

# Definitions: Classes of Stress (Duty) in Flexible Cables and Insulated Wires

The application of a flexible cable in certain areas as, or in, operating materials as well as for certain combinations of external influences that can occur in these areas, is described by the collective term “stress” or “duty”. Suitable flexible cables and insulated wires are defined in the applicable equipment standards for the devices in question. On the basis of mechanical influences, as well the general expressions used, the term “stress” or “duty” is divided into the following categories.

## **Normal stress / Ordinary duty**

- Normal stress is present when the cables are subject to low mechanical stresses in the areas of application, and the risk of mechanical damage is low, as is the case to be expected in the normal use of small to medium size equipment in domestic and commercial as well as in light industrial premises. Such equipment includes amongst others, vacuum cleaners, toasters, washing machines, refrigerators.

## **Low stress / Light duty**

- Low stress is then present when the risk of mechanical damage and mechanical stress is low in the areas of application, as is the case to be expected for normal use of lightweight hand-held devices and lightweight operating materials in domestic households. Included in such equipment are radios, floor lamps, hairdryers, small desktop office equipment.

## **Very low stress / Extra light duty**

- Very low stress is then present when the risk of mechanical damage and mechanical stress is very low and can be considered negligible, i.e. under those influences that are to be expected for lightweight appliances in households and offices; Cases of applications where the cables having a greater mechanical protection would restrict the freedom of movement by the appliance. Included in such types of appliances are electric clocks and electric shavers.

## **High stress / Heavy duty**

- High stress is then present when the risk of mechanical damage or a mechanical stress is of medium severity appreciable, e.g. for normal use of equipment in moderately heavy branches of industry or agricultural workshops, and the temporary use of such at building sites. Included in such equipment are, amongst others, moderately heavy portable machinery and motors at a building site or in agricultural workings, large hot-water boiling installations, hand-held lamps, hoists, and fixed installations in temporary buildings.

## **High stress (Heavy duty) in multi-core cables**

- Applications as for high stress, though primarily for use in areas of manufacturing facilities including tool-making machinery, or mechanical handling equipment. The cables can be used inside or outside buildings for an ambient temperatures ranging from between  $-25^{\circ}\text{C}$  and  $+50^{\circ}\text{C}$  and the stabilised conductor temperatures do not exceed  $+60^{\circ}\text{C}$ . Examples are for connecting a control unit to a production machine, connections between a control unit and a machine, e.g. in hoists or cranes where the cable length does not normally exceed 10 m. Longer cable lengths are permissible for fixed inter-connections.

## **Application: Indoor and outdoor use**

The terms are in conjunction with the limiting conditions, such as for example, minimum and maximum operating temperatures, or the influence of the ambient temperatures, understood as being limited by the design and intended usage. This context is defined by “the intended environment”.

### **Indoor use**

- The cables are installed or connected to an apparatus device and can be used permanently in the building at all times, namely in “the intended environment”. The building can be used for commercial, industrial or residential purposes.

### **Outdoor use for a limited period**

- The cables may be used outdoors as “the intended environment” for short periods of time, e.g. connected to electric lawnmowers or drills.

### **Permanent outdoor use**

- The cables are designed to resist the various stresses that can occur outdoors in “the intended environment” (including weather conditions).