

Plastics at their best.

Customized solutions for specific applications.



Generations of progress.

Germany's Black Forest is a unique natural environment that never fails to astonish visitors with its beauty. But a second look reveals another treasure: an industrial landscape that includes dozens of medium-sized companies from Germany's vaunted Mittelstand. After decades of innovation and growth, the Black Forest now boasts numerous global market leaders and "hidden champions".

F. Morat is headquartered in the town of Eisenbach in the Black Forest highlands and provides an excellent example of the region's industrial landscape. A mining village since the 15th century, Eisenbach became a flourishing center of the clock-making industry in the 1700s. This industry shaped the entire region for more than two hundred years and laid the foundation for today's highly developed precision engineering industry,

including manufacturers of turned parts, drives, and fittings. One example of the region's innovation is the ski lift, which was first developed here.

The famed "GearValley" of Eisenbach is home to the world's highest density of gear manufacturers and this is where F. Morat & Co. GmbH and our sister company Framo Morat GmbH & Co. KG call home.

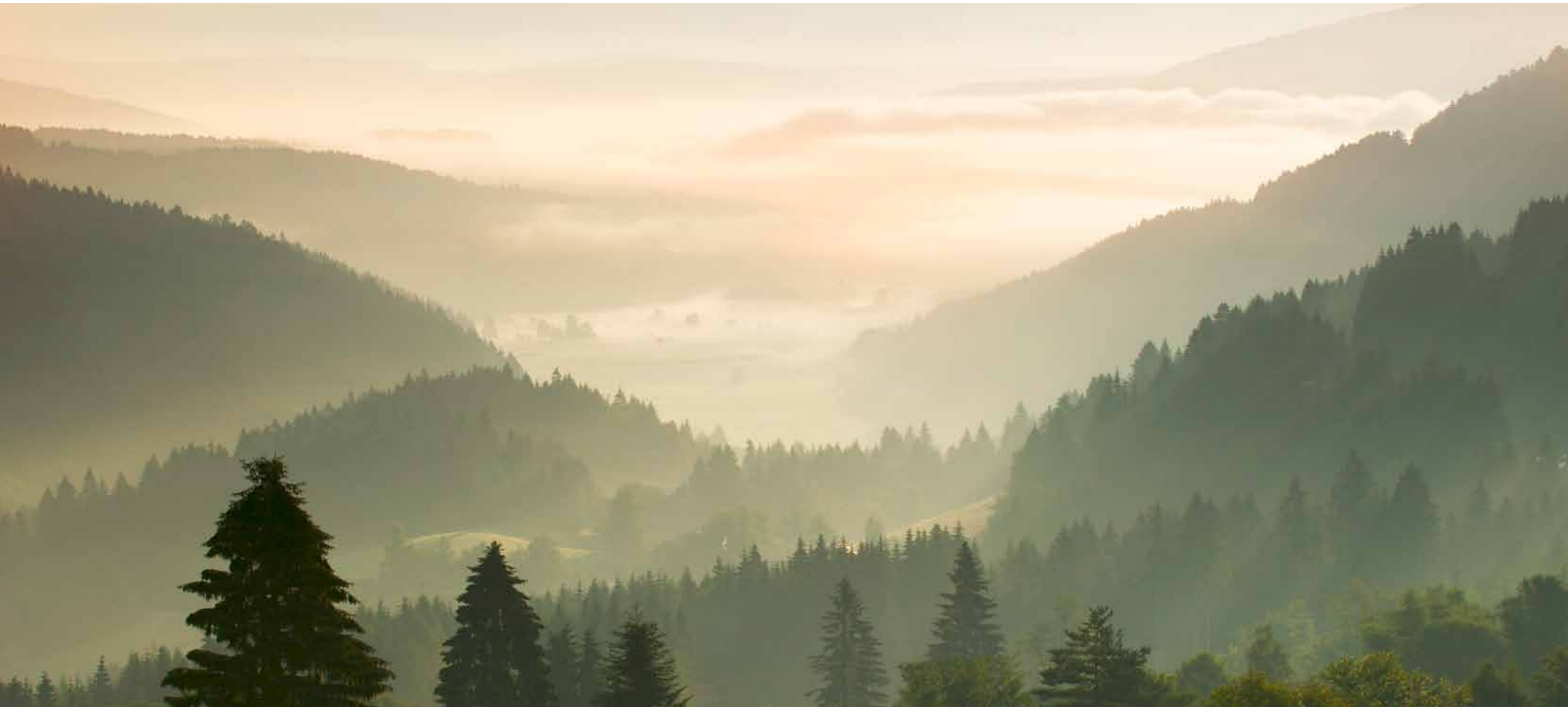
We inherited the Black Forest virtues of reliability and perfectionism from Johann Morat, who founded the first Morat company in 1863. Several generations later, we remain true to his legacy and feel proud to carry on the tradition of precision and quality that have made GearValley famous.



High-tech products in 1800.

