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**Plain bearings — Hydrostatic plain journal bearings without drainage grooves under steady-state conditions —**

Part 2:

**Characteristic values for the calculation of oil-lubricated plain journal bearings without drainage grooves**

*Paliers lisses — Paliers lisses radiaux hydrostatiques sans rainure d'écoulement fonctionnant en régime stationnaire —*

*Partie 2: Caractéristiques du calcul pour la lubrification des paliers lisses radiaux sans rainure d'écoulement*



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## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 12168 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12168-2 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 4, *Methods of calculation of plain bearings*.

ISO 12168 consists of the following parts, under the general title *Plain bearings — Hydrostatic plain journal bearings without drainage grooves under steady-state conditions*:

- *Part 1: Calculation of oil-lubricated plain journal bearings without drainage grooves*
- *Part 2: Characteristic values for the calculation of oil-lubricated plain journal bearings without drainage grooves*



# Plain bearings — Hydrostatic plain journal bearings without drainage grooves under steady-state conditions —

Part 2:

## Characteristic values for the calculation of oil-lubricated plain journal bearings without drainage grooves

### 1 Scope

This part of ISO 12168 lists, in graphic form, characteristic values used in the calculation of oil-lubricated plain bearings without drainage grooves.

### 2 Normative reference

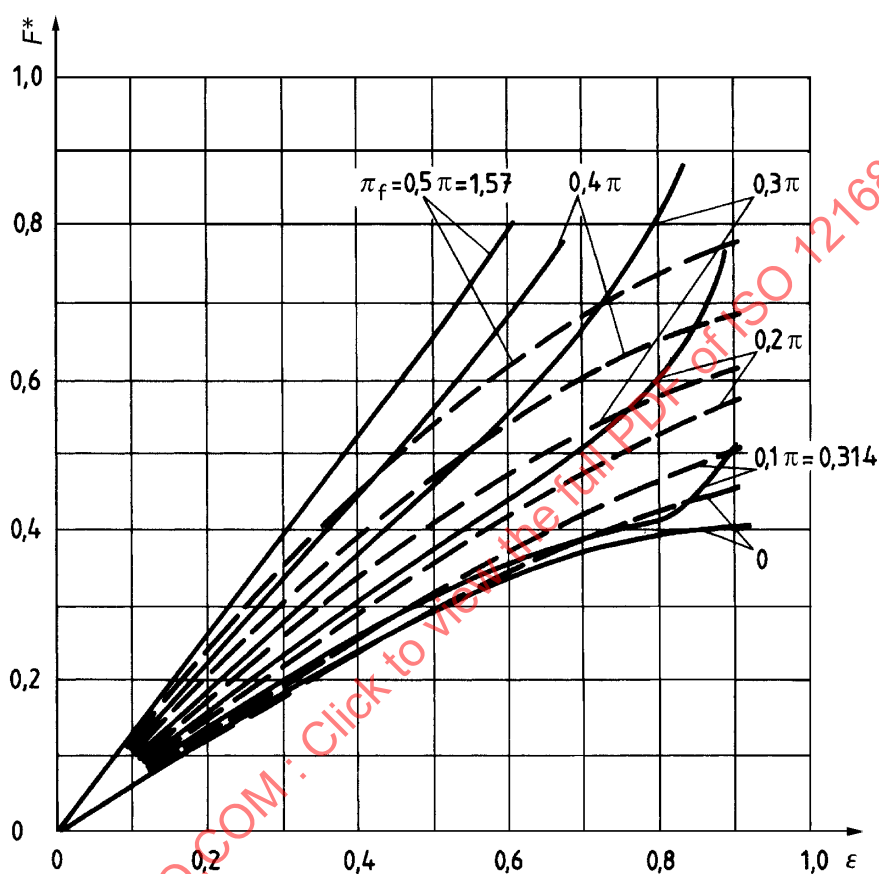
The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 12168. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 12168 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 12168-1, *Plain bearings — Hydrostatic plain journal bearings without drainage grooves under steady-state conditions — Part 1: Calculation of oil-lubricated plain journal bearings without drainage grooves*

