INTERNATIONAL STANDARD

ISO 12168-2

Second edition
2019-11

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

Reference number
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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 8, *Calculation methods for plain bearings and their applications*.

This second edition cancels and replaces the first edition (ISO 12168-2:2001), of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

— adjustment to ISO/IEC Directives, Part 2:2018;

— correction of typographical errors.

A list of all parts in the ISO 12168 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

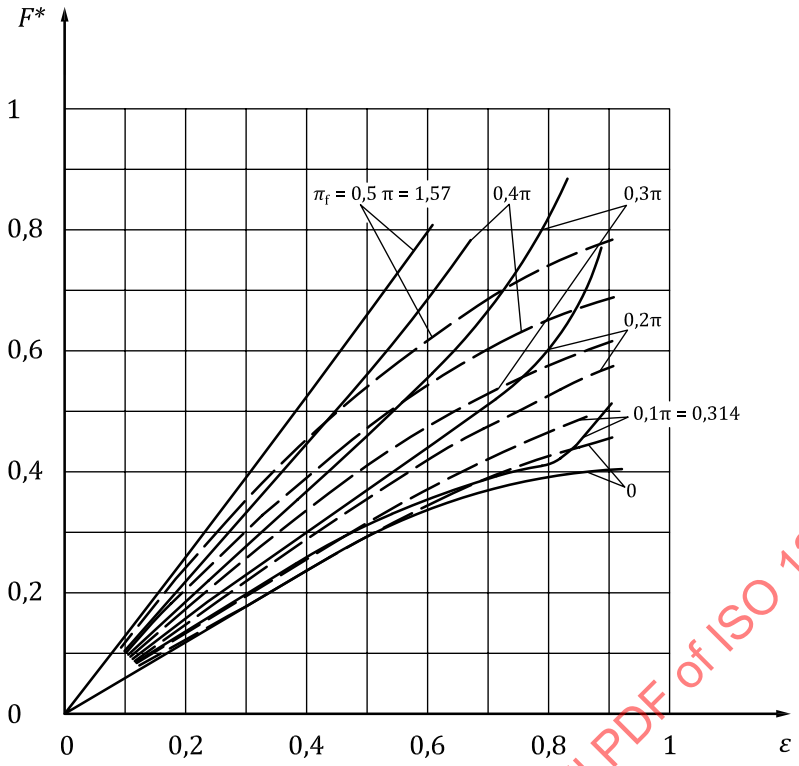
— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Characteristic values

The characteristic values are shown in Figures 1 to 19 and Table 1.

The characteristic values given in this document 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.

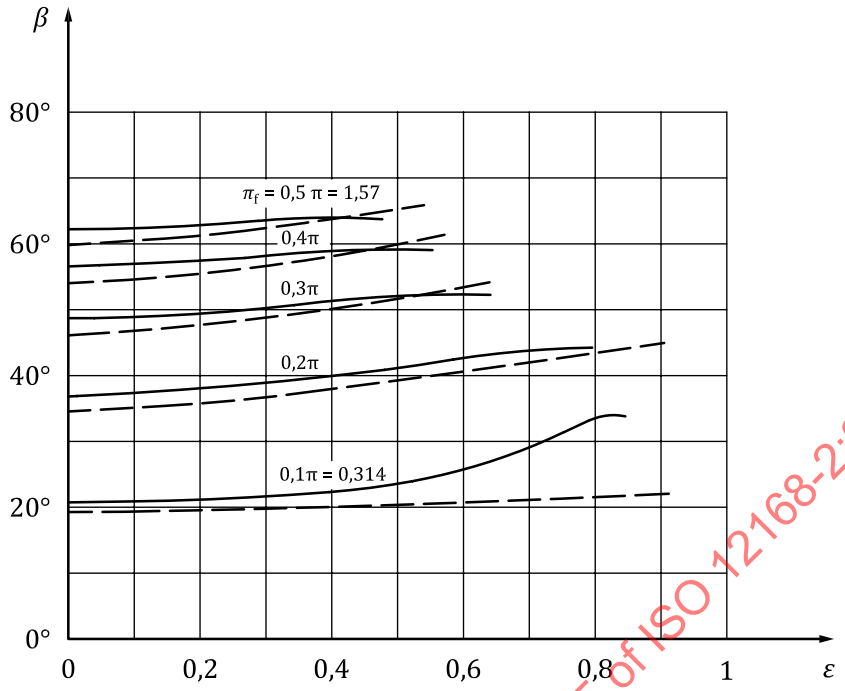


Key

_ _ _ _ approximate solution

_____ more precise solution

Figure 1 — Characteristic values of load-carrying capacity F^* as a function of the relative eccentricity ε for different relative frictional pressures π_f and $Z = 4$; $B/D = 1$; $l_{ax}/B = 0{,}15$; $l_c/B = 0{,}25$; $\xi = 1$; $\alpha = 0$[2]



