

# PPS & hybrid technology

precision parts made of high performance plastic



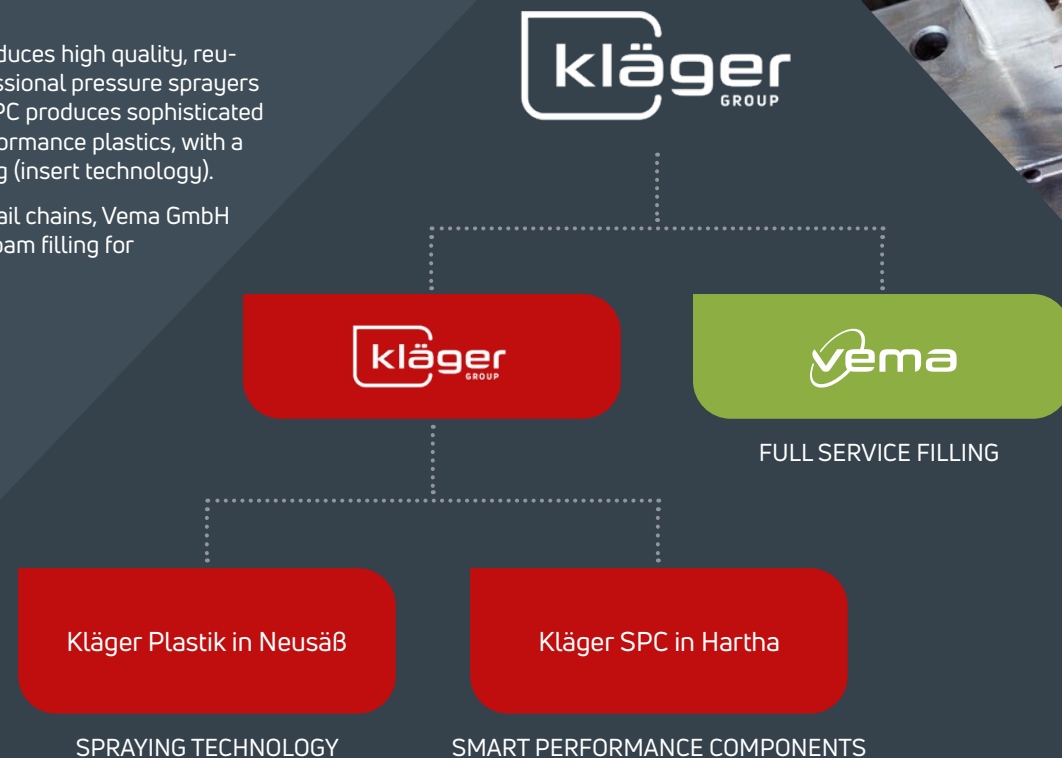
# The Kläger Group

## A STRONG CORPORATE NETWORK

Together, Kläger Plastik GmbH, Kläger SPC GmbH & Co. KG and Vema GmbH & Co. KG form the **KLÄGER GROUP**, a family run business in the third generation. The head office of both companies is located in Neusäß, near Augsburg in Bavaria. Kläger SPC is located in Hartha, Saxony.

Kläger Plastik in Neusäß develops and produces high quality, reusable spraying systems, particularly professional pressure sprayers and plastic bottles. In Hartha, the Kläger SPC produces sophisticated technical precision parts made of high performance plastics, with a focus on PPS and hybrid injection moulding (insert technology).

As a full surface partner for brands and retail chains, Vema GmbH & Co. KG specialises in aerosol spray and foam filling for cosmetics and medical products.



