

## SHARK Technology

Shark technology is dedicated to connect winding enameled wires in motors and oil transformers, copper and aluminum wires, round and rectangular wires. We provide technical advice by recommending Shark connections and other configurations according to arrangements with customer.

### Quality of connection.

Connections made with Shark connectors conform with the requirements of PN-EN 61238 -1 standard, and have been awarded a certificate issued by Electrotechnical Institute from Warsaw.

### Durable connection

Connections made with Shark connectors have been in use in transformers for over 10 years. During the wire stripping process, usually there is a narrowing of the wire, which results in reduction of cross section and mechanical weakening of the wire. Use of Shark technology eliminates this problem, leading to a longer trouble-free operation of devices, in which Shark connectors and terminals are installed.

### Clean technology

Thank to use of Shark technology, process of removing enamel insulation from the wires has been eliminated. When connecting wires there is no need to secure the transformer against generated impurities. Ecological and environmental aspect is extremely important. Use of Shark connectors and terminals eliminates hazardous waste. The connection process of wire with insulation or enamel requires mechanical or chemical methods. Mechanical stripping method is scratching of insulation, causing dust and pollution. Another method is burning off or hard soldering with silver additive, causing environmental pollution with toxic elements. This methods also requires special operator's skills. The chemical method is dissolution of insulation in corrosive substances. Both methods are subject to a number of technological and environmental disadvantages. Shark Technology eliminates above problems. As a result, there is no dusty work environment, no toxic elements polluting the environment. There are no impurities, which are dangerous during operation of transformer. Risk of a short circuit is reduced, during further work of the transformer, what results in increased trouble-free operation of the entire electric network.

### Environment friendly technology

Shark connector fast and reliably replaces harmful to the environment soldering and enamel insulation burning processes.

### Easy operation

Dedicated and efficient tools and ERKO team help in preparing technology, enable trouble free implementation of Shark technology at customer's plant.

### Increased efficiency

All our customers who implemented Shark technology gained a significant increase in performance comparing to previously used technology.

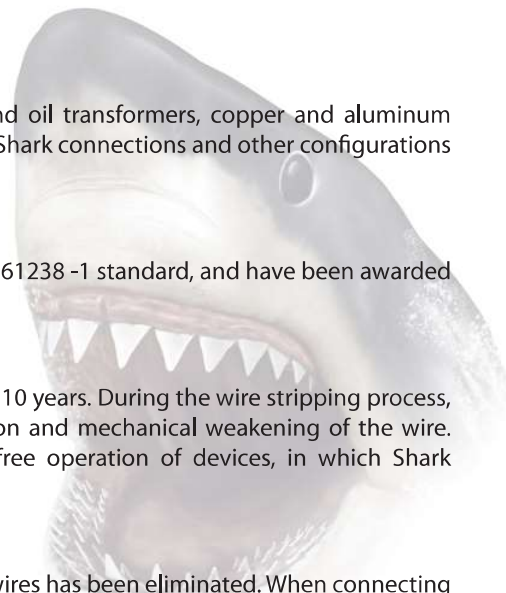
### Economical technology

Elimination of preparatory processes, energy consuming soldering process, reduction of stored connectors range, high efficiency of the process makes Shark technology more beneficial than traditional methods. The traditional methods of connecting wires requires from operators use of precision, complicated technology and dedicated tools for each cross-section. Shark connection ensures repeatability and efficiency. Furthermore ERKO offers dedicated and efficient tools for the smooth implementation of Shark technology.

### Universal technology

With one Shark connector one can make connection using wires of different cross-section, shape and material. Having over a dozen of connectors, any wire within scope of Shark connectors can be connected . We are able to recommend alternative connection solution for presently used by customer. Connected wires can be enameled, made of copper or aluminum. Shark connectors can be used to connect round and rectangular wires, and are applicable (with appropriate rules) to connect solid wires, as well as multiwires without insulation. In connection made with Shark technology, teeth of the connector bite through the enamel and into the core of connected wires. Therefore made connection is electrically and mechanically reliable.

*Possibility of adapting connectors for customer's needs.*



## Research and testing

On request, we carry out testing to evaluate the performance of Shark connections and tools used for the connections. The tests are based on the PN-EN 61238-1: 2004 standard.

During the tests, the following assumptions are made:

- the connection can not introduce additional resistance to the circuit
- during cyclic heating process of the connectors, its temperature must not exceed the temperature of the conductor on which they are installed.

In order to carry out the tests, we perform so called test chain. It is made by a series connection, using tested Shark connectors, of identical length of the conductor. The length of conductors connecting each connector is strictly defined in the PN-EN 61238-1: 2004 standard.