Key

_ _ _ _ approximate solution

_____ more precise solution

Figure 2 — Attitude angle β as a function of the relative eccentricity ε for different relative frictional pressures π_f and Z = 4; l_{ax}/B = 0,15; l_c/B = 0,25; B/D = 1; ξ = 1; α = 0[2]

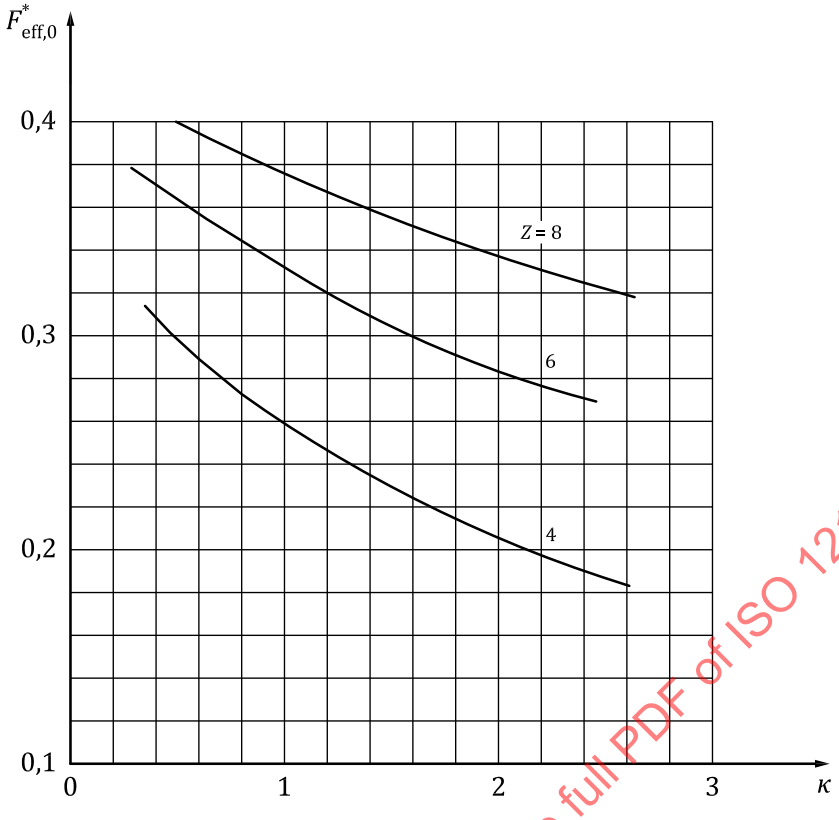


Figure 3 — Characteristic values of load-carrying capacity $F^*_{eff,0}$ for a relative eccentricity $\varepsilon = 0{,}4$ as a function of the resistance ratio κ and for different numbers of recesses Z, $\alpha = 0$; $\omega = 0$; $\xi = 1$