What would the Black Forest be without the cuckoo clock? This is a fair question, since the clockmaking industry has been a key factor in the region's development into a center for cutting-edge technology.

GEARVALLEY 



Head start right from the start.

F. Morat is a pioneer in plastics engineering. The screw-type injection molding machine was invented in 1956. Company founder Franz Morat quickly recognized the value of this technology and began series production of injection-molded parts just a few years later in Eisenbach.

To this day, we have preserved and built upon the advantages that come with pioneering experience. For example, we entered the field of high-temperature plastics at an early stage, thereby securing an important competitive advantage for our company.

With our highly qualified & long serving employees our company can look forward to a bright future as we consider ourselves a modern, internationally oriented technology company with a keen awareness of its history. Furthermore, we intend to remain a leader in our field as a way to deliver value to our customers. F. Morat customers benefit from working with a highly experienced and capable partner who can help them find their own edge in the marketplace.

Franz Morat, Jr.

Company founder Franz Morat, Jr. quickly recognized the opportunities presented by new plastics technologies. With a strong sense of practicality, the courage to take risks, and an eagerness to listen to his employees' concerns, he laid the cornerstone for the success now enjoyed by F. Morat.



1963

The start of plastics processing at F. Morat company (founded in 1944). Oskar Haberstroh assumes managerial responsibilities.

1983

Entry into high-temperature plastics processing (PEEK™).

1999

Capabilities expanded to include the design, optimization, and production of plastic gears up to module 4.

1971

Expansion of production capacity with the construction of an in-house production hall, followed by more recent expansion to today's 5000 m².

1989

Fully assembled gearboxes are added to the F. Morat product line, covering everything from single parts to complete drive solutions.

2007/08

The Morat family assumes company shares. F. Morat and Framo Morat become 100% sister companies.

F. Morat – Facts, Figures, and Capabilities

- 5000 m² production area
- 50 injection molding machines with locking pressure up to 3500 kN
- Parts weights from 0.01 to 1000 g
- PEEK™ high-temperature plastic capabilities
- Multi-component injection molding
- In-house toolmaking

Everything but standardized.

Only the best solution will do.

At first glance our parts look like any other injection molded parts – but only at first glance. This is because you will never receive standardized, mass-production parts. Instead, all products are developed and manufactured specifically for certain customers and a particular application. We work closely with each customer to determine the right materials and manufacturing process and then agree on design and production details that precisely meet our customer's expectations.

We apply this philosophy equally to individual parts and complete drive units. At F. Morat we never slow down in our pursuit of the best and most economical solutions for our customers. As a result, we are able to manufacture products of truly outstanding quality and precision whose individuality makes them incredibly reliable and durable. Even if not immediately recognizable, products and solutions from F. Morat far exceed normal standards.

Gear parts

- All gear types
- Spur/helical gearing
- Modules 0.2 to 4
- PEEK™ material



Plastic/metal connections

- Combines the properties of metal and plastic
- Design optimization of the combination



Assemblies

- Product development
- Product selection
- Gear optimization
- Proper configuration for the type of plastic
- Precision assembly with tests/test marks



Technical parts

- Housing parts
- Complex geometries
- Multi-component engineering





Keeping it all in perspective.

As a start-to-finish partner, we make sure every piece fits.

An optimized product must do much more than simply comply with a list of specifications. The customer gets the whole package only in combination with a reliable and stable production process. For this reason, it is critical that every step in the process is carefully executed, beginning with product development. To ensure smooth series production, each part must be designed specifically for injection molding and then coordinated closely with the production method and tool design.

Over the course of several decades we have collected extensive know-how in development and production methodologies for individual parts as well as complete drive systems. Our customers benefit from this experience every time we develop a new product for them.

Our experience, paired with F. Morat's internal toolmaking capabilities, results in highly efficient and comprehensive solutions.

F. Morat – Your development partner for drive technology

- Gear configuration: optimization of the tooth geometry
- Proper configuration for the type of plastic: material matching, tolerances, injection-optimized design
- Optimized tool configuration and production

Custom development and project management:

Our customers choose F. Morat when they need a competent partner who can manage their entire project from development to series production.



Simultaneous planning of all processes:

In-house toolmaking capabilities provide for close coordination between development and production, resulting in comprehensive solutions.





A personal commitment to perfection.
Getting every detail right.

Not all plastics are equal – in fact, there is an incredible variety of materials and possible combinations. At F. Morat, we process all varieties of thermoplastics and use each one according to its specific properties. We are also prepared to consider special requests. F. Morat is one of the few manufacturers with the ability to produce precision parts with a wide variety of fillers and reinforcing agents in addition to the temperature-resistant PEEK™ material. Our knowledge & experience with such a wide range of materials ensures that the most suitable material is used for every solution.

