VERIFICATION UNDER STATIC LOAD

The load capacities of the **SN** series linear ball bearings are based on slider lengths and are shown on the tables on the previous pages. The loads and moments should be centered on the slider (for uncentered loads and moments, please see the paragraph at the bottom of this page).
In the **SN** series the values of the loads and moments are independent from the slider position during the stroke.
By static verification, the radial load C_{0rad}, the axial load C_{0ax} and the moments M_x, M_y, M_z, give the maximum permissible value for the load, beyond which the rolling quality and the total mechanical strength may be compromised. Verification under static load has to be carried out by determining the necessary safety factor **z** which corresponds most closely to the actual loads and working conditions shown in the table below.

Neither shocks nor vibrations, smooth and low frequency reverse, high precision in assembly, no elastic yielding;	1 - 1.5
Normal assembly conditions;	1.5 - 2
Shocks and vibrations, significant elastic yield, high frequency reverse;	2 - 3.5

Verification must be made to ensure that the external load P or the external moment M are lower than or equal to the load capacities divided by the safety factor **z**:

$$\frac{P}{C_{0rad}} \leqslant \frac{1}{z} \quad \text{or} \quad \frac{P}{C_{0ax}} \leqslant \frac{1}{z} \quad \text{or} \quad \frac{M}{M_x\,(o\,M_y\,o\,M_z)} \leqslant \frac{1}{z} \qquad [1]$$

if P is only radial — if P is only axial — if only moments are present

where **P** is the external applied load, in newton and **M** is the external applied moment, in Nm. This is valid if the external load consists of a single force or a single moment. When forces and moments are present simultaneously, as frequently happens, verification must be made to ensure that the sum of each force or applied moment complies with the following formula:

$$\frac{P_{rad}}{C_{0rad}} + \frac{P_{ax}}{C_{0ax}} + \frac{M_1}{M_x} + \frac{M_2}{M_y} + \frac{M_3}{M_z} \leqslant \frac{1}{z} \qquad [2]$$

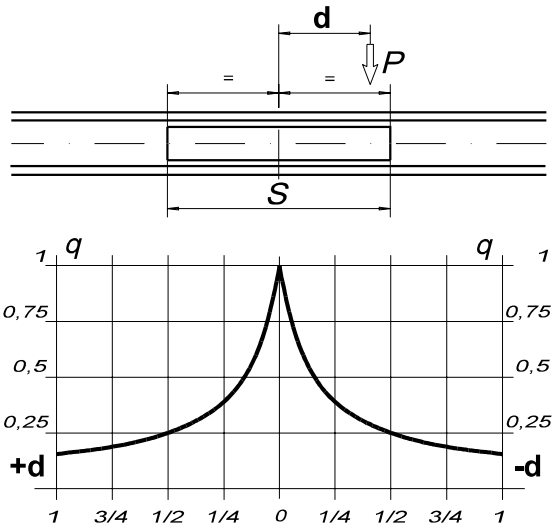
P_{rad}, P_{ax} are the radial and axial resultants of the applied external loads, in newton;

M_1, M_2, M_3 are the resultant external moments, in Nm.

External load P in a non-central position on the slider:

If the load is not centered on the slider, the distribution of the different stresses on the balls and the consequent reduction in the load capacity C must be considered. As shown in the diagram at right, this reduction is dependent upon the distance **d** between the center of the slider and the point of application of the external load (where **q** is the coefficient of position and the distance **d** is expressed in fractions of the slider length S).
The external load **P** which can be applied as a function of **d** is:

$P = q\,C_{0rad}$ if the external load P is radial
$P = q\,C_{0ax}$ if the external load P is axial



For the verification under static load and the lifetime calculation (see page D13) in the formulas (1), (2), (3), P_{rad} and P_{ax} must be replaced by the corresponding equivalent values calculated as follows:

$$P_{rad} = \frac{P}{q}$$ if the external load P is radial

$$P_{ax} = \frac{P}{q}$$ if the external load P is axial