### 3 Characteristic values

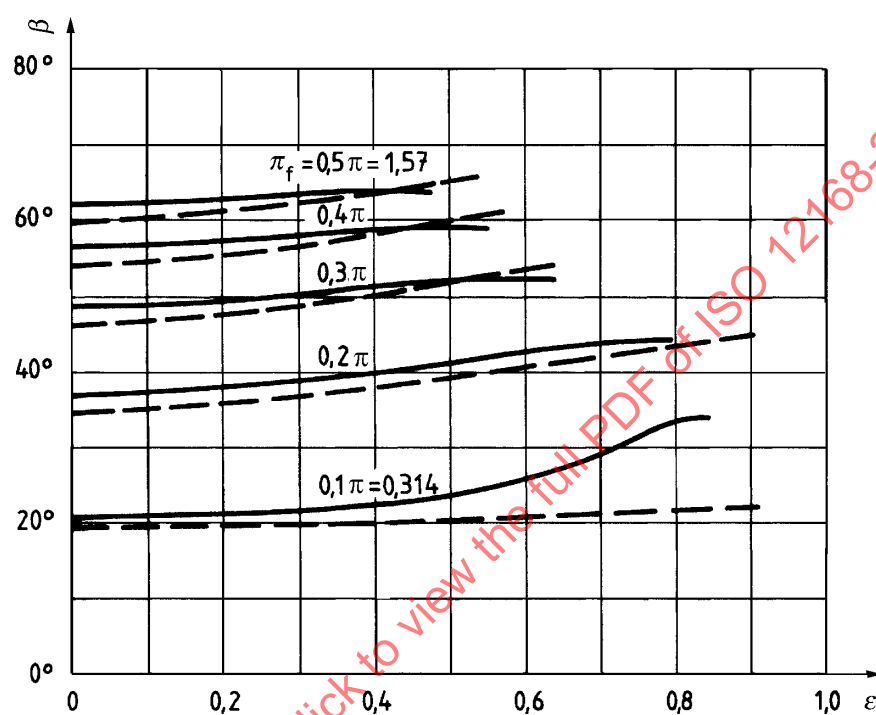
See Figures 1 to 19 and Table 1.

The characteristic values given in this part of ISO 12168 are necessary for the calculation of oil-lubricated hydrostatic plain journal bearings in accordance with ISO 12168-1. They are based on the premises and boundary conditions specified therein. The values required for the calculation can be determined from the diagrams. Explanations concerning the symbols and calculation examples are included in ISO 12168-1. When designing a plain bearing the characteristic values listed in Table 1 can be used for optimized bearings.



----- approximate solution; — more precise solution

Figure 1 — Characteristic values of load-carrying capacity  $F^*$  as a function of the relative eccentricity  $\varepsilon$  for different relative frictional pressures  $\pi_f$  and four recesses,  $B/D = 1$ ;  $l_{ax}/B = 0,16$ ;  $l_c/B = 0,26$ ;  $\xi = 1$ ;  $\alpha = 0$  [1]



----- approximate solution; — more precise solution

Figure 2 — Attitude angle  $\beta$  as a function of the relative eccentricity  $\varepsilon$  for different relative frictional pressures  $\pi_f$  and four recesses,  $l_{ax}/B = 0,16$ ;  $l_c/B = 0,26$ ;  $B/D = 1$ ;  $\xi = 1$ ;  $\alpha = 0$  [1]

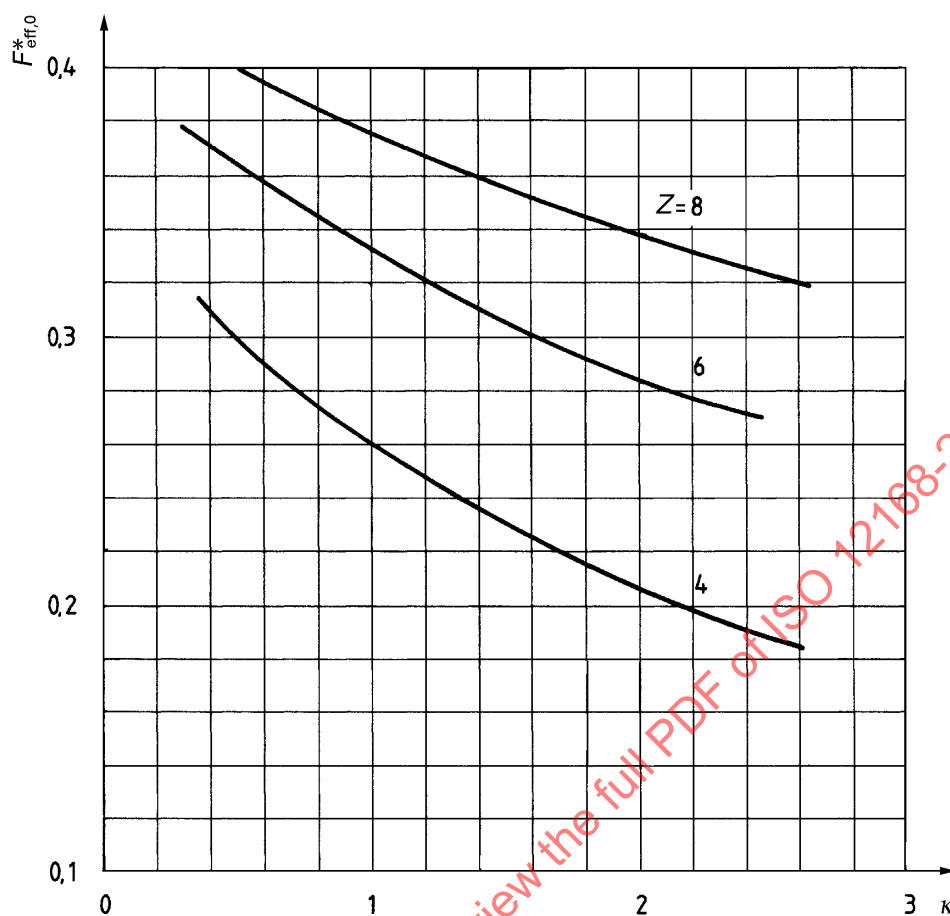


Figure 3 — Characteristic values of load-carrying capacity  $F_{\text{eff},0}^*$  for a relative eccentricity  $\varepsilon = 0,4$  as a function of the resistance ratio  $\kappa$  and for different numbers of recesses  $Z$ ,  $\alpha = 0$ ;  $\omega = 0$ ;  $\xi = 1$

