## General information about electric chain hoists

Apart from the usual criterion such as lifting capacity, lifting speed and dimensions also consider following:

## 1. Choosing a motor according to FEM 9.683

In addition to the torque the decisive criterion for rating an electric motor is the heat it generates. Here we differentiate between two operational modes:

### 1.1 Intermittent duty

In this case the motor is designed for a series of equal cycles consisting of duty periods with constant load and rest periods. The heat generation depends on the relative duty cycle, that is, the relationsship between operating period under load, total operating time and the number of starts/hour.

$$ED = \frac{\text{Operating period}}{\text{Operating period + rest periods}} \%$$

The number of cycles that can be made under full load is calculated as follows:

$$S \approx 0.3 \times \frac{ED \times V}{H}$$

S = Cycles per hour
ED = Duty rating in %
V = Lifting speed in m/min.
H = Average lifting height in m

A cycle consists of a motion of lifting, lowering and the rest periods. One must ensure that the lifting height does not exceed the value permitted by the percentage duty cycle referred to a cycle period of 10 minutes

$$H \leq \frac{ED \times V}{20}$$

and that simultaneously the permissible number of starts is not exceeded. It is generally accepted that a cycle consists of 6 starts.

### 1.2 Short time duty

Where special duty conditions exist (e.g. long hook path) the operating period must be of such length that the admissible temperature limit of the motor is not exceeded. For such cases intermittent duty must be replaced by short time duty. That is, the motor may be operated for up to 10 starts over a certain period (with Yale products 30 min.). Thereafter the motor must cool down to room temperature.

### 1.3 Calculation example intermittant duty

| | | |
|---|---|---|
| Electric hoist | : | CPV 5-8 |
| Lifting speed | : | 8 m/min. |
| Lifting height | : | 2.8 m |
| Duty rating ED | : | 50 % |
| c/h | : | 180 |

**Number of cycles per hour.**

$$S = 0.3 \times \frac{50 \times 8}{} = 42.8$$

**Max. lifting height**

$$H = 2.8 \leq \frac{50 \times 8}{20} = 20 \text{ m}$$

**Number of starts**

$$N = \frac{25 \text{ cycles}}{\text{hour}} \times \frac{6 \text{ starts}}{\text{cycle}} = 150 \text{ c/h}$$