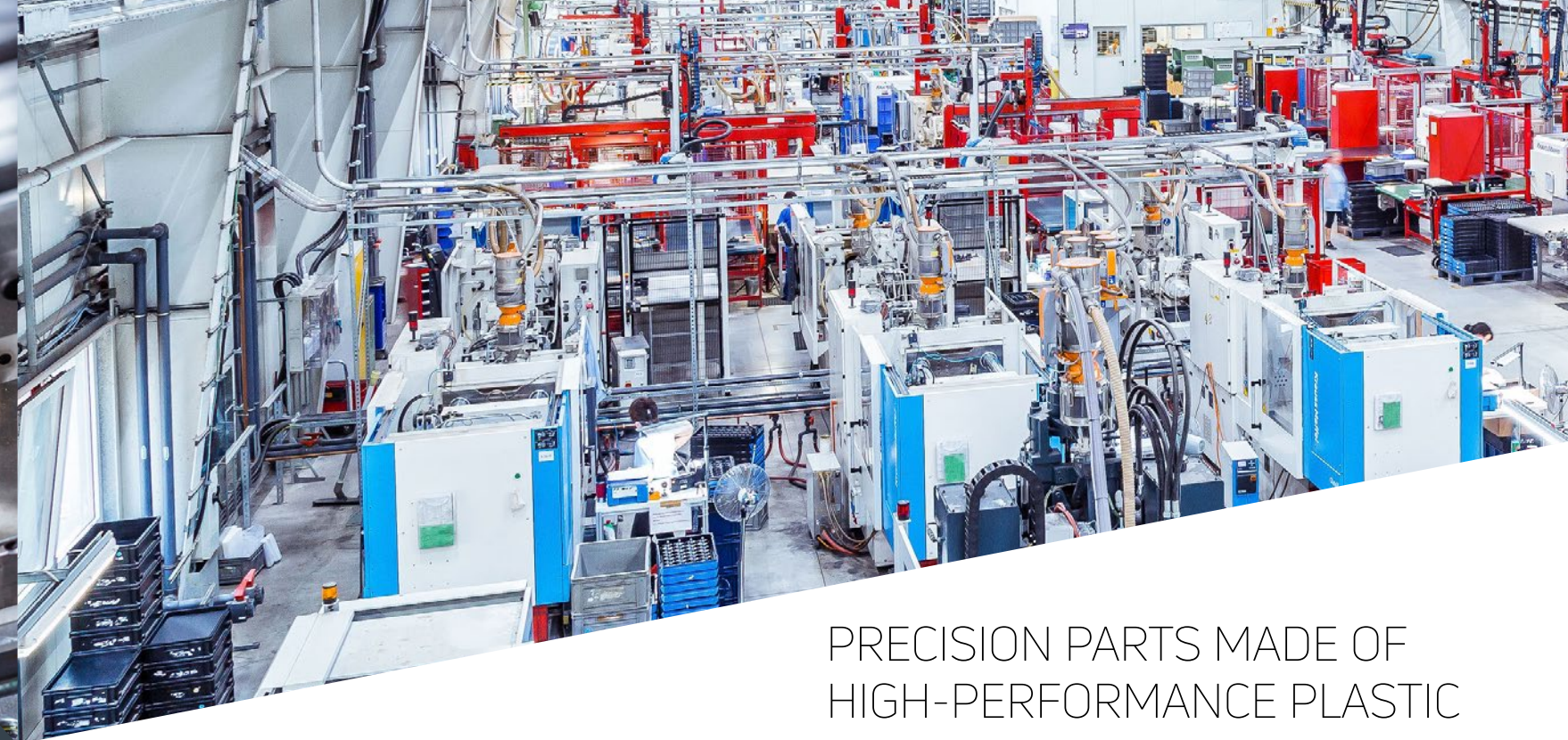
Kläger Plastik in Neusäß

SPRAYING TECHNOLOGY

Kläger SPC in Hartha

SMART PERFORMANCE COMPONENTS

FULL SERVICE FILLING



## PRECISION PARTS MADE OF HIGH-PERFORMANCE PLASTIC

Since 1992, Kläger SPC GmbH & Co. KG has manufactured sophisticated technical injection-moulded parts made of thermoplastic synthetic materials at its plant in the heart of Saxony. Our many years of experience in processing all kinds of technical plastics, with focus on high-performance plastics such as PPS, as well as plastic-metal hybrid technology, make us an efficient, reliable partner for our customers.

In addition to the manufacture of technically sophisticated parts for powertrains and product systems for fluid and thermal management, which can permanently withstand the specific stresses in the engine compartments, our expertise includes the areas of electronics and electrotechnology as well as pumps and engines.