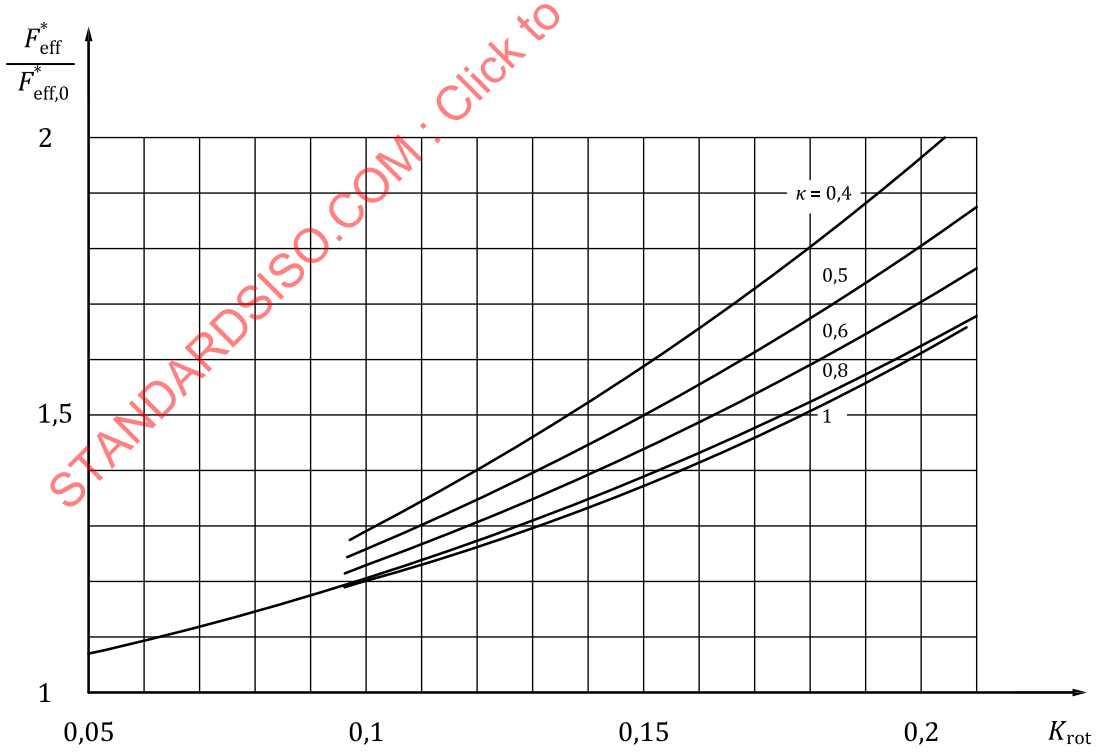


Figure 4 — Ratio of the characteristic values of load-carrying capacity $F^*_{eff} / F^*_{eff,0}$ as a function of the speed dependent parameter K_{rot} for different resistance ratios κ and $Z = 4$; $\varepsilon = 0{,}4$; $\alpha = 0$; $\xi = 1$

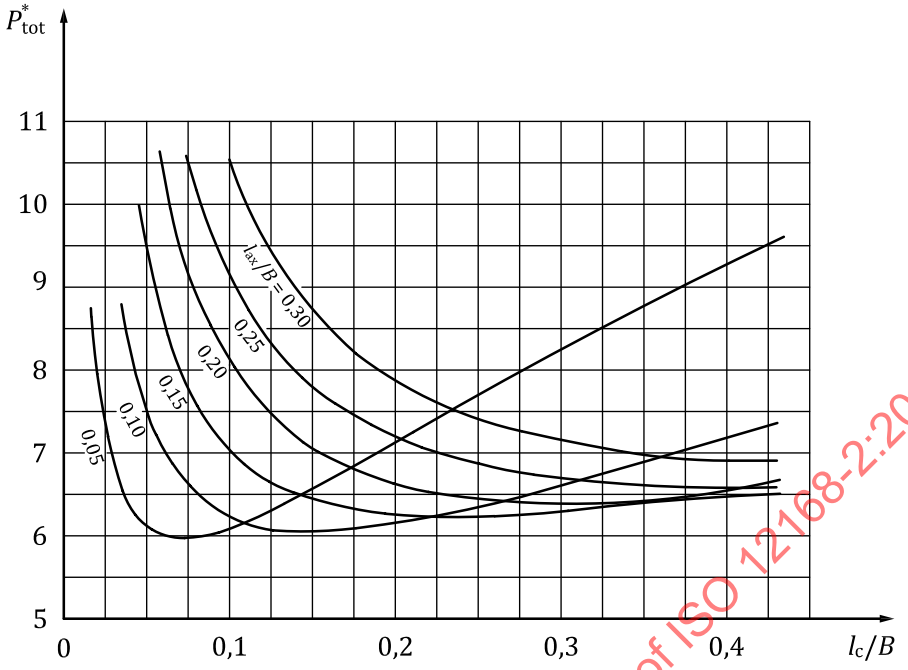


Figure 5 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B, B/D = 1; ε = 0,4; Z = 4; ξ = 1; P^* = 2; α = 0; h_p = 40 × C_R, without friction in the recesses

