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Rolling bearings — Static load ratings

AMENDMENT 1

Roulements — Charges statiques de base

AMENDEMENT 1

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This document was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 8, *Load ratings and life*.

Rolling bearings — Static load ratings

AMENDMENT 1

Clause 4

Insert the following symbols:

$E(\kappa)$ complete elliptic integral of the second kind

$K(\kappa)$ complete elliptic integral of the first kind

$\Sigma\rho_e$ curvature sum at the outer ring contact

$\Sigma\rho_i$ curvature sum at the inner ring contact

$F(\rho)$ curvature difference of a point contact

γ auxiliary parameter, $\gamma = D_\mathrm{w} \cos \alpha / D_\mathrm{pw}$

κ ratio of semi major to semi minor axis of the contact ellipse

5.1.1

Replace the subclause with the following:

5.1.1 Basic static radial load rating for single bearings

The basic static radial load rating for radial ball bearings is given by Formula (1):

$$C_{0\mathrm{r}} = f_0 \, i \, Z \, D_\mathrm{W}{}^2 \cos\alpha \tag{1}$$

where, except for radial self-aligning ball bearings

$$f_0 = \min\left\{f_{0,\mathrm{i}}, f_{0,\mathrm{e}}\right\}$$

in which

$$f_{0,\mathrm{i}} = 2{,}399\ 05 \cdot \kappa_\mathrm{i} \cdot \left[\frac{E\left(\kappa_\mathrm{i}\right)}{2 + \dfrac{\gamma}{1-\gamma} - \dfrac{D_\mathrm{w}}{2 \cdot r_\mathrm{i}}}\right]^2 \tag{2}$$

$$f_{0,\mathrm{e}} = 2{,}399\ 05 \cdot \kappa_\mathrm{e} \cdot \left[\frac{E\left(\kappa_\mathrm{e}\right)}{2 - \dfrac{\gamma}{1+\gamma} - \dfrac{D_\mathrm{w}}{2 \cdot r_\mathrm{e}}}\right]^2 \tag{3}$$

where

i is the inner ring;

e is the outer ring.

The calculation of the Hertzian parameters, κ and $E(\kappa)$, is described in Annex B.

For a radial self-aligning ball bearing, the factor, f_0, is given by Formula (4):

$$f_0 = 3,151\ 84 \cdot \left[\frac{\pi}{4} \cdot (1+\gamma)\right]^2 \quad (4)$$

The guide values given in Table 1 apply to bearings with a cross-sectional raceway groove radius not larger than $0,52D_\text{w}$ in radial and angular contact ball bearing inner rings, and $0,53D_\text{w}$ in radial and angular contact ball bearing outer rings and self-aligning ball bearing inner rings. The load-carrying ability of a bearing is not necessarily increased by the use of a smaller groove radius, but is reduced by the use of a groove radius larger than those indicated above. In the latter case, the value f_0 shall be calculated by the formulae given here.

Annex C gives a graphical representation of the value f_0 in dependency of the bearing internal geometry. The results of the formulae given here are preferred over Table 1 and Annex C.

5.2.1

Renumber Formula (2) and Formula (3) respectively into Formula (5) and Formula (6).

6.1

Replace the subclause with the following:

6.1 Basic static axial load rating

The basic static axial load rating for single-direction and double-direction thrust ball bearings is given by Formula (7):

$$C_{0\text{a}} = f_0\, Z\, D_\text{w}{}^2 \sin\alpha \quad (7)$$

where

$$f_0 = \min\left\{f_{0,\text{i}}, f_{0,\text{e}}\right\}$$

in which

$$f_{0,\text{i}} = 11,995\ 2 \cdot \kappa_\text{i} \cdot \left[\frac{E(\kappa_\text{i})}{2 + \dfrac{\gamma}{1-\gamma} - \dfrac{D_\text{w}}{2 \cdot r_\text{i}}}\right]^2 \quad (8)$$

$$f_{0,\text{e}} = 11,995\ 2 \cdot \kappa_\text{e} \cdot \left[\frac{E(\kappa_\text{e})}{2 - \dfrac{\gamma}{1+\gamma} - \dfrac{D_\text{w}}{2 \cdot r_\text{e}}}\right]^2 \quad (9)$$