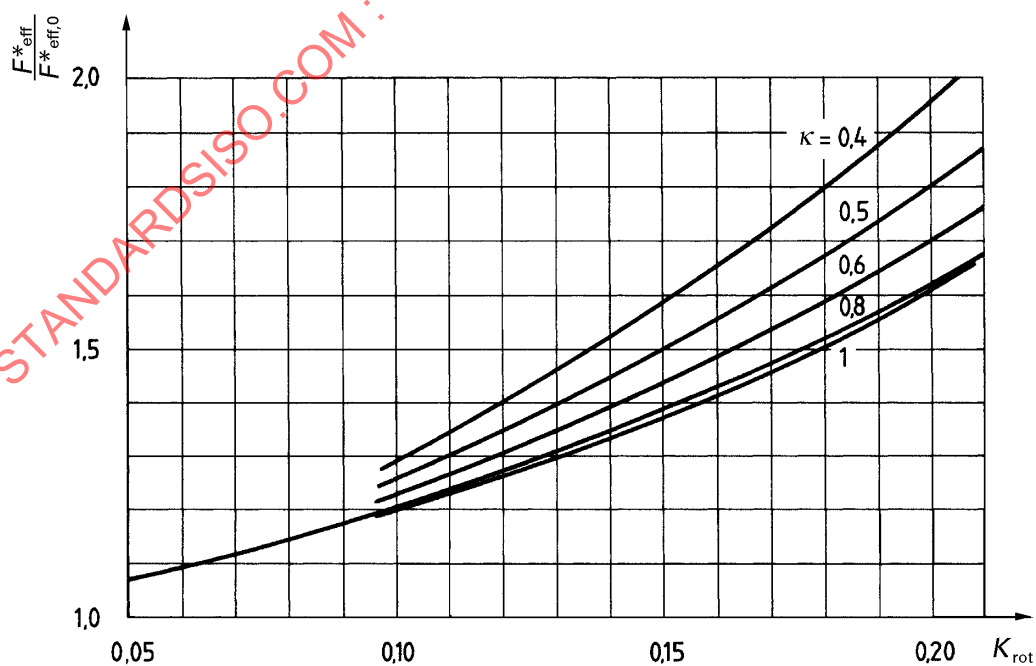


Figure 4 — Ratio of the characteristic values of load-carrying capacity  $F_{\text{eff}}^*/F_{\text{eff},0}^*$  as a function of the speed dependent parameter  $K_{\text{rot}}$  for different resistance ratios  $\kappa$  and four recesses,  $\varepsilon = 0,4$ ;  $\alpha = 0$ ;  $\xi = 1$