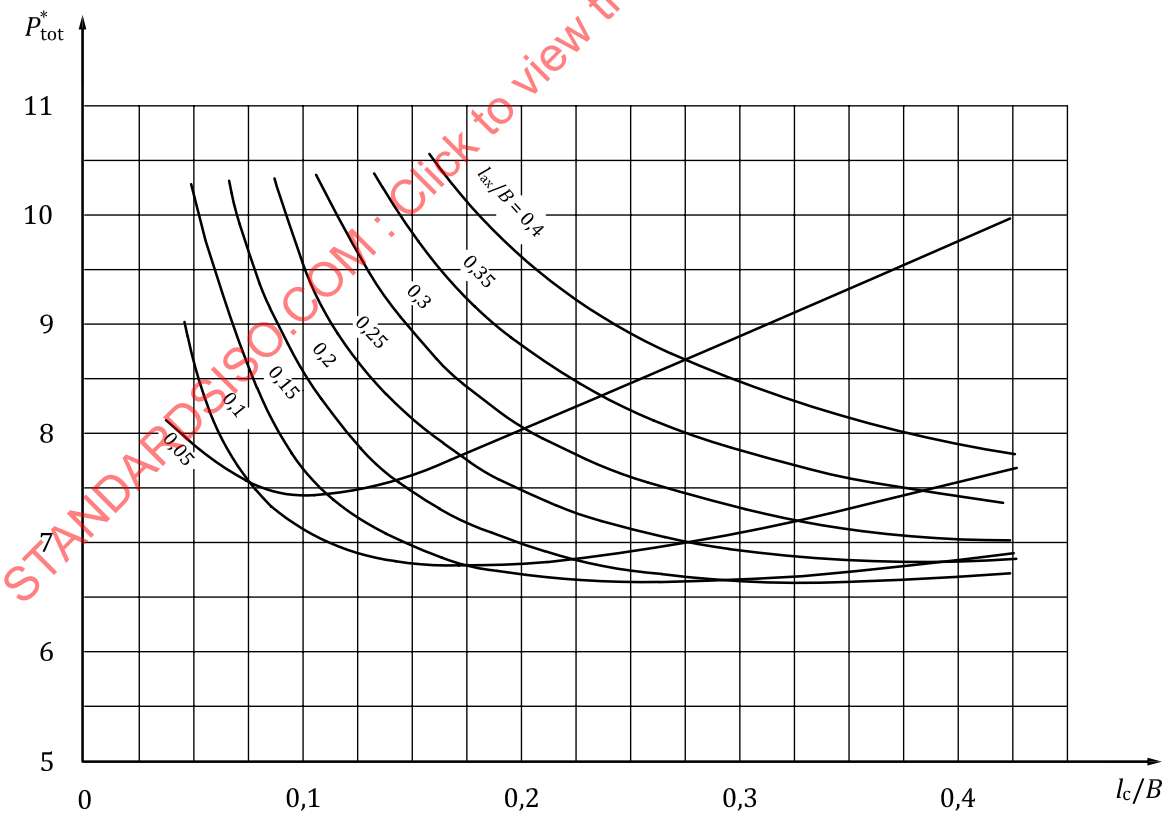


Figure 6 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B, B/D = 1; ε = 0,4; Z = 4; ξ = 1; P^* = 2; α = 0; h_p = 40 × C_R, with friction in the recesses

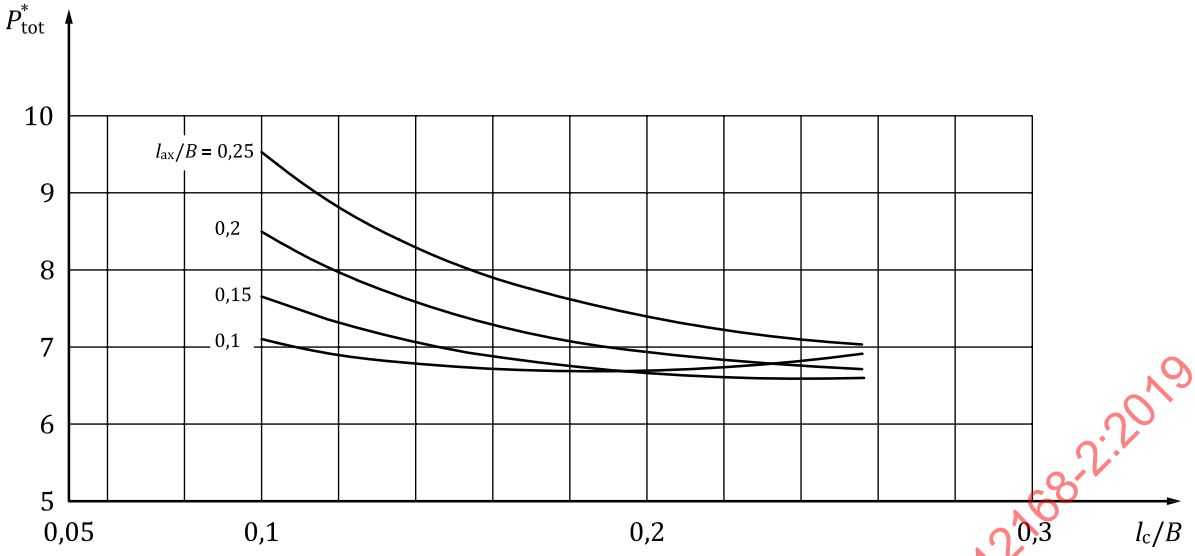


Figure 7 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B, ε = 0,4; B/D = 1; P^* = 2; Z = 4; ξ = 1; h_p = 40 × C_R, with friction in the recesses

