

Solderless Press-Fit and IDC Technology for Magnetic Wire Terminations in Electric Motors and Power Products

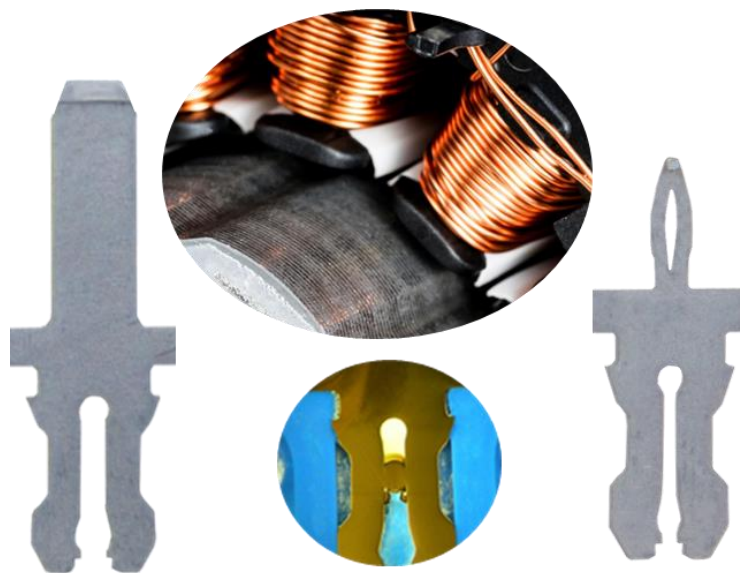
Compliant/Press-Fit interconnects are widely used in industrial, transportation, power module designs and many other applications to provide a solderfree, production-friendly and highly reliable alternative that overcomes the hassles and production problems with traditional solder-joints.

Insulation Displacement Component (IDC) technology provides an efficient method for creating direct, robust, solderfree interfaces to a wide range of magnet wire diameters and coatings, such as used in electric motors, generators and transformers.

Both of these technologies also offer a high degree of configuration flexibility and the ability to easily create custom-stamped designs to accommodate a wide range of application-specific requirements. These designs have been optimized for high-current carrying capabilities that are important in electric motor, generator, industrial and power applications.

Combining Press-Fit and IDC technologies is an excellent solution for streamlining assembly of these electric motors and power modules to their required control circuitry and bus bar grounding systems, while improving overall lifecycle reliability by eliminating failure modes associated with solder joints.

This Tech Bulletin provides a brief overview of the opportunities for combining Press-Fit and IDC technologies for use in motors, generators, transformers and power applications.

