



Inductive Systems

for the Automotive Market



Tyco Electronics Ltd. is a leading global provider of engineered electronic components, network solutions and wireless systems, with customers in more than 150 countries. We design, manufacture and market products for customers in industries from automotive, appliances and aerospace and defense to telecommunications, computers and consumer electronics. With over 8,000 engineers and worldwide manufacturing, sales and customer service capabilities, Tyco Electronics' commitment is our customers' advantage.

GLOBAL AUTOMOTIVE DIVISION INDUCTIVE SYSTEMS

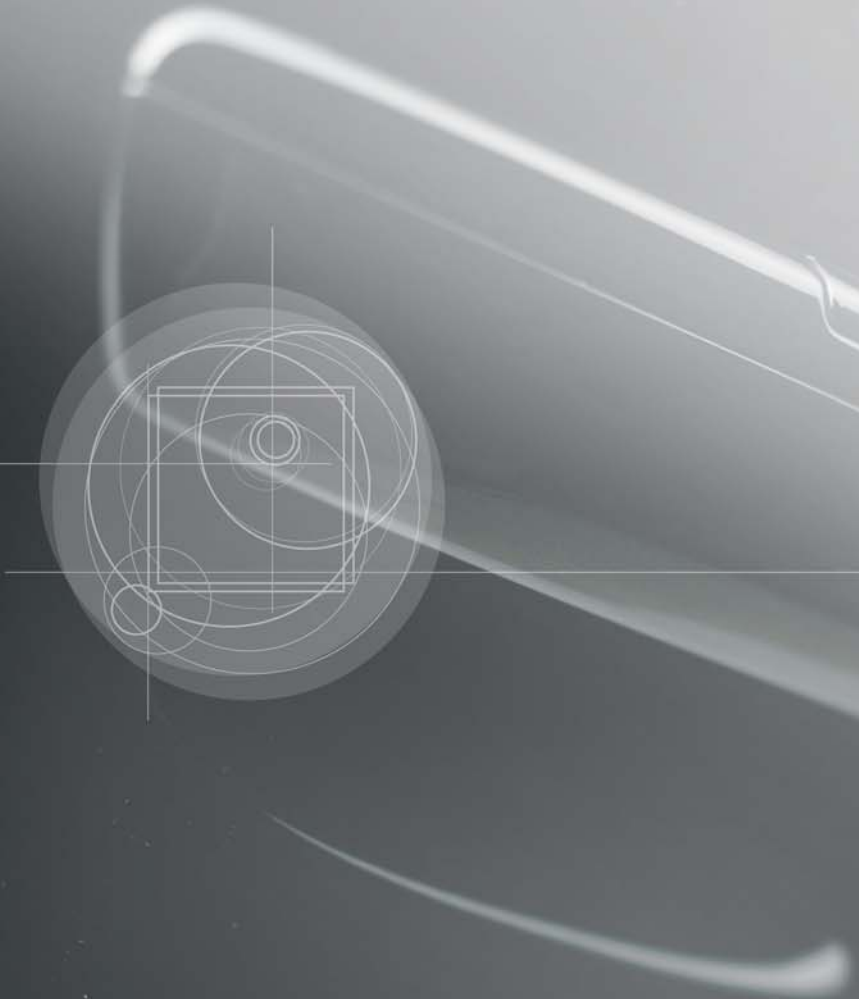
The Global Automotive Division is your source for interconnection and wireless technologies for automotive, truck and off-highway OEMs and Tier 1 suppliers. With the design competency center in Oostkamp, (Belgium), and strategic production centers in Evora (Portugal), Bangalore (India), Shenzhen (China), and Oostkamp (Belgium), Tyco Electronics Inductive Systems is ready to offer you any LF-application component required in the automotive branche.

