

HYDRAULIC FIXTURES



ALMÜ

EXACT. CUSTOM-MADE.

PRÄZISIONS

FAST. FLEXIBLE.

WERKZEUGE

FAIR. TRANSPARENT.



- A // A hydraulic fixture "made by ALMÜ"
- B // Final assembly of a complex group of components for a hydraulic fixture
- C // Modeling the device



## PRECISION & INNOVATION

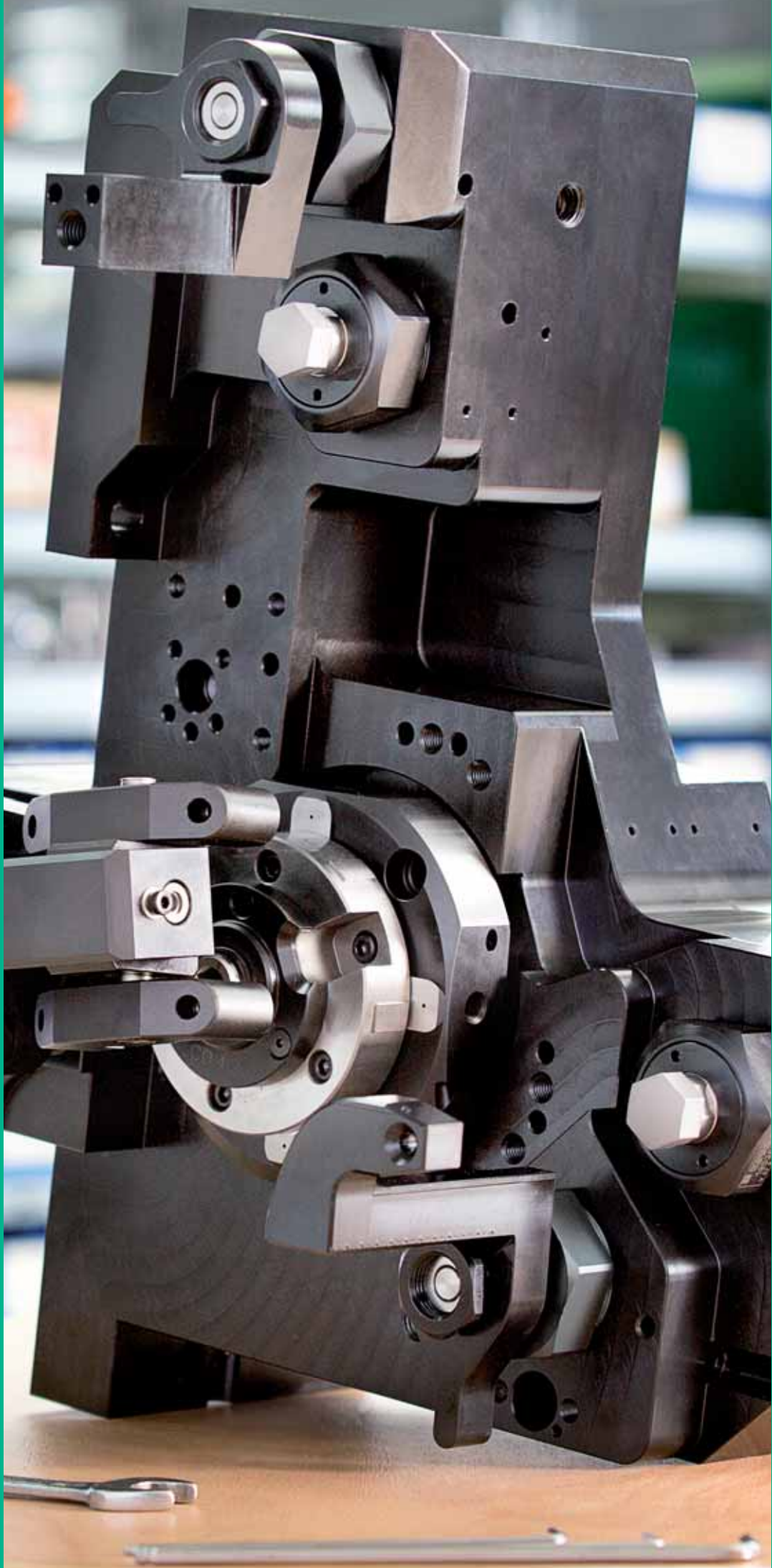


Markus Müller, CEO at ALMÜ

ALMÜ Precision Tools is a mid-size company specialized in developing, manufacturing, and distributing precision tools and other special tools for the chipping, cutting, and milling industry. Moreover, ALMÜ has completed its range of products by constructing hydraulic fixtures. Our focus thus lies on complete solutions: especially the interaction between tool design and construction, device construction, and engineering.