Paying special attention to the avoidance of errors is another aspect of achieving optimal results. All processes at F. Morat are certified according to the ISO 9001 quality standard. This is extremely useful for detecting the sources of errors early and eliminating potential weaknesses. In the development stage, we utilize a technique known as Failure Mode and Effects Analysis (FMEA); during production we employ a variety of

technical monitoring and control systems, including internal pressure and temperature sensors, final part inspections, batch-specific sorting, Statistical Process Control (SPC), machine capability studies, and other testing criteria that are unique to specific customers. We know from experience that nothing delights customers more than flawless products. Our ability to utilize multiple methods simultaneously enables us to consistently achieve the quality expected of high-precision injection molded parts.

F. Morat – Uncompromising quality

- Close coordination between development, toolmaking, and production results in stable processes
- Preventative servicing of tools and systems
- Quality management certified according to ISO 9001
- Commitment to superlative quality. Main target: Zero defects

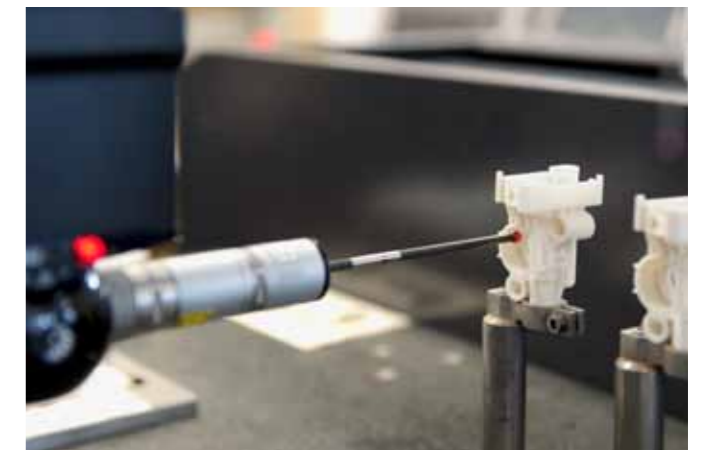
Is every detail right?

Individual parts are produced to extreme precision and consistency using processes defined for each customer.



Comprehensive quality assurance:

Our climate-controlled precision-measurement room contains 3-D measurement machines, optical measurement equipment, and surface and hobbing measurement devices for gear inspections.



Completely individualized.

To ensure that everything runs smoothly.

We offer a full spectrum of drive solutions, ranging from partially completed assemblies to complete, turnkey drives. Despite the large variety, we are able to maintain lean and efficient assembly through the use of the ergonomic workstations that maximize productivity. The results are technically and economically optimized units that have earned the label "Made in Germany".

For more than 20 years we have been continuously expanding our production and assembly capabilities, giving us a tremendous wealth of experience. In fact, we cover the entire process chain in-house, from ultrasonic welding to a variety of molding and press-fitting techniques to printing and final inspection. As a result, we have a unique ability to ensure that the various steps in the process fit seamlessly together.

F. Morat – Complete drives

- Partial and complete assembly, including motor, electronics, and final inspection
- Ultrasonic welding and soldering
- Printing

Every assembly and drive unit that leaves our factory passes through product-specific intermediate and final inspections that are established in direct coordination with the customer. All measurement and inspection data for every single drive are archived and can be retrieved at any time. Therefore, if the final customer experiences issues during operation, complete traceability is ensured.

Complete assembly:

We use advanced assembly equipment to produce a wide variety of drives.



Delivered with certificate:

Efficient assembly with traceable intermediate and final inspections ensure that our drive units will be very reliable in operation.





Customized solutions.

Variety is our strength.

Automotive

In the engine compartment (combustion air control), driver and passenger comfort (seat adjustment, power windows, climate control), and bearings for electric motors

Drive technology

In paper shredders, transformer stations, and table height adjustments

Medical and rehab equipment

In stair lifts, infusion and dental technology, and technical medical systems

Electronics and control

Security technology (lock drives), rotary encoders, limit switch units, and vending mechanisms

Control, climate, and ventilation engineering

Actuators for district heating systems, climate control, and pumping and heating



Our components, assemblies, and complete drives can be found in virtually every area of daily life, whether at home, in the car, or at the doctor. In most cases, they are integrated into a variety of equipment where they perform their tasks quietly and reliably and therefore without attracting attention.

Modern automobiles, with an increasing number of electrically driven systems, such as power seats, climate control, and combustion air control, are one of the most demanding fields of application for our drive solutions. Because automobiles are

produced in large quantities and stay in service for many years, extremely high quality and reliability are essential. Medical technology has similarly high technical standards. Medical systems that operate daily in a clinical environment for years are expected to exhibit flawless reliability. Drive solutions from F. Morat can be encountered in many other industries as well.

Variety is our strength:

With every new project, our customers benefit from our extensive experience and capabilities, gained from countless applications.



Benefit from the experience and knowledge that comes
from two hundred years of Black Forest industrial heritage.
www.gearvalley.com

F. Morat & Co. GmbH

Höchst 7a
79871 Eisenbach
Germany
Phone +49 (0) 7657 9106-0
Fax +49 (0) 7657 9106-40
E-Mail info@f-morat.de
www.f-morat.de