## PPS & hybrid technology

# Transformation

## SHAPING TRANSFORMATION WITH HIGH PERFORMANCE PLASTICS

Our company has been shaped by our collaborations with automobile suppliers and development partners of first and second tier suppliers, and, consequently, by our experience of the injection moulding of sophisticated automotive and electronic components.

But just as vehicle manufacturers are evolving into mobility providers, following the paradigm shift of digitalisation, we are keeping one step ahead and paving our customers' way to a successful future through sustainable, exciting product solutions made of **high performance plastics**. In so doing, we assist them in the transformation of their product range.



### PLASTIC AS A SUBSTITUTE FOR METAL

Through our **precision components made of high performance plastics** we support mobility providers in the development of light-weight construction and emission reduction. Replacing aluminium, zinc or die cast metals with alternative technical, sustainable high performance thermoplastics contributes to weight reduction in the automotive world, which ultimately goes hand in hand with an increase in efficiency.

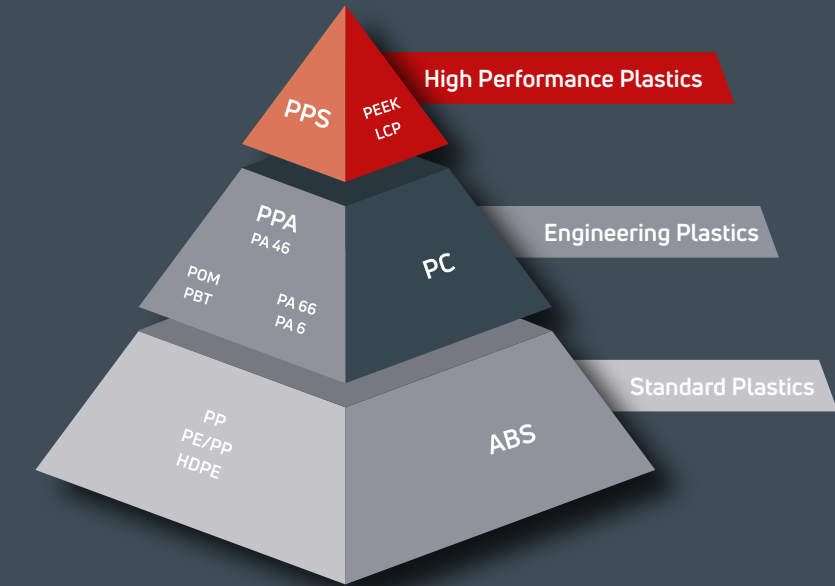
#### Advantages of performance polymers:

- High level of solidity and rigidity
- Higher integration of functions
- Better electrical conductivity
- No mechanical post processing steps or external surface treatments



Innovative **hybrid parts** are gaining in importance. These highly complex plastic/metal parts for bespoke, intelligent applications consist of at least two different raw materials. At Kläger SPC, this means in particular high-performance plastics and metal inserts such as electronic contacts, EloPin press fits, lead frames, axes and sleeves. The insert process technology enables us to combine the advantages of the materials metal and plastic into a solid, integrated component.

### HYBRID PARTS PPS / METAL



### HIGH-PERFORMANCE PLASTIC

**High-performance plastics** such as PPS score high with their outstanding resilience – a material category at the top of the plastic pyramid. In comparison to traditional technical plastics, PPS is more reliable and can withstand significant differences in temperature, extreme pressure and the long-term effects of aggressive chemicals, such as fuel.



# Industries

## DOMESTIC MARKETS AND INDUSTRIES

In addition to the automotive, transportation and electronic domestic markets, which we have been successfully supplying for more than 25 years, we see a significant potential for our high-performance plastic products in the growth markets of renewable energy, refrigeration engineering, in the field of alternative, environmentally friendly drive systems and engines (electric, gas, fuel cell) and a wide range of pump systems, as well as water technology and turbine technology.