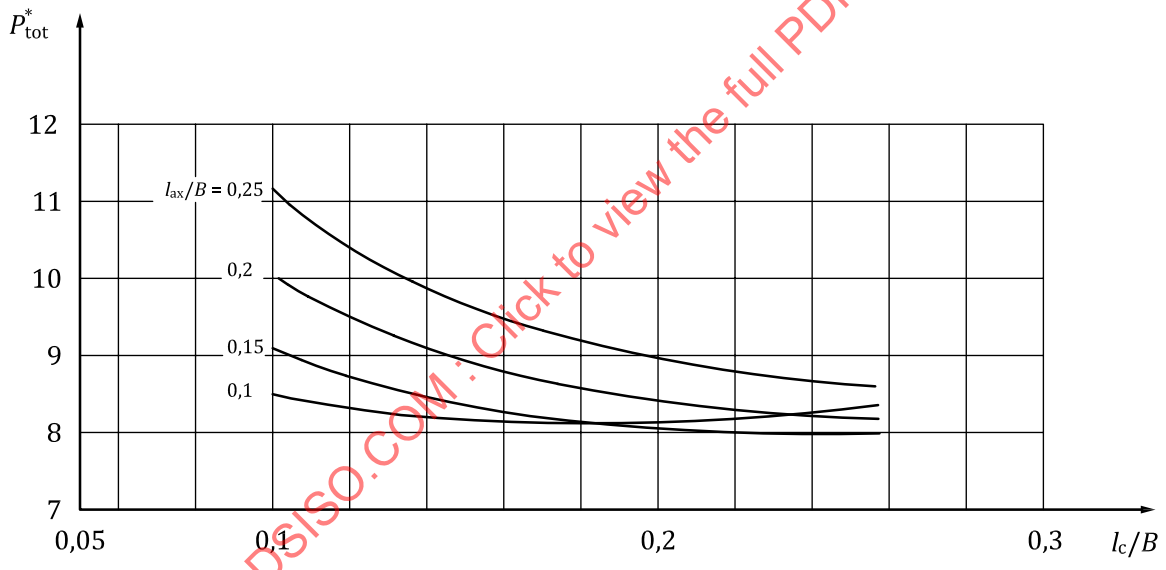


Figure 8 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B, ε = 0,4; B/D = 0,8; P^* = 2; Z = 4; ξ = 1; h_p = 40 × C_R, with friction in the recesses

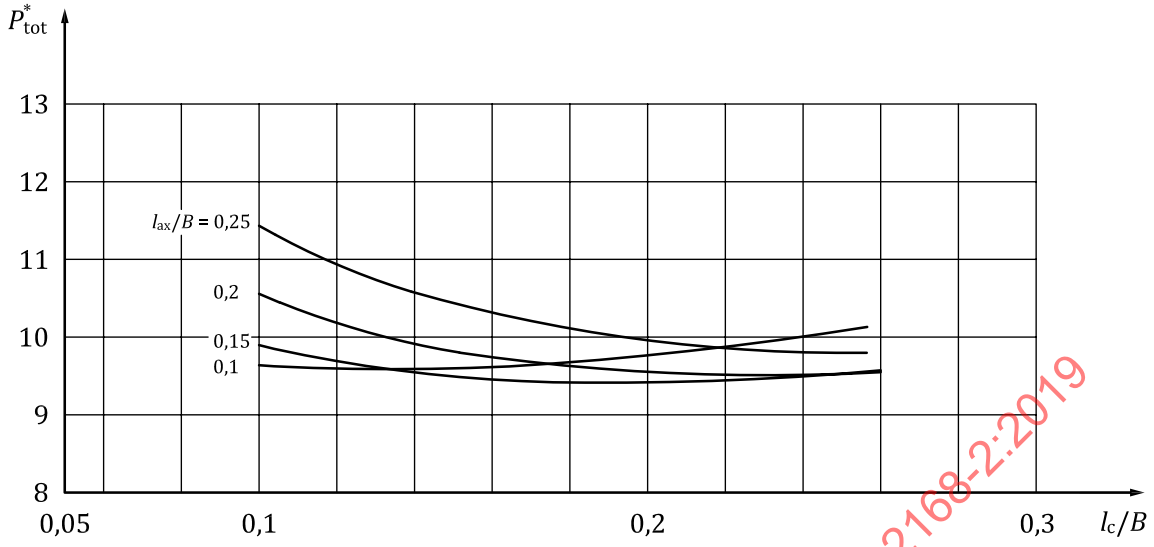


Figure 9 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B, ε = 0,4; B/D = 0,6; P^* = 2; Z = 6; ξ = 1; h_p = 40 × C_R, with friction in the recesses