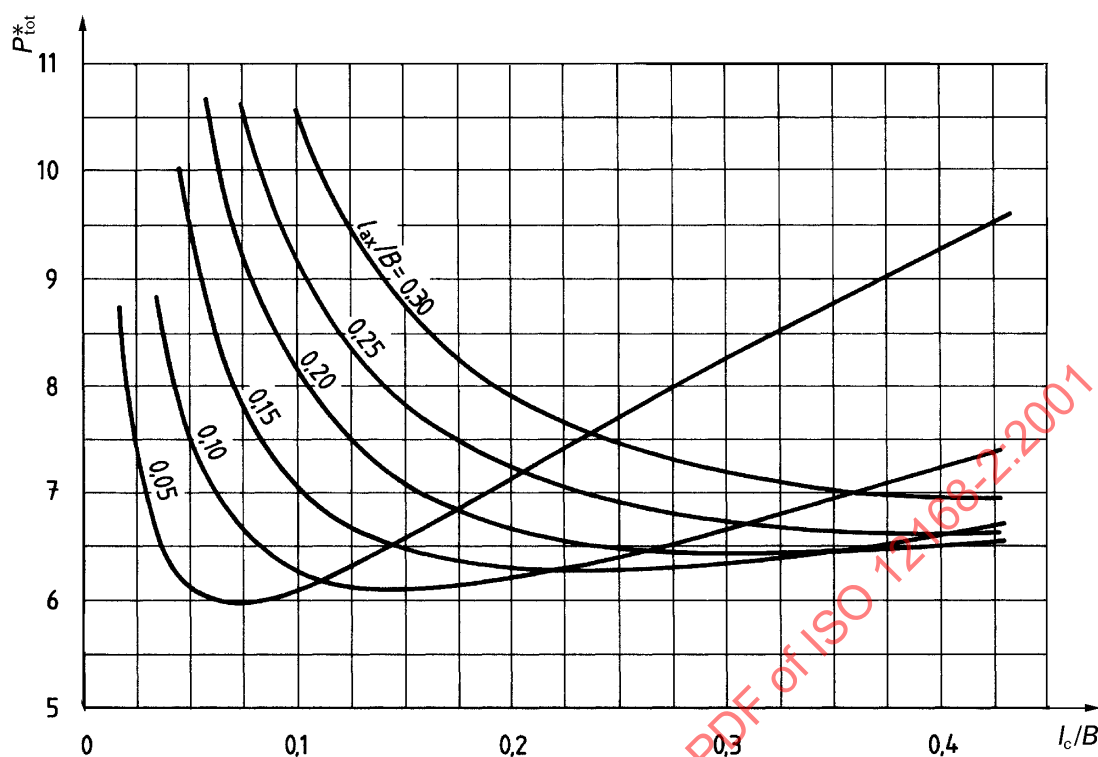


Figure 5 — Characteristic values of total power  $P_{\text{tot}}^*$  as a function of the relative land widths  $l_{\text{ax}}/B$  and  $l_c/B$ ,  $B/D = 1$ ;  $\varepsilon = 0,4$ ;  $Z = 4$ ;  $\xi = 1$ ;  $P^* = 2$ ;  $\alpha = 0$ ;  $h_p = 40 \times C_R$ , without friction in the recesses

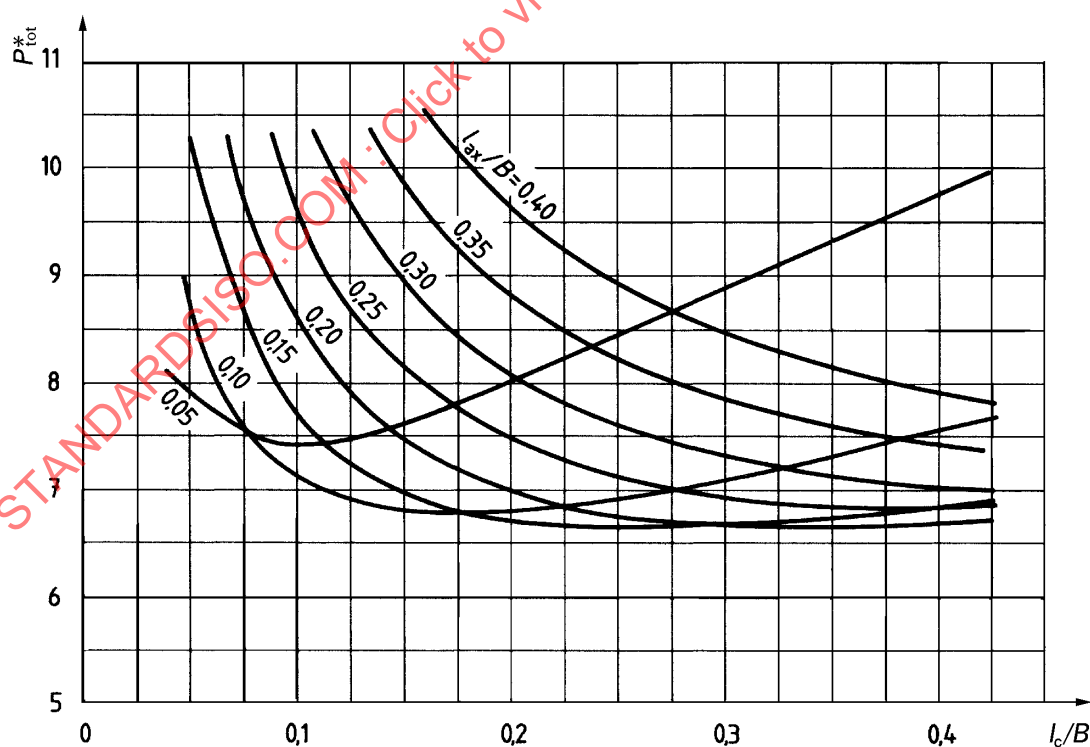


Figure 6 — Characteristic values of total power  $P_{\text{tot}}^*$  as a function of the relative land widths  $l_{\text{ax}}/B$  and  $l_c/B$ ,  $B/D = 1$ ;  $\varepsilon = 0,4$ ;  $Z = 4$ ;  $\xi = 1$ ;  $P^* = 2$ ;  $\alpha = 0$ ;  $h_p = 40 \times C_R$ , with friction in the recesses