### AUTOMOTIVE – CAR, TRUCK & BUS

**Domestic market and core sector:**

Components and product systems made of high-performance plastics for the powertrain (powertrain parts for internal combustion engines, hybrid & electric engines, plus fuel cells):

- Oil and vacuum pumps
- Circulating water pumps and cooling-fluid pumps
- Actuators, throttle valves and butterfly valves, plus variable valve control in general for load control
- Emission and thermal systems (fluid management)
- Magnetic valves (hydraulics, coolant and water valves, isolation valves)



### ELECTRONICS & ELECTROTECHNOLOGY

**Symbiosis in plastic:**

Controllable, intelligent components and units made of high-performance plastics for vehicle electronics and much more besides:

- Injection moulding of electrical components (hybrid injection moulding/insert technology)
- Connectors and plug connectors (SMT, FPC, HSD, Fakra, Floating)
- General PCU and ECU settings
- Switches/encoders and relays
- Intricate mounting elements of electronic components
- Mechatronics and body, insulating and carrier elements
- Brush systems and winding components
- Chips, semiconductor, cable harnesses



### PUMPS & ENGINES

**Focus on off-road – beyond the automotive sector:**

Pump parts and engine components made of high-performance plastics for electric engines, batteries and fuel cells, plus turbines for:

- Agricultural machines
- Rail traffic
- Shipping and aviation
- E-bikes and new types of mobility



### INDUSTRY

**Designed for continuous use:**

High-performance, solid components and parts made of high-performance plastics, designed for maximum reliability:

- Stationary engines
- Machine and plant construction
- Control box components
- Professional spraying technology
- Packaging and consumer goods
- Household appliances and tools

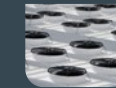


### NEW CLEAN ENERGY

**With the future in mind – plastic is expected to be high-performance:**

Technical precision components and product systems made of high-performance polymers for the renewable energy sector:

- Wind and hydropower
- Solar (PV/thermal/collectors)
- Storage technology



### HEATING, VENTILATION, CLIMATE, REFRIGERATION

**Rethinking supply engineering:**

Our precision and practical know-how also generate added value in the key fields of heating, ventilation, climate and, in particular, refrigeration:

- A variety of pump components, e.g. body, lid
- A variety of valve components
- Wiring
- Sensors
- Components for heat exchangers and vaporisers
- Connecting components for circuits with glycol mixtures



### WATER TECHNOLOGY

**Resistance and durability in fluid-carrying plastic parts:**

Technical components and intelligent parts made of high-performance plastics to defy the elements:

- Filtration
- Water meters/smart metering
- Pond and pool technology
- Sanitary technology





# Global

## LOGISTICS & AFTER-SALES SERVICES

We ship our products throughout the world. To do so, we organise global shipping as sea and air freight, or by road. The technical precision parts made of plastic that leave our factory in Saxony are exported to destinations as far away as Mexico or China.

As a global exporter, Kläger SPC has wide-ranging expertise in international trade, including deliveries to consignment warehouses. We can also issue the certification of known consignor for Authorized Economic Operators (AEO) for our customers,

and accompany you on your way. This is how we contribute to a smooth shipping process. It goes without saying that we also support our customers after delivery with our comprehensive after-sales services, and are ready to answer any questions they may have about our products.

## OUR EXPERTISE AS A FULL-SERVICE PARTNER

For us, expertise in plastic means much more than just expertise in injection moulding or extrusion blow moulding processes. Our services also include development and 3D CAD construction, our own in-house toolroom, component assembly and the implementation of automation processes.

In addition to this, we offer our customers comprehensive, personalised support and product consultations. We see ourselves as full-service partners, starting with an initial idea and taking it all the way to being ready for marketing and large-scale manufacture, not forgetting the logistics of shipping it throughout the world.

# Full-service partner





# Engineering

## DEVELOPMENT, PRODUCT DESIGN AND CONSTRUCTION

Every project starts with an idea. Even at the development phase, we work at five modern 3D CAD workstations (SolidWorks), in order to visualise and simulate new products and tool concepts as applicable. This is how we guarantee product development that is both suitable for manufacture and cost-conscious, with innovation and know-how that corresponds closely to what our customers want.



