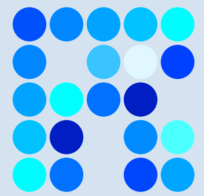
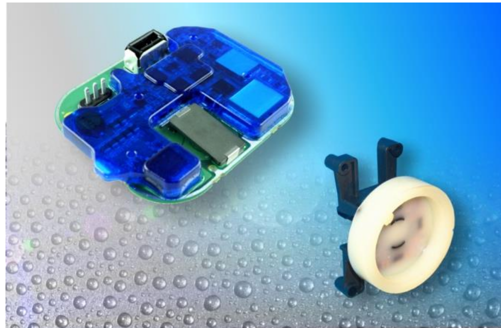
Assembly potting

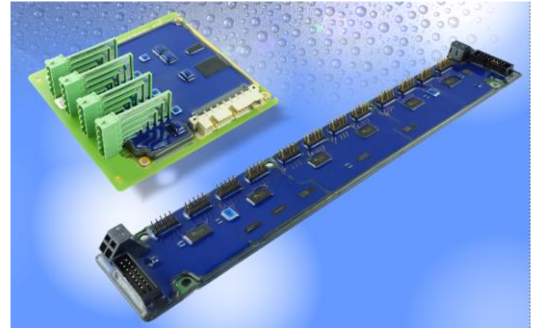
Process development - Consulting



Potting

for economic and optimal encapsulation of flat modules





Our services

- ✓ Project preliminary studies
- ✓ Designconsulting
- ✓ Process development
- ✓ Material selection
- ✓ Material preparation/-mixture

- → Potting frame and housing
- → Potting frame of prototyping 3D printing
- → Surface preparation
- → Economic review
- → Series potting

For perfect electrical insulation and the greates possible climate protection, adhesive plastic encapsulation is the best and often the only way. In addition, this type of insulation allows the user completely new design options. For example, higher operating voltages are possible on a module. Especially in the field of electromobility, this technology can provide many solutions.

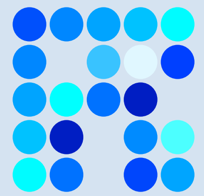
The economic basis for this is an optimal design as a result of a partnership between process development, design / construction and manufacturing technology. Essential for the functioning of a coating process, are the knowledge of later purpose of use, as well as the consideration of many possible influencing factors.

Careful preparation of a coating process is the essential requirement of an economical coating solution. This is where EPSYS comes into play and examines possible solutions, from the selection of possible pretreatment processes, through the selection of suitable coating materials and application processes, to the optimization of the manufacturing process.

EPSYS
electronic protective systems

Assembly potting

PCB-Packaging



Potting

Potting techniques

Full housing and frame potting

With the right choice of encapsulation material, the classic full-encapsulated housing is a suitable process to completely encapsulate the assembly in the plastic. Especially for an automated process, this procedure is particularly economical.
On the other hand, the frame encapsulation offers the possibility of one-sided and selective shedding of the assembly. The frame and the assembly itself form a housing. As a result, certain areas or components on the module can be cast specifically.
Both of the methods offer the electronics designer a wide variety of design options, taking into account the module design. Depending on requirements, potting can also be carried out under vacuum in order to completely eliminate air pockets.

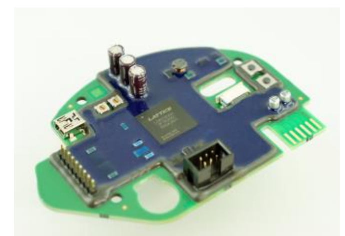
Advantage: Economical for high volume
Disadvantage: Tool costs for injection molding tools

The „Dam&Fill“ procedure

This method is particularly suitable for small to medium quantities, as high tooling costs can be saved for the production of the potting frame.

In the Dam&Fill process, a dam is first applied, so that together with the assembly forms a tight housing, which is filled with the potting material. It is important to choose suitable combinations of materials in order to achieve the highest possible protection and cost-effectiveness.

Als „dam“ materials thixotropic 1K casting compounds are used with very low flowability. The „fill“ material must behave accordingly reversed, this must be low-viscosity and flowable to securely enclose all components completely.



Advantage:	Economical for high mix Low investment for initialization Selective casting
Disadvantage:	High unit cost Different materials for Dam/Fill necessary

Coating facilities
Dosing systems
2K-Dosing sytem
Jet vents
Drying station
UV-Öven
Inspection systems
Coating sets
Complete equipment
Service & Consulting

EPSYS
electronic protective systems

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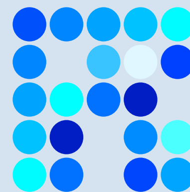

Potting

Potting techniques

3D-Mold potting

This special caseless potting technique has been perfected by EPSYS. The method may be particularly advantageous for small series, since expensive injection molding tools for plastic housing are not required.
The necessary potting cavities are made of flexible materials with non-stick effect. Thanks to the molding process developed by EPSYS, it is possible to engrave functional structures on the casting top side right up to type inscriptions.

A one-sided selective mold casting according to the Select-Cast-process offers the user unimagined possibilities in the adaption of the potting geometry or in the design of a device.

The devices required for 3D casting are manufactured in-house. A powerful metalworking center and 3D plotter for prototyping are available.

Common materials:

EPSYS has extensive know-how and experience in dealing with the processing and networking of numerous materials.
Here is a short overview:

Epoxides
- High heat resistance, usually used up to 150 °C
- Very hard and abrasion resistant
- Thermal expansion coefficient fits well with the epxide of the circuit board
- Good dielectric properties

Polyurethane
- Good dielectric properties
- Good moisture resistance
- Economically

Hydrocarbon resins
- Silicone free
- Soft elastic
- TG at -80 °C
- No exothermic heat during crosslinking

Silicones
- Can be used in a wide temperature (-60°C to over 200°C)
- Shock and impact absorption
- Good dielectric strength
- Good wetting due to low surface tension

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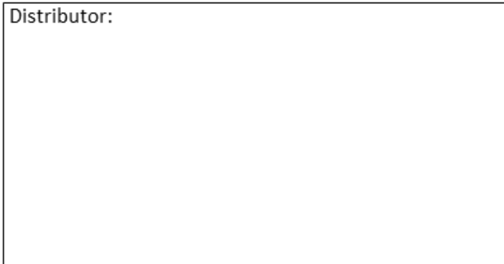
EPSYS is a producer of manufacturing equipment and accessories for the process protective coating, drying and control. EPSYS offers the complete set-up and integration of the required components for assembly protection.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