LIFETIME

LIFE CALCULATION

The dynamic load rating **C** is a conventional load rating used in life calculations. The life to which this load rating is related is 100 km.
The values of **C** are given for the different series of sliders on pages A12, A16, A20, A21 and A24. Life, load rating and equivalent external load are related to each other by the formula:

$$L_{km} = 100 \cdot \left(\frac{C}{P} \cdot \frac{f_c}{f_i} \cdot f_h \right)^3$$

where:
$\mathbf{L_{km}}$ is the theoretical life in km;

C is the dynamic load rating in Newton;

P is the equivalent external load in Newton;

$\mathbf{f_c}$ is the contact factor;

$\mathbf{f_i}$ is the service factor;

$\mathbf{f_h}$ is the stroke factor;

The equivalent external load **P** is the load whose effect is equivalent to the sum of the effects of the forces and moments acting simultaneously on the slider. Knowing the various load components acting on the slider (see page A40), the value of **P** can be calculated according to the expression:

$$P = P_r + \left(\frac{P_a}{C_{0ax}} + \frac{M_1}{M_x} + \frac{M_2}{M_y} + \frac{M_3}{M_z} \right) \cdot C_{0rad}$$

In the above expression the loads are considered as constant in time. Instantaneous forces not exceeding maximum capacities, do not influence the life and can therefore be disregarded.

The factor $\mathbf{f_c}$ refers to applications where more than one slider pass over the same point in the rail, i.e. when the sliders do not pass the same point no reduction factor shall be used. The $\mathbf{f_c}$ factor has the following values:

No. of sliders	1	2	3	4
f_c	1	0.8	0.7	0.63

The service factor $\mathbf{f_i}$ has a similar meaning to that of the safety factor **z** in the verification under static load, and is equal to:

f i	
neither shocks nor vibrations; smooth and low frequency reverse; clean working environment; low speed (<1 m/s)	**1 – 1.5**
light vibrations; medium speed (between 1 and 2.5 m/s) and medium reverse frequency	**1.5 – 2**
shocks and vibrations; high speed (>2.5 m/s) and high reverse frequency; very polluted working environment	**2 – 3.5**

The stroke factor $\mathbf{f_h}$ takes account of the fact that the raceways are stressed more frequently when the slider runs short strokes, with equal total run. The graph gives the values of $\mathbf{f_h}$ (with strokes longer than 1 m, $\mathbf{f_h}$ remains equal to 1):