### OUR SERVICES:

- Design drafts and feasibility studies (e.g. filling simulations)
- Carrying out of producibility assessments
- Test planning and pre-production testing
- Creation of prototypes (in injection moulding or as additive manufacturing in 3D printing)
- Systematic optimisation of capacity and follow-on tools in large-scale production
- Encrypted data transfer (customer-specific interfaces, OFTP2, personal SharePoint)
- Data formats (including SolidWorks, Catia, STEP214, Parasolid)



# In-house

## TOOLROOM

**Top quality and maximum precision:** our tool and mould shop, which runs parallel to our manufacturing processes, has extensive expertise to rely on when it comes to the construction and production, systematic maintenance and repair of all operating equipment needed for production. The items we ourselves manufacture include injection moulds for processing high-performance plastics, and, with our modern machinery, we can also produce bespoke devices that meet the needs of our customers.

We have a reliable network of partners and manufacturing technologies that enable us to realise large-scale projects within a tight timeframe. The combination of these elements are the key and decisive core competence required in order to take on complex challenges in the field of plastic processing.



## MACHINERY

### Tool construction and programming

- 5 CAD / CAM workstations (SolidWorks, Peps, Hypermill)

### EDM technology

- 1 wire erosion machine (GF Evolution3)
- 1 die sinking machine (Agie Mondo 50)
- 2 die sinking machines (GF Integral2 and GF Form 3000 HP)

### Milling technology

- 1 NC milling machine (Maho MHC 700)
- 1 conventional milling machine (Micron)
- 2 CNC 5-axis milling centres (DMG und Mikron)
- 1 CNC 3-axis milling centre (Deckel)
- 1 CNC 3-axis milling and drilling machine (Fehlmann)
- 2 conventional milling machines (Deckel)

### Grinding technology

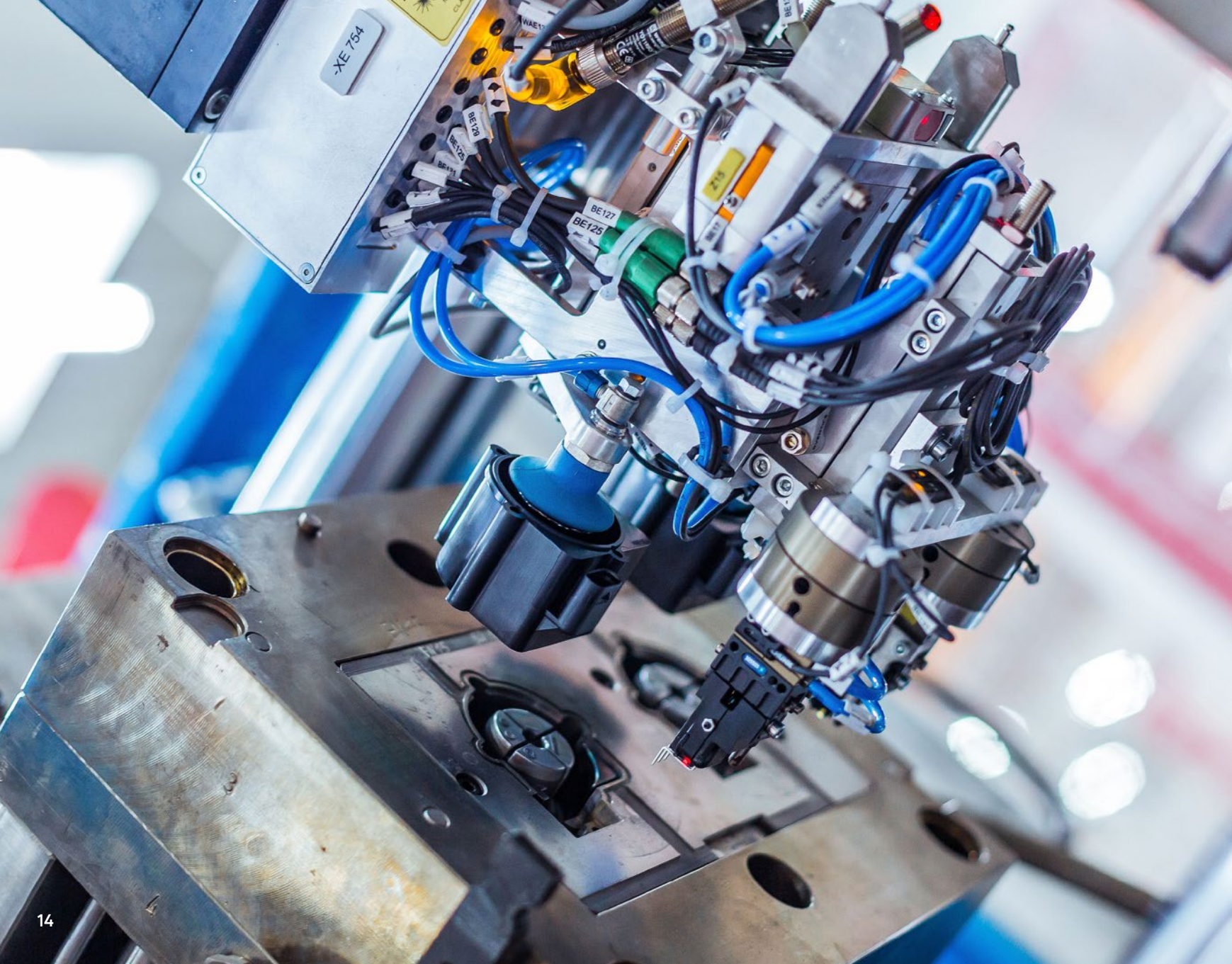
- 1 flat grinding machine (ELB)
- 1 round grinding machine (VEB)
- 2 coordinate grinding machines (Hauser)
- 2 flat grinding machines (Jung und Stankoimport)
- 1 round grinding machine (Studer)