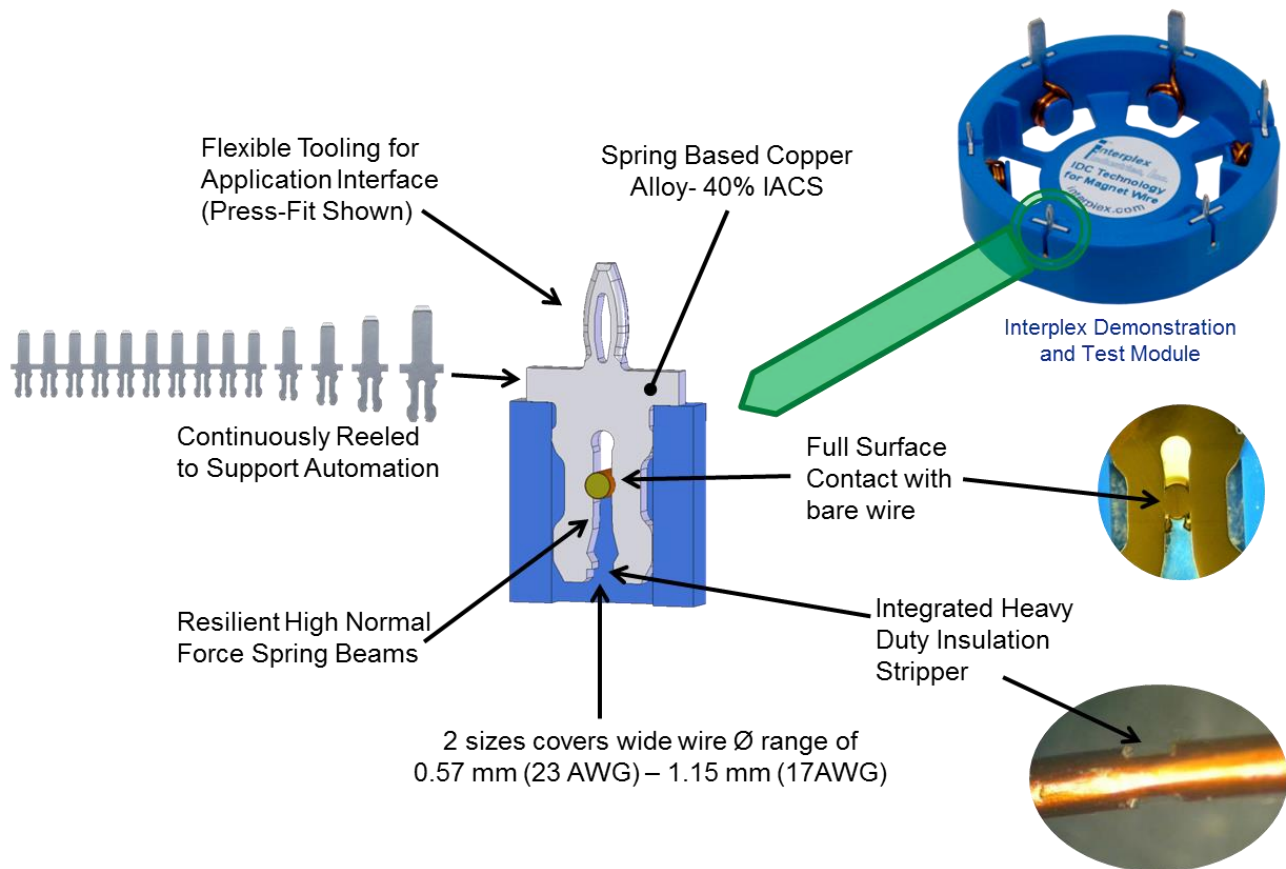


IDC Technology Overview

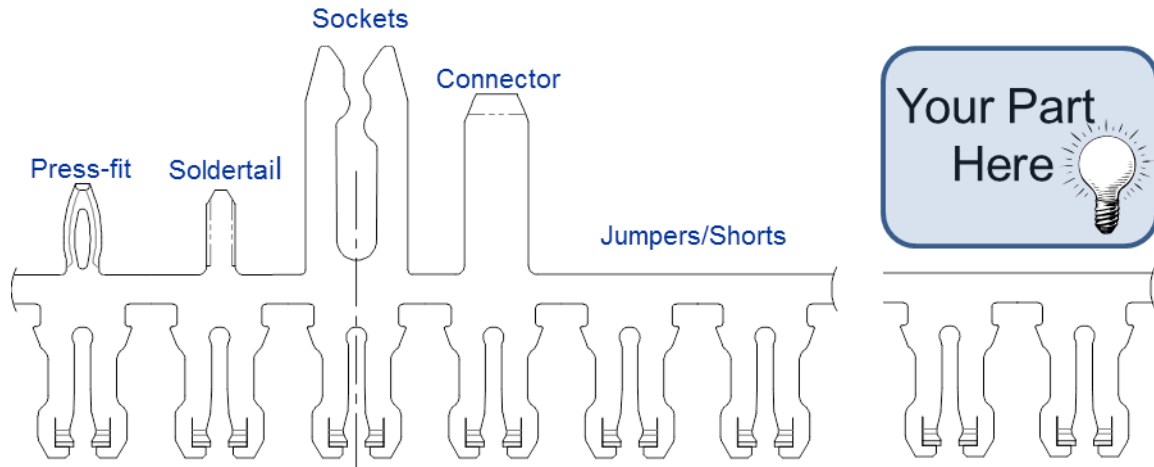
As the name describes, Insulation Displacement Components use an integrated insulation stripper that is designed to remove the heavy coated varnish used in magnet wire and to provide full surface contact with the bare stripped wire.

During assembly, the heavy duty insulation stripper is the first part of the IDC that comes into contact with the magnet wire, stripping away the insulation and exposing the copper wire beneath it. This enables the contact beam of the IDC to create a high normal force and low resistance electrical connection to the wire itself. IDCs consistently deliver contact resistance of less than $2\text{m}\Omega$ at 20mV .

The resilient high normal force applied by the IDC assures a consistently reliable connection that can withstand a wide range of temperature, vibration and other environmental factors over the course of a product's lifecycle. IDC interconnects made from highly conductive, spring-based alloys are rated up to 150°C to support high-power applications such as motors, transformers, generators, pumps and most magnet wire based assemblies.



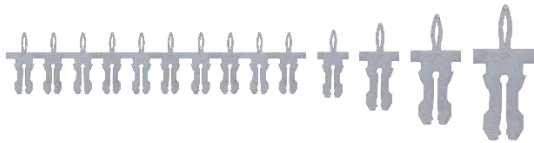
IDC terminals are available to accommodate a wide range of magnet wire diameters, from 0.50mm (23AWG) up to 1.20mm (17AWG). With flexible tooling, the stamped IDC interconnects can also be integrated with a variety of configurations, such as connectors, solder tails, sockets, jumpers/shorts, and press-fit compliant interconnects; in either continuous reeled or individual piece formats.



Combining IDC with Press-Fit

Integrating both IDC and Compliant/Press-Fit interfaces within the same stamped configuration has already proven to be an excellent way to create completely solder-free and high-reliability products. Because both of these interconnect approaches are designed for a high degree of adaptability and configurability, it is a natural course to combine them with each other.

Compatibility between the alloys and platings used for both IDC and Press-Fit provide a foundation for combining the technologies, with high normal force and high-current capacities being common factors in both arenas.



In many instances, a winding sub-assembly using magnet wire, such as a transformer, subsequently needs to be mounted to a control PCB or busbar assembly. With integrated IDC-and-Press-fit interconnects, the completed sub-assembly has external compliant interfaces and is ready for solder-free assembly, thereby streamlining the production steps at both levels.

Taking an applications-focused approach to combining IDC and Press-Fit, along with any special configuration or module-housing requirements, are key factors for success. Design validation, FEA evaluation, tooling design, quick-turn prototypes and globally controlled manufacturing are all critical factors that enable product designers to get the most from combining these interconnect technologies.

More information regarding Press-Fit and IDC technologies and products can be found on the web by visiting www.interplex.com/idc-terminals-and-connectors or by calling (718) 961-6212.