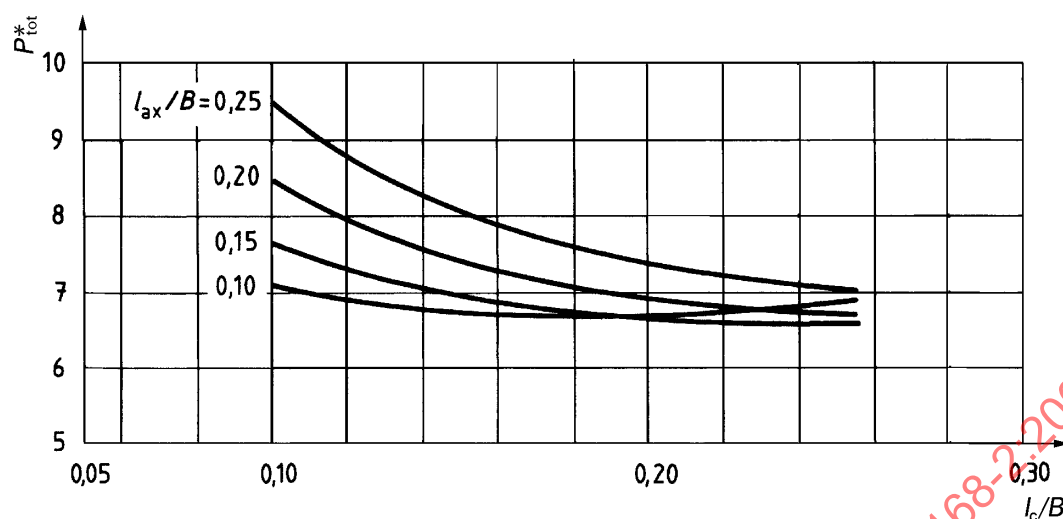


Figure 7 — Characteristic values of total power  $P_{tot}^*$  as a function of the relative land widths  $l_{ax}/B$  and  $l_c/B$ ,  $\varepsilon = 0,4$ ;  $B/D = 1$ ;  $P^* = 2$ ;  $Z = 4$ ;  $\xi = 1$ ;  $h_p = 40 \times C_R$ , with friction in the recesses

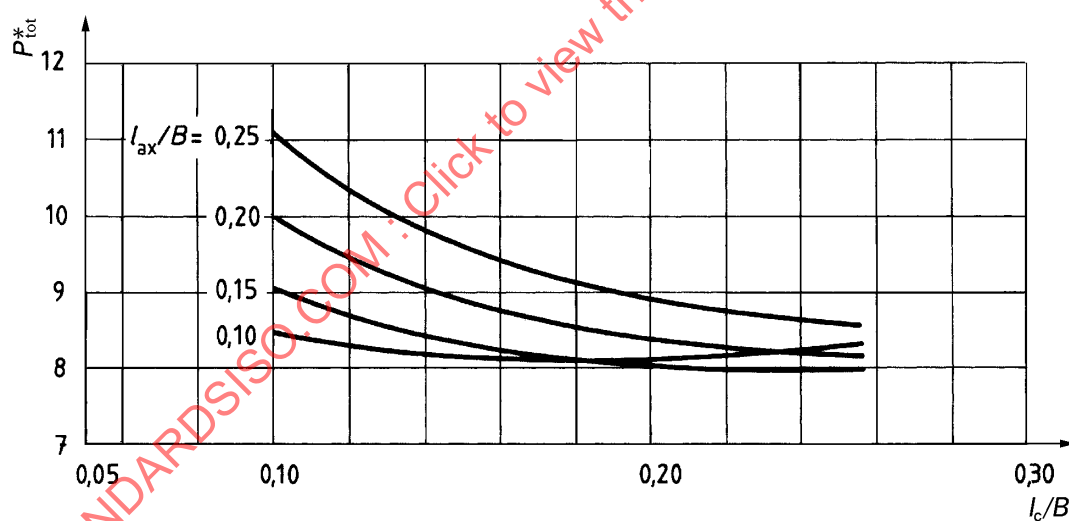


Figure 8 — Characteristic values of total power  $P_{tot}^*$  as a function of the relative land widths  $l_{ax}/B$  and  $l_c/B$ ,  $\varepsilon = 0,4$ ;  $B/D = 0,8$ ;  $P^* = 2$ ;  $Z = 4$ ;  $\xi = 1$ ;  $h_p = 40 \times C_R$ , with friction in the recesses