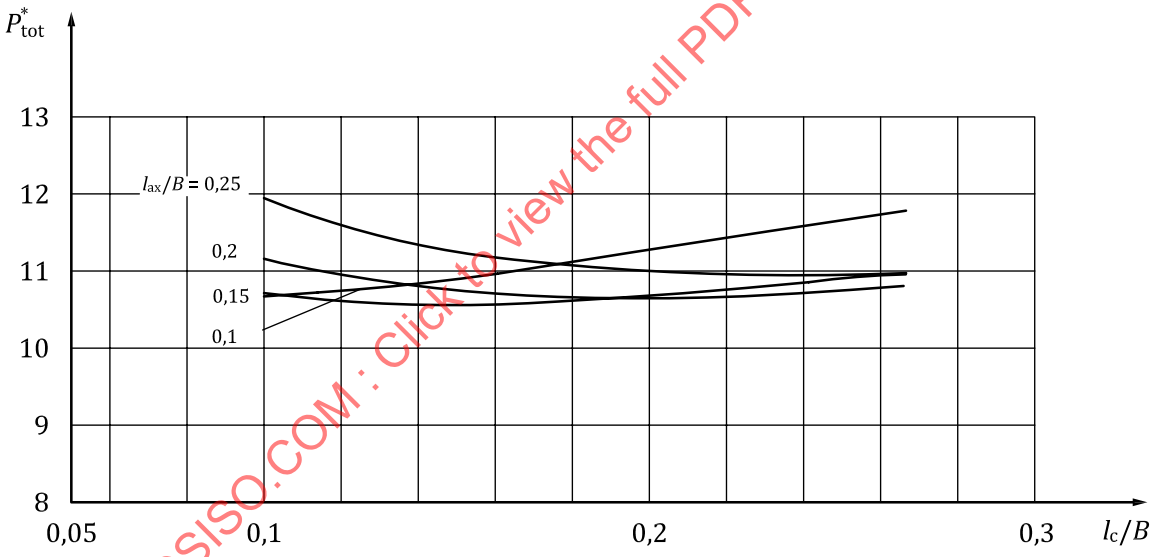


Figure 10 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B, ε = 0,4; B/D = 0,5; P^* = 2; Z = 8; ξ = 1; h_p = 40 × C_R, with friction in the recesses

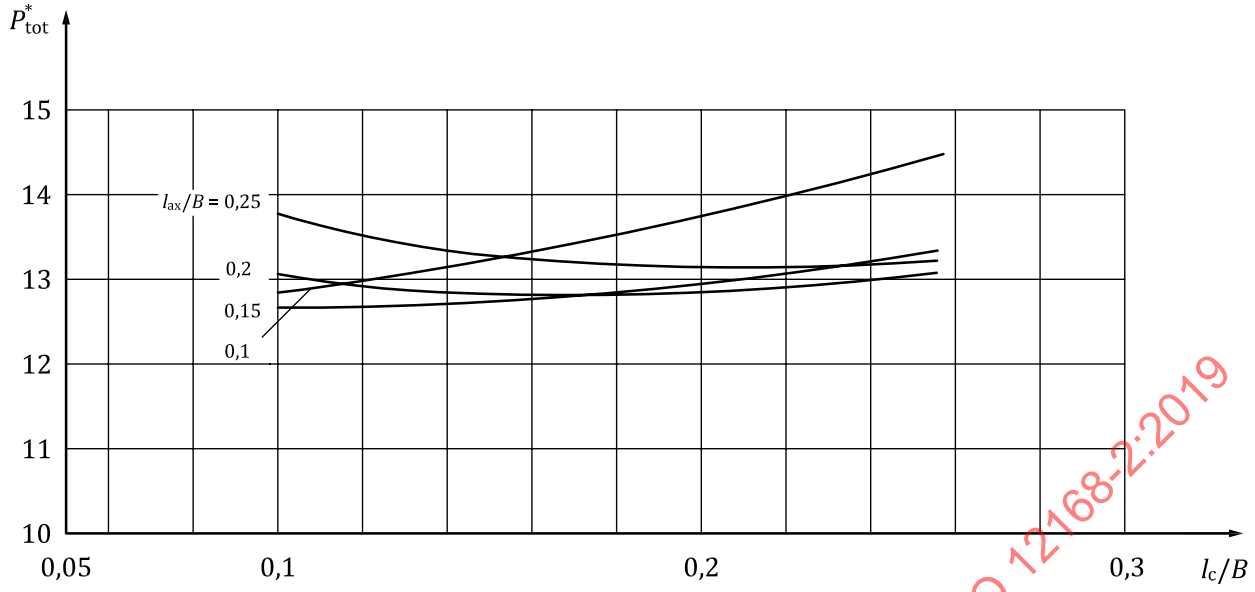


Figure 11 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B, ε = 0,4; B/D = 0,4; P^* = 2; Z = 10; ξ = 1; h_p = 40 × C_R, with friction in the recesses

