

# Why does direct bonding of resin and metal by special surface treatment do not spread ?

Problems of the method (insert molding) used for direct bonding of resin and metal by special surface treatment



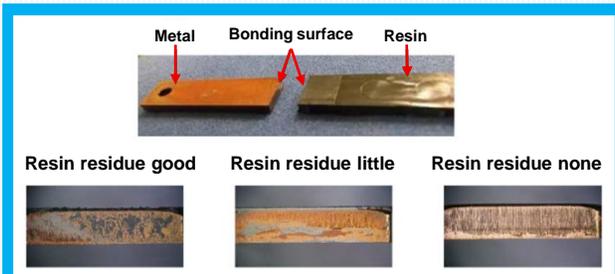
**Problem 1**  
Skin layer inhibits adhesion !

**Problem 2**  
Chemical reaction is incomplete !

**Problem 3**  
Mold temperature is too high !

**Problem 4**  
Construction method is left to user !

## Conventional insert molding



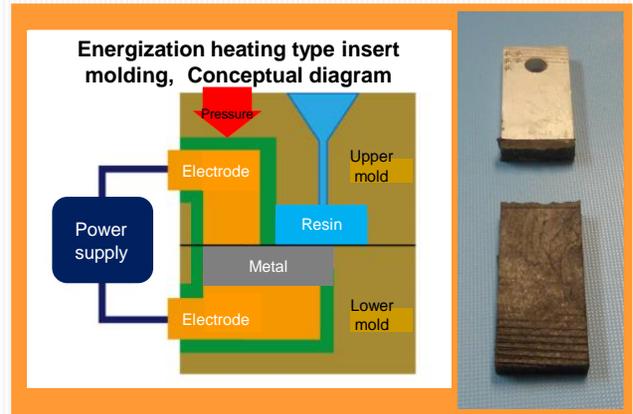
### What is skin layer ?

A thin layer formed by cooling and solidifying the surface of the resin at the moment of contact with the air and the surface of the mold when the molten resin is injected into the mold.

### Proble

- **The skin layer inhibits adhesion !**  
When the resin melted in the metal mold reaches the metal surface to be joined, since the skin layer partially inhibits the adhesion with metal, such problems as the metal does not stick to the whole surface and the fixing part is not uniform, etc.
- **Chemical reaction is incomplete !**  
Due to the variations in the temperature distribution of the metal surface, part of incomplete chemical reaction is generated, which causes problems such as nonuniform fixation, insufficient adhesion strength and airtightness performance, etc.
- **Mold temperature is too high !**  
In order to ensure the fluidity and chemical reaction of the resin, it is necessary to increase the mold temperature to 160°C or more. (Life time of mold becomes short)
- **Construction method is left to user !**  
Due to Construction method relying on insert molding which originally had many problems and the above problems, various unpredictable patterns of irregularities occur when mass production is started. Users who adopt the special surface treatment will be noticed later that the real cause of quality assurance is in the construction method.

## ELEBON



### Features

- **Completely destroys the skin layer !**  
By separating only the metal and controlling the temperature with a pinpoint at around 200 ° C, the skin layer is completely destroyed instantaneously at the timing when the resin touches the metal. By this action, the resin firmly adheres to the entire bonding surface of the method.
- **Take full advantage of chemical reactions !**  
By energizing the metal, we succeeded in developing an accurate and innovative heating means that can realize an efficient and uniform temperature distribution on the metal surface. By maximizing the effect of chemical reaction at the optimum temperature, different bonding strength and airtight performance can be obtained.
- **Recommended molding conditions by resin manufacturer are acceptable !**  
Molding conditions such as injection conditions and mold temperature are acceptable under the recommended conditions by the resin manufacturer.
- **This method is the only way to realize quality assurance !**  
With the above features, we support quality assurance of direct bonding of resin and metal by special surface treatment.