The Inductive Systems groups focus is on the customer requirement in order to design to the exact demand. This is achieved by high-technological, intelligent and cost-efficient engineering. In order to be a leader in design, Tyco Electronics Inductive Systems has a vast product portfolio, which consists out of antennas, actuators and integrated modules. Next to that, several specific applications are designed. For non-experts this could be read as magnetic coil applications for the automotive industry.

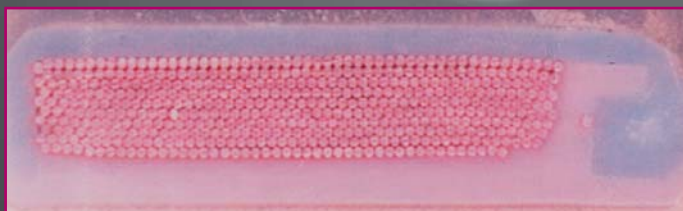


AUTOMOTIVATED IN EVERY DETAIL

Our global automotive research centers are setting the technological landscape by developing new technologies, products and production processes. The increasingly fast growing number of functions in present and future cars require varieties of powerful and versatile connection systems. We compare existing standards with alternative possibilities in which costs, functionality, dependability and serial production are the basics of our procedures.



*Multispring or
ACTION PIN
inhouse pressfit
technology*



Orthocyclic winding with special designed Rill-pattern



*R-welding coilwire
connection
technology*

TECHNOLOGY

The technologies used for the Inductive Designs are mainly the following:

- **Thermoplastic molding:**

A variety of high demanding plastics is used to envelop the critical components and attachment features of the IS components

- **Coil winding:**

Different shaped wire cross-sections from 0.05 until 1.5 mm diameter can be handled and winding installations for diverse application temperature conditions

- **Connection technologies:**

To have a stable product the connection between coil wire and coil terminal, between coil terminal and cable are significant. Therefore the choice of the right connection technology and the knowledge of processing is very important and treated as inhouse competency of the Inductive Systems group



Orthocyclic wound coil with Multispring-Pressfit PCB-connection technology and R-welded wire-connection technology

- **Assembly and component integration:**

Going from integrated connectors to electronic components and complete PCB's to give the maximum of functionalities to the products

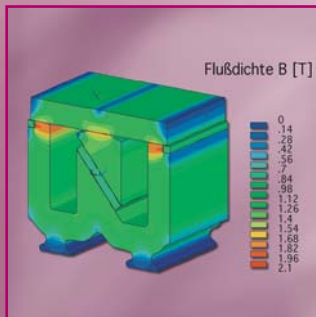
- **Overmolding or potting:**

Sealing or protecting the vital organs of the modules to the working environment (exterior applications, engine environment, etc)

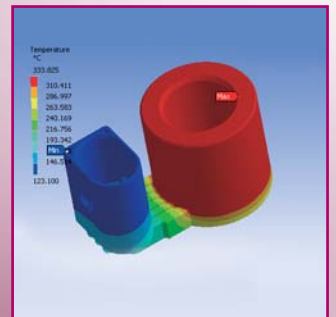
- **Testing:**

All products are tested to ensure the produced quality level with highly specified equipment. All above-mentioned technologies are in-house competencies, which are fine-tuned to the specific product portfolio in order to have an optimized product

The key to success in our products lays in the compatibility of these technologies with our competencies.