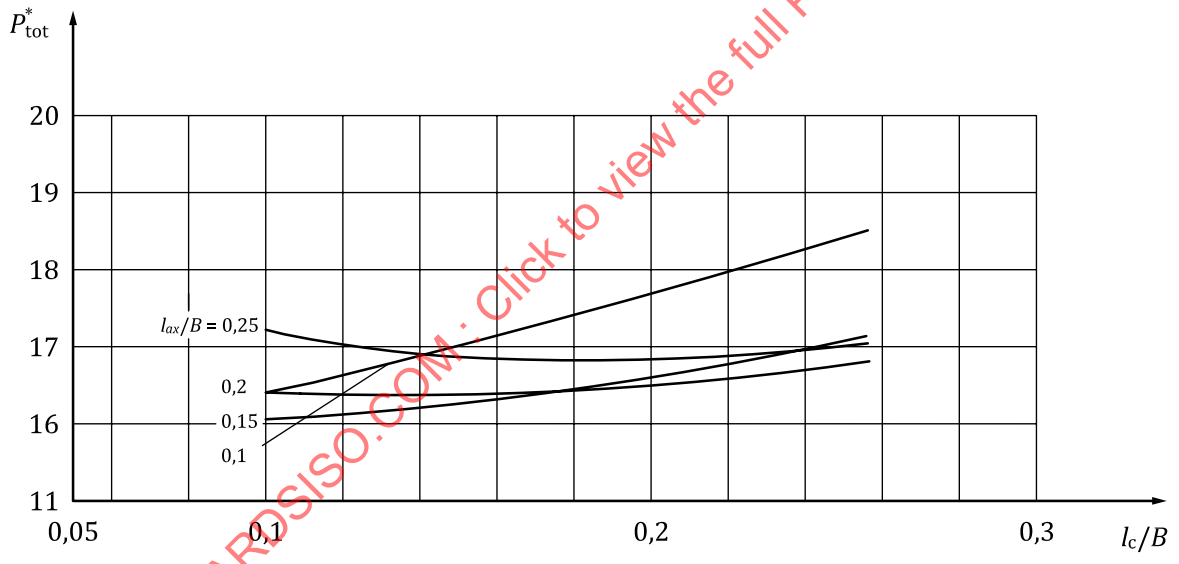


Figure 12 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B, ε = 0,4; B/D = 0,3; P^* = 2; Z = 12; ξ = 1; h_p = 40 × C_R, with friction in the recesses

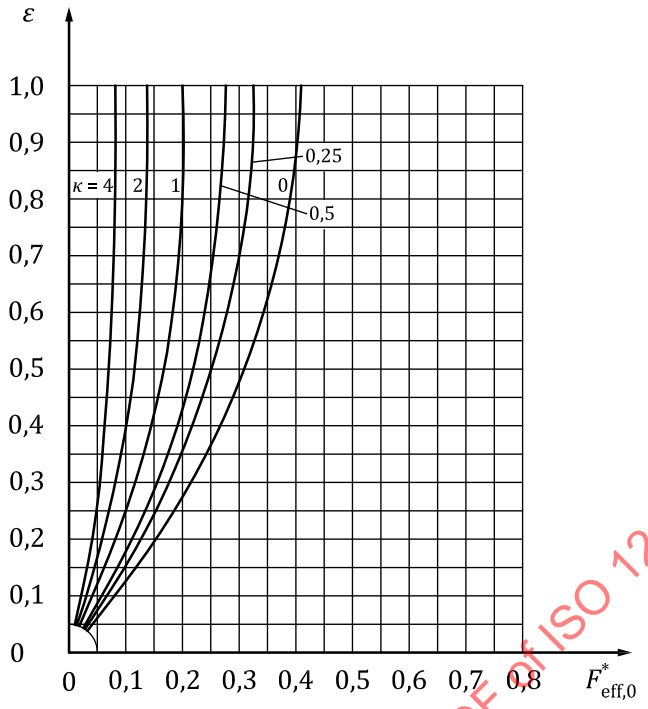


Figure 13 — Relative eccentricities ε as a function of the characteristic values of load-carrying capacity $F^*_{eff,0}$ for different resistance ratios κ and $Z = 3$; load directed to centre of the land[3]