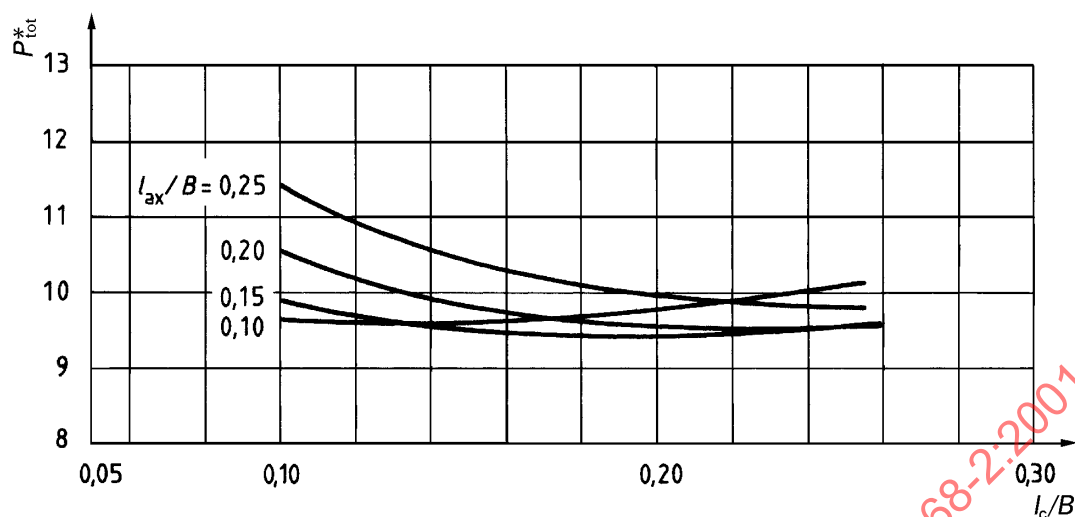


Figure 9 — Characteristic values of total power  $P_{\text{tot}}^*$  as a function of the relative land widths  $l_{\text{ax}}/B$  and  $l_c/B$ ,  $\varepsilon = 0,4$ ;  $B/D = 0,6$ ;  $P^* = 2$ ;  $Z = 6$ ;  $\xi = 1$ ;  $h_p = 40 \times C_R$ , with friction in the recesses

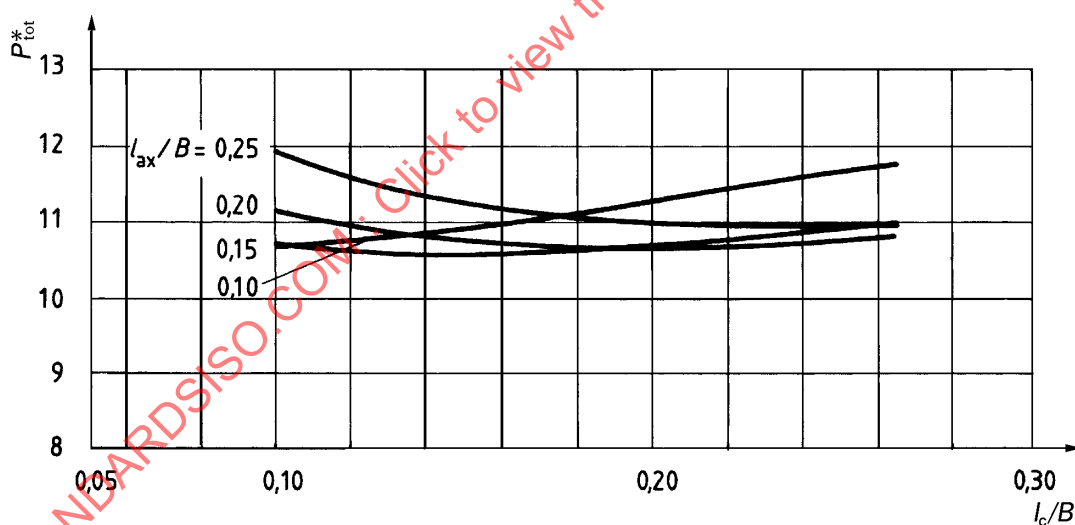


Figure 10 — Characteristic values of total power  $P_{\text{tot}}^*$  as a function of the relative land widths  $l_{\text{ax}}/B$  and  $l_c/B$ ,  $\varepsilon = 0,4$ ;  $B/D = 0,5$ ;  $P^* = 2$ ;  $Z = 8$ ;  $\xi = 1$ ;  $h_p = 40 \times C_R$ , with friction in the recesses