For more than thirty years, ALMÜ has produced tools for the automotive industry and its suppliers – near the Swabian Alb in southwestern Germany. Companies from the mechanical engineering industry are among our customers, as well as lots from the aviation and aerospace industry.

With almost forty employees, our company not only uses the most modern production technologies, but also makes sure to offer rapid, precise, and flexible services.



ALMÜ

HYDRAULIC FIXTURES

PRÄZISIONS

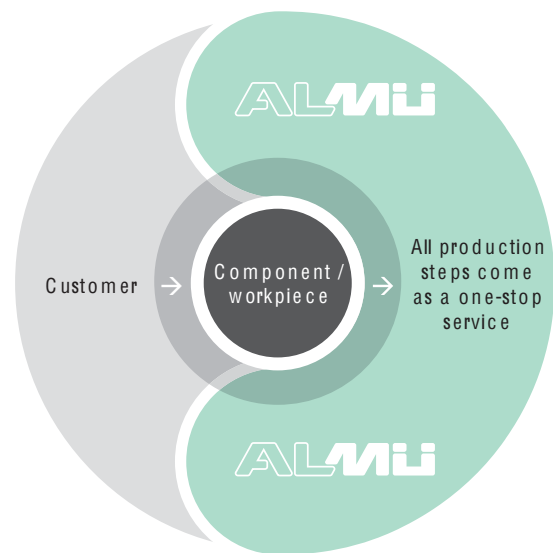
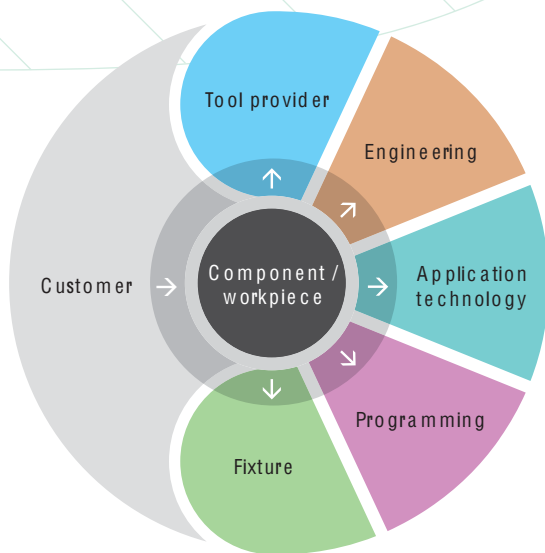
APPLICATION TECHNOLOGY

WERKZEUGE

AND ENGINEERING



## HYDRAULIC FIXTURES



### THE ALMÜ ALL-IN-ONE PRINCIPLE

It has always been ALMÜ's credo to develop innovative technology – which can only be successful if it helps companies increasing its technical processes in quality and productivity, and first and foremost, making them more precise. Tools, fixtures, and engineering services have always

been inseparably linked. This is what the ALMÜ ALL-IN-ONE PRINCIPLE stands for. As the illustrations show, our one-stop service takes care of all steps and components you need. The result are cost benefits and great value for money for all our customers.

## CONCEPTION

Day after day, many of ALMÜ's customers are facing the same challenges: due to increasingly shorter production cycles, they have to live with the steady change from machining discontinued workpieces to working with new ones. Most often, the tools and hydraulic devices are in the spotlight. As a first step, we analyze the requirements in a machining study, leading to an overall concept. Together with our customers, we devise the technologically best solution.

Hydraulic centering element



## CONSTRUCTION

This is the basis of a harmonized complete tool-and-fixture package offering creative solutions. ALMÜ's constructors assist you during the entire project, from the choice of the adequate basic material up to the definition of the optimized manufacturing process. Our fully CAD-CAM networked headquarters make it possible to include every refinement conceivable in modern 3D machining construction. You will receive the documentation package as a digital version and in print. The documentation package comprises a set of drawings, a list of pieces, the hydraulic plan, as well as our coordinate measuring machine's test chart.



A



B



C

- A // Measuring a base plate on a 5-axis machining center
- B // Setup of a workpiece in the machine
- C // Final processing steps on the 5-axis machining center
- D // For the steel plates, we use tempered tool steel (1.1730)

## MANUFACTURING

Here comes actually the heart of the entire production process. Due to more than thirty years of experience in manufacturing precision tools, this is the main focus of attention of all those involved. Chip-removing techniques are one of ALMÜ's core competences. Using a CRM software, the 3D models from the construction department are converted into applicable man-

ufacturing data. These data are uploaded into a most modern 5-axle machining center. The first real steps in the production of an hydraulic fixture have been made. By using a measuring sensor, we ensure high quality and precision of the components. By way of manufacturing in a fixture, even complex drilling in dihedral angles becomes possible with the highest precision.





