MODULAR „TURN-KEY-SYSTEMS“ FOR THE PRODUCTION OF METALL/PLASTIC HYBRID COMPONENTS

METAL MEETS PLASTIC
OVERVIEW OF THE COMPANY AND SERVICES

The company:

MMS was founded in 2008 by Peter Buxbaum as a full service supplier for machine systems to serve the growing market for the production of metal/plastic composite components. Of course there are other companies active in this market segment, none of which, however, can serve the complete process chain. Even today MMS still has this unique selling point.

As a result of more than 12 years of experience in the industry and the very good international contacts, new developments and international sales successes could be achieved in a very short time.

In 2009 MMS was awarded the innovation prize „Creative into the future“ by the Austrian chamber of commerce for the technical innovation of the year – the patented injection moulding modules.

The company was certified according to EN-ISO 9001 in May 2012, in the meantime two surveillance audits have been conducted in which the company’s Quality Management system was confirmed.

Since 2013 the company is located in Berndorf where investments have been made in a modern tool making shop. In addition to experienced staff, toolmakers and mechatronic technicians are trained.

The design is done on three 3D CAD workstations (Solid Edge), all MMS machines, tools and modules are designed in 3D.

Since the company was established the R&D investments have been way above 10% of the total revenue.

About our customers

MMS supplies exceptional technology to top companies in the electrical and automotive supplier industry. This know-how in hybrid technology means that MMS, this small company, is not just a supplier but also a development partner for globally leading companies in the respective industries. Following the motto „from draft to product“ customers are advised with respect to economical product design, machine design and process optimisation and supported for various FMEA’s.

Our customers:
**About our products:**

The main difference between MMS and other machine and equipment suppliers is, that all the production processes for manufacturing complex composite components are looked at holistically and, as a result, the customer gets a proven turnkey manufacturing system.

In doing so the manufacturing equipment is built up on a modular base, processing modules are, among others, available for following technologies:

- **Stanz**
- **Biegen**
- **Nieten**
- **Schweißen**
- **Umspritzen**
- **Prüfen**
- **Montieren**
- **Beschriften**

As a result MMS manufacturing equipment is a customer and product optimised solution based on standard single modules and thus exactly in the middle of the road between standard and special machines and have the advantages of both categories.

**About our products:**

A few examples of complete MMS hybrid machines:

- **Machine for hybrid parts with a feeder for varistors with integrated welding process**  
  (Location: France)

- **Machine for housing contacts with welded silver contact**  
  (Location: Germany)

- **Machine for punching, welding, riveting an encapsulating safety components**  
  (Location: Germany)

- **Machine for punching and injection moulding of housing components with extremely high cycle rate.**  
  (Location: Great Britain)

- **Test machine for punching, injection moulding and final processing of hybrid parts.**  
  (Location: Austria)

- **RT-Transfer machine with 2 injection moulding modules for co-axial plugs with 8 processing stations**  
  (Location: Germany)
Details on our products – Machine control:

Since the company was established intensive work has been done on an MMS machine control tool. Objective was to develop an extremely universal control and drive tool that could be used for linear and transfer systems. The complete injection moulding system also runs on an MMS software package.

Today the software is so flexible and universal that it can be used to control handling systems, Scara robots, test systems and packaging systems. For basic maintenance and service purposes the software can also be supervised remotely via the internet.

Details on our products – Injection moulding module:

The patented injection moulding modules with the 2-stage injection units are the core competence at MMS. Meanwhile there is an injection moulding module for encapsulating in a belt (MMS offers the only system worldwide with two opening levels) as well as for the encapsulation of single parts in a transfer mode. In doing so either the complete tool base can rotate or only the mould inserts with stationary tools. As a result of the compact construction and the ingenious drive technology several modules can be attached to each other, for example, in order to manufacture substrates and finished parts, or hard and soft components on one machine. In spite of the very robust design these modules stand out with a very compact structural form. As a result of the special drive and controlling technology, coupled with the precise mechanical processes, highest manufacturing performance can be achieved, in special applications more than 190 hybrid components per minute can be produced.
Details on the products – Press modules:

MMS press modules are used for the most divers punch and bending tasks, in order to process belts or single components before or after encapsulation. These modules can either be used as „stand-alone machines“ or directly at the linear or transfer units. The press modules are available in different sizes and tonnages. The trick is that exactly identical drive systems are used as in the 3- and 4- column injection moulding modules, as a result the number of manufacturing parts can be significantly reduced. As a rule progressive compound tools are used in the press modules.

If necessary the mounting plate can be manufactured to customer requirements to enable the removal of the components directly from the tool by robots or handling system.

Details on the products – Welding technology:

Various welding systems are used on MMS manufacturing machines, in doing so welding devices and grippers from different manufacturers are integrated into the machine. Here the know-how lies in the integration of standard systems and in the clear structure with a maximum of user friendliness. In doing so micro stroke measurement systems and force measuring systems are used. Usually medium and high frequency controllers are used as a power supply, the operational process data collection can be done directly using the MMS machine software.
Details on the products – Testing technology:

Camera inspection stations and optical measurement systems are integrated into the MMS manufacturing systems for 100% quality control. After this a high voltage test can also be integrated into the unit or conducted at a separate testing station.

Camera inspection station for contacts on a strip
Test station for high voltage testing

Details on the products – Robotics, handling systems and gripper technology

Cycle time oriented, effective and above all reliable placement and removal of components and assemblies are crucial for the manufacturing performance of a production unit. At MMS various handling systems are taken over in the module building block system. The programming (e.g. positions, speeds, ...) can be done directly using the new MMS machine control without any programming knowledge. The design and manufacturing of the gripper, the heart of the handling system is done at MMS.

For a complete quality control camera systems can also be integrated into the handling in order to ensure, e.g. that all parts have been removed.

The handling systems are usually driven by servo electric or linear motors. These guarantees highest precision, high dynamics and almost wear-free operation.

Gripper system for metal/plastic hybrid components with feed plate.
Gripper system at portal handling with additional rotate axis for parts inspection.
Scara robot for parts removal directly from the punching tool and placement in the injection moulding tool with camera inspection.
Details on the products – Packaging technology

More and more often components – especially when they are metal/plastic components, have to packaged in blister to protect the components and also for ease of further processing. It can be either “endless“ blister belts or also blister trays. For both possibilities MMS offers modules for the respective units whereby the customer receives final packed and positioned components. To protect the components on the “endless“ tapes an additional foil is welded on.

Details on the products – Tool and die making

MMS is not just a process developer and system manufacturer it also has its own competences and capacities to develop and manufacture injection moulding and press tools. Consequently MMS is in a position to offer the complete optimally dovetailed system technology from one source excluding any interface problems.

For this reason MMS has set up its own tool and die making facility.

Larger CNC machining and electrode manufacturing (HSC milling of copper and graphite electrodes) is done at local and international vendors

Injection moulding tools for MMS injection moulding modules
Left: 16x high performance tool for LCP housing
Right: 6x high temperature tool (tool temp. 160°C)

Punches and progressive tools for press modules
Left: Pre-punch before encapsulation
Right: Bending/separating tool after overmolding
Details on the products – Fixture construction

Depending on the task set MMS designs and manufactures customer specific fixtures, jigs, prototype tools, gripper systems and inspection equipment. These are made with the same high degree of accuracy as the MMS punch and injection moulding tools. As an option special prototype tools can be manufactured and delivered in an extremely short time, the manufacturing of the parts can also be done at MMS.

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