

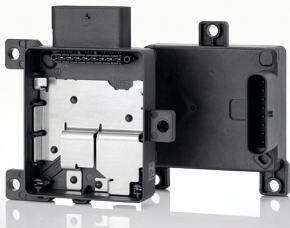
# MOBILITY SOLUTIONS

## TRENDS & CHALLENGES

Evolution of electric drive technologies, maximum connectivity on the way to autonomous driving, functional quantum leaps in infotainment and driver assistance systems, as well as the development of intelligent traffic systems, are leading to constantly growing demands on components and thus on the supplier industry. Interconnection technologies and sensor technology are becoming more and more central and are subject to ever changing and growing demands: the miniaturization of electronic components requires ever tighter tolerances while

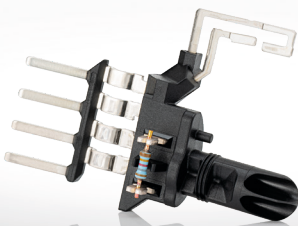
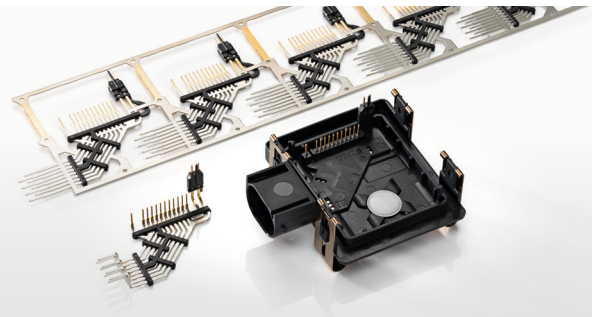
quality requirements are increasing at the same time. In order to meet this as efficiently as possible, development and manufacturing competencies at the highest level, combined with maximum process reliability are key to success.

As high-performance toolmakers, we are experts in precision and put our own demand for perfection into practice, even in highly complex series production. That is why we are the all-in-one solution partner along the challenges of the automotive and mobility industry.



### PLASTIC METAL HYBRID MOLDING

- Combination of reel-to-reel, pre-forming, leadframe & automation with robots
- Fully automated process:
  - Integrated stamping-bending processes
  - Component cleaning
  - 100% in-line quality inspection
  - Laser marking
  - Assembly processes



### FLAT CONNECTOR ASSEMBLY WITH INTEGRATED RESISTOR

- Strip plated stamped part with reel to reel overmolding
- Fully automated production line up to packaging
- Integration of electronic components
- 100% quality monitoring in-line incl. electrical testing
- Flexible production concept for variant production

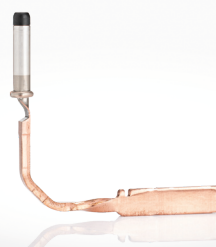


### ROLLED SPRING MADE OF HIGHSTRENGTH STAINLESS STEEL

- Gap-free bending process
- Safe removal of the punching burr with separate brushing process
- Fine cleaning for highest cleanliness requirements

### HIGH-VOLTAGE PIN WITH MOUNTED CONTACT PROTECTION CAP

- High currents due to high material cross-sections
- Step-milled strip
- Selective precious metal electroplating
- Single-stage manufacturing concept with assembly of the plastic cap in the progressive die
- 100% quality control in-line



### MICROSTAMPED PART

- Special production at the limits of technical feasibility
- Oblique punched injection holes
- Tolerances in the  $\mu\text{m}$  range



## KRAMSKI AT A GLANCE

>40

YEARS OF EXPERIENCE &  
BEST MANUFACTURING

>3 BN

STAMPING & PLASTIC-METAL  
COMPOSITES PER YEAR

4  
WORLDWIDE  
LOCATIONS

GERMANY, USA, INDIA &  
SRI LANKA

### CERTIFIED QUALITY

IATF 16949

ISO 9001

ISO 14001

ISO 50001

### OUR COMPETENCIES

- DEVELOPMENT PARTNER FOR PRODUCT AND PROCESS OPTIMIZATION
- SINGLE-STAGE PRODUCTION WITH DIFFERENT MATERIALS AND THICKNESSES
- HIGHEST FLEXIBILITY AND PRODUCTIVITY IN COMPLEX GEOMETRIES

### THE KRAMSKI SOLUTION

## STANDARDIZED & CUSTOMER SPECIFIC

The series production of highly complex components for mobility applications requires advanced machining know-how, targeted process development and the most precise manufacturing quality. Together with our customers, we realize projects of the greatest complexity. We offer both standardized and completely customized connection solutions. From on-board connectors

for HV and RF applications, shielding and housings, to components for sensors, battery management systems, cell contacting and charging infrastructure, to traditional engine components for combustion engines – there is a KRAMSKI solution for every mobility application.

## 4 REASONS FOR KRAMSKI

①

### MAXIMUM EFFICIENCY

Efficiency-optimized output thanks to long tool-life and high stroke rates

②

### GLOBALLY CONNECTED PRODUCTION

Maximum flexibility thanks to globally positioned value creation

③

### COMPREHENSIVE DEPTH OF PRODUCTION

Holistic view and processing of projects across all levels

④

### 100% INSPECTION POSSIBLE

Uncompromising quality management at all stages of the project

Like no other partner, we answer our customers' challenges with our more than 40 years of experience in high-performance toolmaking and series production of the most complex parts. Our extensive technical know-how complements our ability to develop specific solutions and adapt tools and manufacturing processes to the individual needs of our customers.

The realization of highly complex geometries, material combinations and dimensions with the tightest tolerances is our strength. Our constant striving for perfection makes us the ideal partner for the development and series production of the perfect mobility solution. Together with you, we move the future and develop mobility further.