

### FA 3

#### Safe Power Cables: Compounds and Markings

Countless technical systems only work if there is electric power. For the majority of applications power transmission involves cables and wires which are made under certain international standards. Cables consist of several wires – the actual power conductors – which are insulated on the outside by a plastic coat. The purpose of insulation is to protect a cable from electrical accidents, though also from short circuits resulting from contact between wires. Quite often cables contain further components, also made from wire, which serve as reinforcement or which are designed to prevent electromagnetic interference. On the outside, a cable is protected against mechanical, chemical and other influences by a plastic or rubber coat. The operation of a cable depends on the properties of its metallic and non-metallic components as well as on interaction between them. However, it also depends on durable and meaningful cable markings.

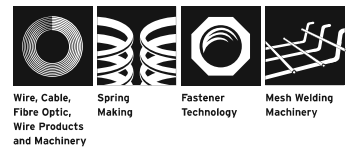
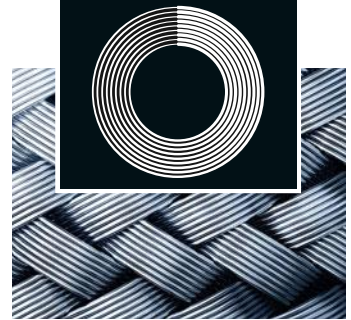
Some typical plastic materials (polymers) which are used in the production of cables are polyvinyl chloride (PVC), polyurethane (PU) and polyethylene (PE). However, all of these are processed in compound form, not pure. The compounds are given targeted admixtures which provide the raw polymer with certain physical properties, such as the colour, flame retardant qualities and resistance to UV light, high temperatures, corrosive media or mechanical impact.

The ever-increasing demands on cables necessarily also affect the compounds and the preparation, manufacturing and processing that are involved. Moreover, rules and regulations must be observed, such as the European chemicals regulation REACH and the EU Construction Products Regulation.

To ensure the proper laying of cables, they must be identifiable at all times. This is why, during the production process, markings are printed on the insulation material at regular intervals, specifying details of the manufacturer, structure, the materials and the intended application. The markings are usually made in a stamping process, using a tiny engraved

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steel wheel, and the lettering is produced by a laser or inkjet printer. When choosing the procedure, numerous criteria must be considered and weighed against each other, such as the intended visual impact, the properties of the relevant insulation material and interaction between the plastic surface and the marking medium.

### **The wire 2016 Trade Fair**

Manufacturers are making increasing use of the properties of cable materials and their tolerances. It is important for the manufacturing process that a machine should be convenient to set, that its downtimes are minimal, that the relevant formulas are observed without deviations, that the reject rate is as low as possible, but also that process data is recorded and integrated into higher-ranking control systems. Up-to-date information on these and other developments can be obtained at the international industry trade fair wire in Düsseldorf from 4 to 8 April 2016.

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