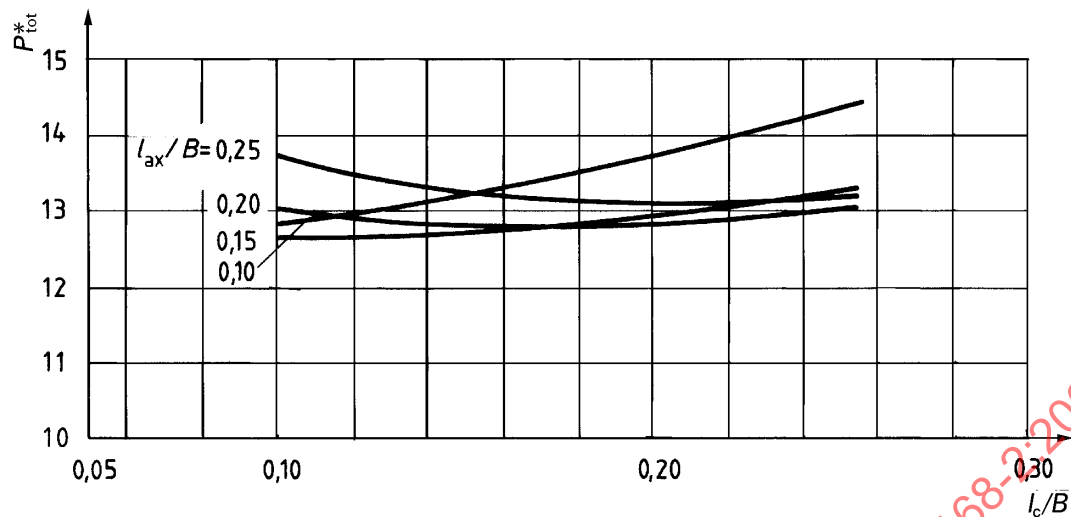


Figure 11 — Characteristic values of total power  $P_{tot}^*$  as a function of the relative land widths  $l_{ax}/B$  and  $l_c/B$ ,  $\varepsilon = 0,4$ ;  $B/D = 0,4$ ;  $P^* = 2$ ;  $Z = 10$ ;  $\xi = 1$ ;  $h_p = 40 \times C_R$ , with friction in the recesses

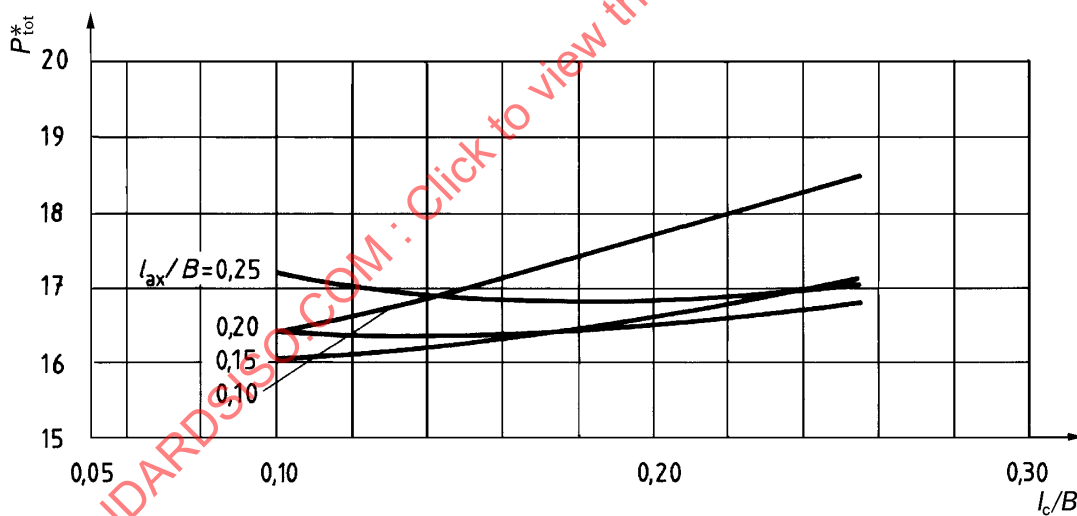


Figure 12 — Characteristic values of total power  $P_{tot}^*$  as a function of the relative land widths  $l_{ax}/B$  and  $l_c/B$ ,  $\varepsilon = 0,4$ ;  $B/D = 0,3$ ;  $P^* = 2$ ;  $Z = 12$ ;  $\xi = 1$ ;  $h_p = 40 \times C_R$ , with friction in the recesses

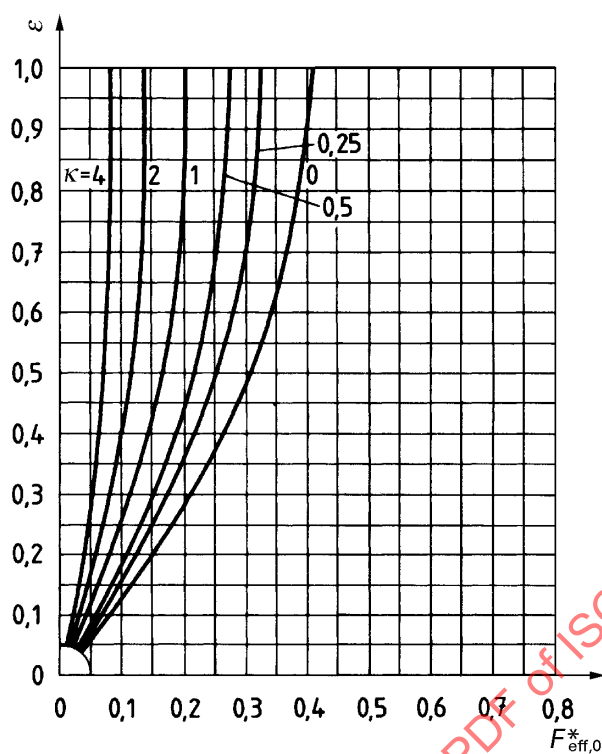


Figure 13 — Relative eccentricities  $\varepsilon$  as a function of the characteristic values of load-carrying capacity  $F_{\text{eff},0}^*$  for different resistance ratios  $\kappa$  and three recesses; load directed to centre of the land [2]