## ASSEMBLY

Now, we attack the particular details. In our separate assembly department, set up especially for the final assembly of hydraulic devices, the carrier and all other components get together. The pre-commissioned purchased parts, all manufactured parts, and the connecting components are assembled like a 3D puzzle. Thanks to the list of items provided by the construction department, not a single piece is missing. As for third-party standard-hydraulic products, ALMÜ purchases them from renowned German manufacturers. That ensures reliability, longevity, as well as spare parts availability for many years to come. In due time and with the best ALMÜ quality, the entire device is harmonized, including a full functional check.



B



D



C

12 // 13

- A // Fitting a pivoting clamping cylinder
- B // In the separate assembly area, we assemble and adjust the fixture
- C // Final assembly of the interchangeable bearing head
- D // Final assembly of the swing clamp
- E // Centering clamp with six clamping fingers



E

## QUALITY & SHIPPING

To ensure the accuracy of the device, we use our coordinate measuring machine to calibrate the entire component assembly. That reduces the necessary final tuning by the customer to a minimum. The measurement protocol then becomes the basis for CNC programming. Of course, we check the fixture hydraulically, adjust the pressure differential of the seating control, and monitor the entire system for leakage during continuous operation during a few dozen clamping cycles.

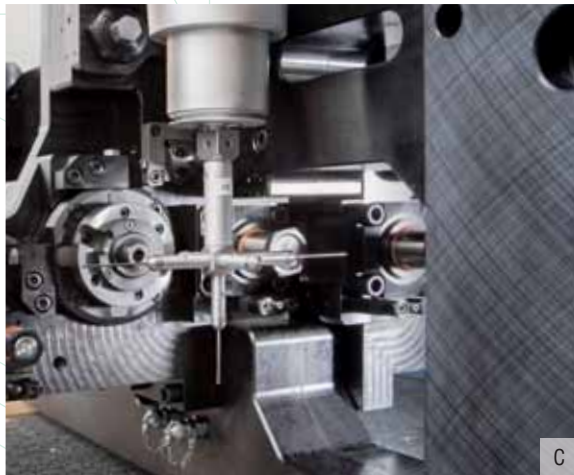
We have been certified according to DIN ISO 9001:2008. Each single manufacturing step has been documented consistently based on predefined test processes – from purchasing of materials to the final products. That makes sure you get impeccable and technologically superb products.

When all production and inspection stages are completed, our hydraulic fixtures are packed safely in individually adapted carrier boxes, and sent directly to our customers.





B



C

- A // Even large devices are measured completely on our Zeiss measuring machine
- B // Measuring a single component on our coordinate measuring machine
- C // Measuring the support and centering points of the completely assembled and adjusted device



Robust wooden transport box:  
everything is safely packed

- A // Improvements and optimization from our own chipping experience are integrated straight into the development of our products
- B // Trochoidal milling with ALMÜ tools
- C // Designing a PCD-tipped spherical cutter

## PROCESS LAYOUT

As a longstanding manufacturer of precision tools, ALMÜ is perfectly familiar with all challenges of producing tools; that goes for simple solid carbide tools as well as for complex PCD monobloc tools.

Combining tools and fixtures means we offer a one-stop service for almost all current machine tools. In modern automotive engineering, in aviation and space technology, as well as in mechanical engineering, precise and often safety-relevant workpieces are required. To ensure our final products are consistently of top quality, you need more than just a mere tool provider.

We at ALMÜ count on partnership and good relations. We really know a lot about the interaction of all components such as tools, fixtures, and machining centers. Determining tools, defining machining processes, developing tool concepts, as well as collision analysis – all these are services provided by ALMÜ. The engineering package ensures a smooth coordination of the various components, even up to run-off tests with measuring programs directly at the manufacturer, optimization of chipping, and start-up support at our customer's place. All packages match each other perfectly.



# APPLICATION TECHNOLOGY

B



16 // 17

Buying a product is the beginning of a longstanding partnership. You can even request intensive support concerning all fields of chipping technology. If you purchase a complete tool solution, we also offer concerted support when it comes to implementing it at your place.

Our customers enjoy our advice regarding the most modern milling, programming, and handling techniques. Along with the implementation of trochoidal milling, deep hole drilling cycles, and other machining strategies, our application technology ensures a perfect performance of all ALMÜ tools in your production. Of course, we also focus on your cost-benefit ratio, as well as on important subjects such as tool life and tool reconditioning.

C



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