### Turning technology

- 2 conventional turning machines (Weiler)
- 3 conventional turning machines (Leinen und Tos)

We can manufacture tool sizes up to 750 x 500 mm in our inhouse toolroom; larger variants are also possible in collaboration with our external partners. We can move a maximum tool weight of two tonnes.





# High-performance plastic

## PRECISION AND HYBRID INJECTION MOULDING

Our team of specialists produces sophisticated precision components with a high level of dimensional tolerance and surface consistency on 70 injection moulding machines from the renowned manufacturers KraussMaffei, ARBURG, DEMAG and ENGEL. For over five decades, we have processed plastics such as PA, PP, POM and HDPE.

Notably, we have become experts in the injection moulding of the high-performance plastic PPS. We are also able to precisely inject on-mould delicate metal inserts such as plugs, axes and contacts (hybrid injection moulding or insert technology).

**PPS:** Kläger SPC is one of the largest processors of the high-performance plastic PPS in Europe, processing more than 700 tonnes of synthetic granules and manufacturing more than 600 million plastic parts each year.

**CORE EXPERTISE IN INSERT TECHNOLOGY:** Thread inserts, plugs, contacts or axes are injection moulded with plastic. This is carried out during the process either manually or fully automatically, using robots.

### MACHINERY

#### Horizontal hydraulic injection moulding machines

- 17 machines with 25 to 50 tonnes of clamping force
- 43 machines with 80 to 130 tonnes of clamping force
- 7 machines with 200 to 250 tonnes of clamping force

#### Horizontal electric

- 2 machines with 50 tonnes of clamping force

#### Vertical hydraulic with rotary table (Rotari/Insert)

- 1 machine with 100 tonnes of clamping force



# Full Package

## COMPONENT ASSEMBLY & MANUFACTURING AUTOMATION

We deliver more than just separate parts – we provide a complete package. We process the plastic pieces into components, either directly on the machine or in downstream production lines. We use a balanced combination of automation and manual assembly workstations, depending on the requirements and complexity involved.



### OUR TECHNOLOGY:

- Automation solutions for the manufacture of metal inserts (hybrid injection moulding or insert technology)
- Automated sorting upon customer's request
- Various collaborative robot and automation systems on the injection moulding machines, including for precisely positioned removal (e.g. in trays)
- Various automated quality control systems (including optical controls via camera, via vacuum, leak and burst testing systems, weight controls)







# Highest

## QUALITY STANDARD FOR HIGH-PERFORMANCE PLASTIC

Our systematic quality assurance and the integrated certified processes in compliance with ISO 9001 (quality management) and ISO 14001 (environmental management) guarantee that we can meet customer requirements while complying with industry norms and legal standards. This starts from the quotation and projecting phase and continues through the assessment of tolerances and customer specifications. The continual documentation of the process, along with our many years of expertise and practical know how, form the basis of the detailed producibility assessment.

