are the outcome of state-of-the-art manufacturing cells with intelligent industrial robots. Thanks to the shorter throughput times that are achieved, the high degree of automation enables high productivity and increased flexibility regarding the batch sizes that have to be produced.



Focussing on throughput times and batch sizes

Bucher Hydraulics uses state-of-the-art precision machining centres that accomplish multi-face machining in shorter production times and with the greatest precision. Fully automatic magazines feed raw-material blanks into the machining centres and unload the machined workpieces, which again significantly reduces set-up times.

Intelligent industrial robots ensure short clamp-to-clamp cycle times, and they also minimise the set-up times: even for small batches, tool changes are organised in the same way as they are for mass-production runs. The optimised manufacturing processes thus enable significantly higher productivity and flexibility, and result in shorter throughput times.

In addition, Bucher Hydraulics uses an extremely wide range of dedicated high-performance tooling, which is loaded into the machines for specific orders fully automatically. The cutting speeds in the machining process are several times higher than normal, and the high-quality control blocks are therefore manufactured economically.

In order to fully exploit the advantages of the individual production machines, Bucher Hydraulics designs, optimises and precisely coordinates all the processes in its own production engineering department. The same applies to all clamping fixtures, tools and grippers. The project leaders who design the system control blocks can also draw on the required production know-how so that they can make use of it right from the early design stage of new solutions. 'Smart products smartly produced' is therefore an approach that also pays off for users right from the start.

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