

Heat-resistance classes as per VDE 0530 part 1

class	Insulating material	Impregnation material	max. continuous temperature	Cable type
Y	Cotton, Synthetic and natural silk, Polyamide fibres, Paper, Polyvinylchloride (PVC), Polyethylene (PE), Vulkanised rubber	–	90°C	HELUKABEL® PVC and Neoprene cables
A	Cotton, Synthetic and natural silk, Polyamide, Paper, heat-resistant impregnated textiles, Polyester resin	Bitumous varnish Synthetic resin varnish Insulating oil and synthetic dielectrical fluids	105°C	HELUTHERM® single cores, control cables UL + CSA-approved
(E)	Special wire enamel, Special synthetic foils, Compressed material with cellulose fillers, Paper and cotton tapes	Synthetic resin varnish and Polyester resin, both with a permissible continuous withstand temperature of > 120°C	105°C (short time operation 120°C)	HELUTHERM® 120
B	Glass fibre, Micaproducts, Special synthetic foils, Compressed materials with mineral fillers	As under E but with a permissible continuous withstand temperature of > 130°C	145°C	HELUTHERM® 145
F	Glass fibre, Micaproducts, Aromatic polyamides, Impregnated glass fibre braides	Resins with a permissible continuous withstand temperature of > 155°C	155°C	HELUTHERM® 145
H	Glass fibre, Micaproducts, Aromatic polyamides, Silicone rubber, Polyamide foils, PTFE	Silicone resins with a permissible continuous withstand temperature of > 180°C	180°C	Silicone + HELUFLON® tinned conductors
C	Mica, Porcelain, Glass, Quartz, and similar fire resistant materials	As under H but with a permissible continuous withstand temperature of > 225°C	> 180°C	HELUFLON® PTFE+FEP with tinned or nickel plated conductors, HELUTHERM® 400/600/800/1200

Caloric load values (heat of combustion)

For designing a building the criterions of the caloric load values are very important. The caloric load values of the modern halogen-free cables are reduced by corresponding additives.

The specific heating values of the non-metallic raw materials for cables are specified to DIN 51900.

The values of the caloric load or heat of combustion for electrical cables are given per running meter in the following tables.

The tables are subdivided according to the different cable designs, with halogen-free or halogenated insulation, number of cores with different cross-sections.

With these tables of the caloric load values of our cables we will give you the possibility to accomodate your calculations for the application of these cables.

Regulations:

According to DIN VDE 108 supplement 1:

- The total caloric load of the cables are allowed up to 14 kWh per m² of the field areas if only

halogen-free cables with improved characteristics in the case of fire are used. If you use PVC cables the total caloric load is only up to 7 kWh per m².

- Cables are according to
 - DIN VDE 0250 part 214 – halogen-free installation cable with improved fire behaviour.
 - DIN VDE 0266 – halogen-free cables with improved characteristics in the case of fire.
 - DIN VDE 0815 – wiring cables for telecommunication and data processing systems.
- The caloric load values – Hu (calculated value):

PVC-core insulation	Hu	6,3 kWh/kg
PVC-sheath material	Hu	5,7 kWh/kg
PVC (lower limit)	Hu	5,6 kWh/kg
H-core insulation	Hu	4,8 kWh/kg
H-sheath material	Hu	4,2 kWh/kg
PE in general	Hu	12,2 kWh/kg
PP in general	Hu	12,8 kWh/kg

The conversion of the values:

$$1 \text{ MJ/m}^2 \triangleq 0,278 \text{ kWh/m}^2, 1 \text{ kWh/m}^2 \triangleq 3,6 \text{ MJ/m}^2$$