### Quality assurance services at a glance

- Process FMEA
- Comprehensive feasibility studies
- Sample tests in compliance with IATF 16969 (Initial Sample Test Report and PPAP)
- Testing schedule and quality assurance throughout production
- Dedicated contact person or quality manager

### Certifications at a glance:

ISO 9001  
ISO 14001  
IATF 16949



The systematic inclusion of our quality assurance in all of our processes helps us to recognise the potential for error and risks at an early stage. We do not test quality, but instead we prove that we produce quality in the large scale manufacture of complex plastic parts. At the same time, we always keep the requirements of the IATF 16949 regulations in mind and design our quality competencies and customer services to precisely meet those requirements:

### Technology/Equipment

- CAQ system permanent process monitoring
- Minitab process capability analyses and statistical data collection and analysis
- 3D coordinate measuring machine Zeiss Contura G2 with Calypso measurement software
- 3D multi sensor coordinate measuring machine Werth Scopecheck
- Optical & video measurement microscope Vision Swift Duo Dynascope
- Automated processes and 100% testing process monitoring (optical/vacuum among others)
- A range of leakage test stands and bursting pressure test stands
- A range of measurement equipment specific to the products



# Our USPs

## 8 REASONS TO CHOOSE US

### **IN-HOUSE DESIGN**

Keystone for realising customer projects

### **IN-HOUSE TOOL CONSTRUCTION AND INTERNATIONAL NETWORK**

Complete flexibility

### **FROM SMALL BATCHES TO MASS PRODUCTION**

All customer requirements can be met

### **MADE IN GERMANY**

Commitment to quality

### **AUTOMISATION**

Option of complete component assembly

### **SUSTAINABILITY**

Corporate social responsibility,  
photovoltaics, green electricity

### **MEDIUM-SIZED FAMILY BUSINESS**

Flexible, fast, pragmatic, working  
closely with our customers

### **COMPREHENSIVE CERTIFICATION**

ISO9001, ISO14001, IATF 16949

»THE REQUIREMENT FOR CREATING  
ABSOLUTELY PRECISE COMPONENTS IS  
HAVING CONTROL OVER PROCESSES,  
ALONG WITH DESIGN AND DEVELOPMENT  
KNOW-HOW«





**Jens Heinecke**  
Head of Sales (Key Account Manager)  
Sales Project Management  
Phone: +49 (0)34 328 700 146  
Mobile: +49 (0) 151 54964018  
jens.heinecke@klaeger-group.com



**Ronny Langer**  
Head of Development & Design



**Steffen Richter**  
Head of Tool & Mould Making



**Denny Fuhrmann**  
Head of Plastic Injection Moulding



**Denise Fischer**  
Head of Human Resources

# Contact

## WE ARE HERE FOR YOU

Our team of specialists **supports our customers throughout the entire product life cycle**, from the initial idea and request for quote to the planning of follow on tools and capacity tools in large scale injection mould production.

- Close collaboration with our internal development and design department, as well as with our in-house toolroom
- Key account management as the central point of contact for experts and decision makers on the side of the customer
- Comprehensive product project planning

We want to be the partner that uses experience and know how, plus passion and innovative spirit, to create bespoke, efficient solutions for our customers Our key account management is always happy to advise you!

**Just contact us!**

Kläger SPC GmbH & Co. KG  
Sonnenstraße 31  
04746 Hartha (Germany)  
Phone: +49 (0)34 328 700 0  
info-kspc@klaeger-group.com  
klaeger-group.com

For more information



SCAN ME





Traditional and family business – since 1980  
made in germany

SMART PERFORMANCE COMPONENTS

Kläger SPC GmbH & Co. KG  
Sonnenstraße 31  
04746 Hartha (Germany)  
Phone: +49 (0)34 328 700 0  
info-kspc@klaeger-group.com  
klaeger-group.com