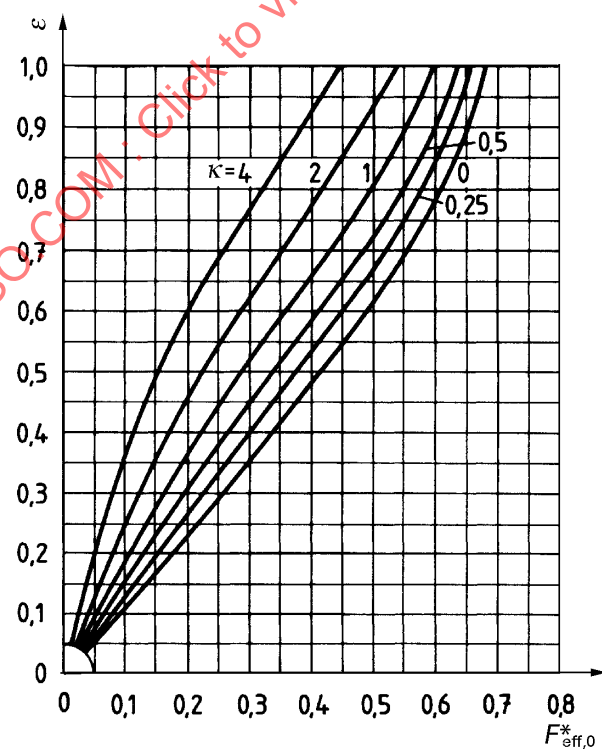


Figure 14 — Relative eccentricities  $\varepsilon$  as a function of the characteristic values of load-carrying capacity  $F_{\text{eff},0}^*$  for different resistance ratios  $\kappa$  and three recesses; load directed to centre of the recess [2]

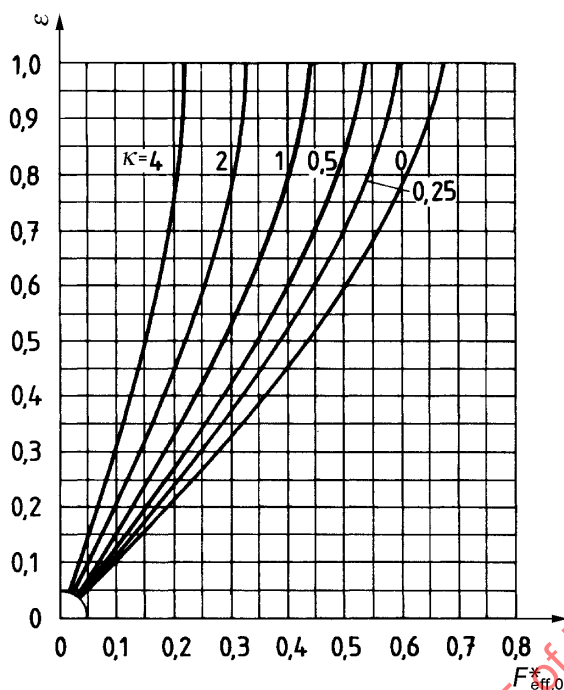


Figure 15 — Relative eccentricities  $\varepsilon$  as a function of the characteristic values of load-carrying capacity  $F_{\text{eff},0}^*$  for different resistance ratios  $\kappa$  and four recesses; load directed to centre of the land [2]

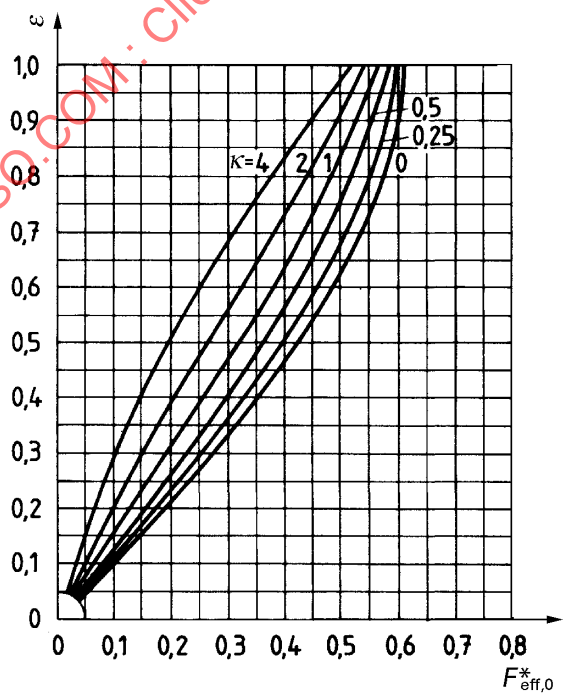


Figure 16 — Relative eccentricities  $\varepsilon$  as a function of the characteristic values of load-carrying capacity  $F_{\text{eff},0}^*$  for different resistance ratios  $\kappa$  and four recesses; load directed to centre of the recess [2]