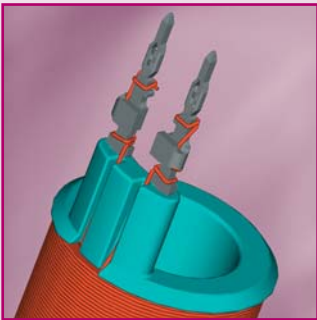
Magnetic simulation



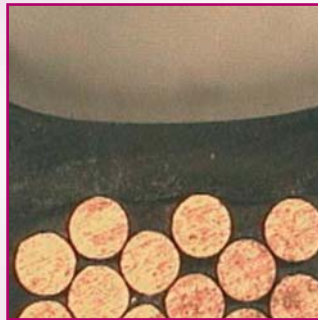
Thermal simulation

COMPETENCIES

The coil design is a demanding challenge for engineering specialists. Not only the mechanical design is very specific and volumetric bounded, also the magnetic and electric properties have to be covered with know-how and design experience. Therefore the over 10 years design experience in our competency center in Belgium contributes to the optimum products. The design group is specialized in magnetic, mechanic and thermal simulations to decrease design lead-time and error possibilities. The magnetic simulations outrule possible interferences with other vehicle systems and EMC requirements. Mechanical simulations ensure correct mold and part dimensions to maximize the strength of attachment features and mechanical load specifications in the harsh temperature conditions.



Orthocyclic wound coil with "hotstake" connection and pressfit technology



Detailed prototyping investigations

OVER 10 YEARS DESIGN EXPERIENCE

The engineering department has a local process design group which is responsible to couple the product designs to available automation solutions on the market and standardize process cells.

APPLICATIONS

The very highest level of functional integrity is of the highest importance in life-saving applications such as ABS. Integrated system solutions are an important step towards this goal. Our system integrates all functions into a single block of electronics in just one plastic housing. This means that the risk of failure is reduced almost to zero. Fuel injection systems are in place where space is an absolute limitation. We supply the smallest injection coils on the market. Antennas for immobilizers find their application in anti-theft systems and immobilization systems.

- **ABS / VSC module for brake assist and stability control:**
Inductive coils are embedded in a mechatronic housing. The assembly process is fully-automated
- **Immobilizer antenna:**
Integrated module for transponder electronics and coil in one housing
- **Injector coil:**
High performance miniaturized injector coil for direct and indirect injection
- **Tyre pressure monitoring system trigger antennas:**
The interface between the central receiver and the tyre sensor
- **Wheel speed detection for high temperature turbo chargers**
- **Wheel speed sensors for ABS-systems**
- **Seat detection systems**
- **Actuator coils for variable motor valves, gear changing or other applications**

RELATED TECHNOLOGIES



MECHATRONICS



TERMINALS &
CONNECTORS



The ABS modules consist of a waterproof assembly-unit with coils terminals and connector to the outside in one compact housing



Antennas for immobilizer systems: the optimum component solution both functionally and economically for anti-theft applications



ALTERNATIVE POWER SYSTEMS



CABLE ASSEMBLY SYSTEMS



HIGH SPEED DATA NETWORKING



POWER DISTRIBUTION SYSTEMS



RELAYS & SWITCHING MODULES



SENSOR TECHNOLOGY



WIRELESS TECHNOLOGIES

OTHER TYCO ELECTRONICS AUTOMOTIVE TECHNOLOGIES



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The Tyco Electronics website is an innovative and interactive source for application information, product updates and technical solutions.

Our step-by-step software makes our website intuitive and user-friendly to better serve you!

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Product Information Center (PIC)

You can rely on Tyco Electronics PIC Team to provide you support for answers to your general information or technical questions in an efficient and effective manner.

To reach our PIC staff, please contact your local Tyco Electronics organization.



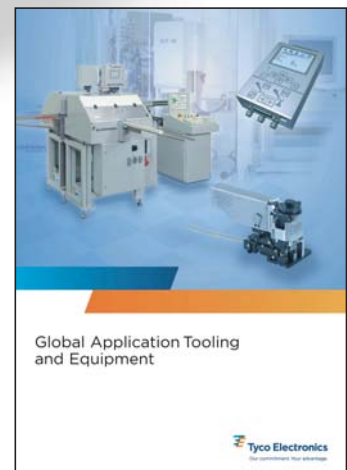
Product and Machine Literature

Tyco Electronics offers a variety of product specific catalogs, brochures and high impact flyers to help better serve you!

For more information on literature for Tyco Electronics'

Global Automotive Division, please contact your local Tyco Electronics

Organization or go to www.tycoelectronics.com/automotive



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