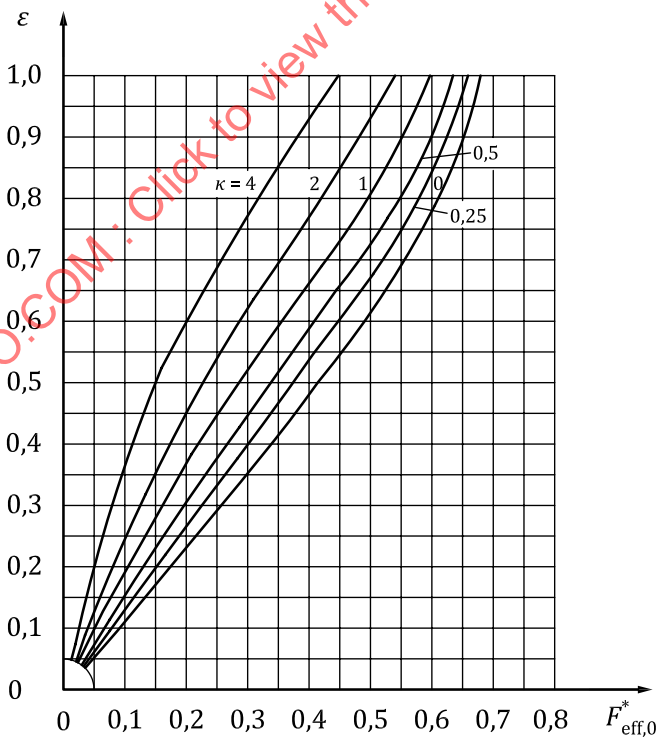


Figure 14 — Relative eccentricities ε as a function of the characteristic values of load-carrying capacity $F^*_{eff,0}$ for different resistance ratios κ and $Z = 3$; load directed to centre of the recess[3]

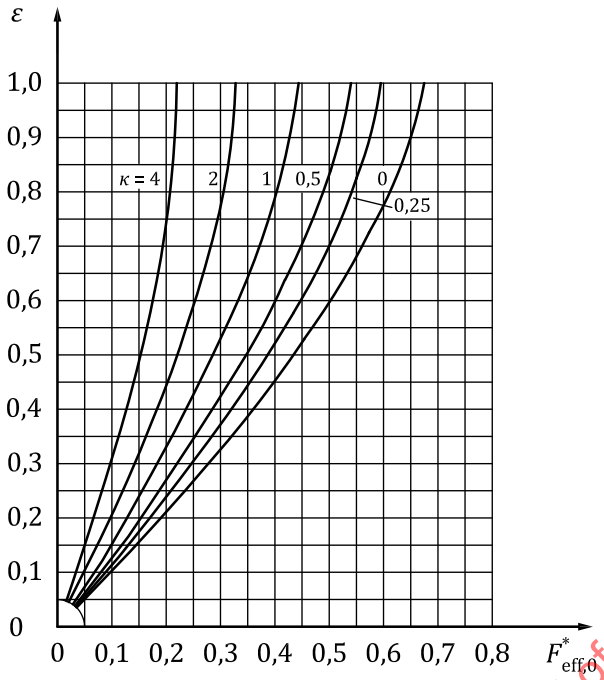


Figure 15 — Relative eccentricities ε as a function of the characteristic values of load-carrying capacity $F^*_{eff,0}$ for different resistance ratios κ and $Z = 4$; load directed to centre of the land[3]

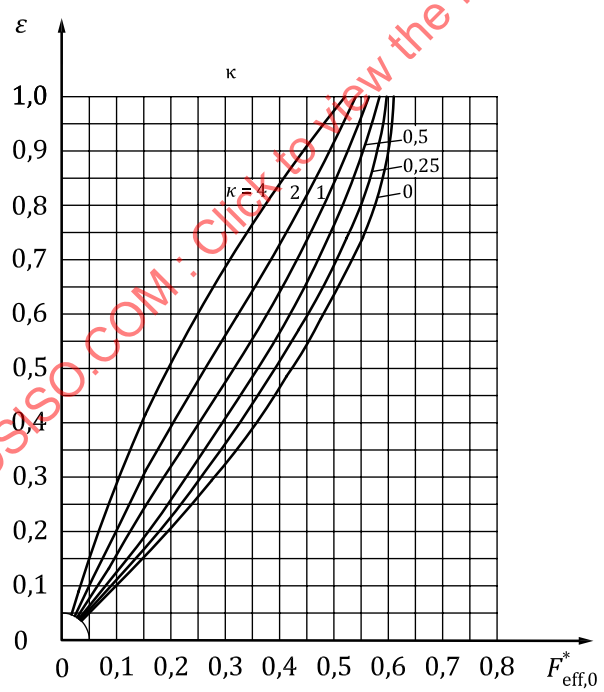


Figure 16 — Relative eccentricities ε as a function of the characteristic values of load-carrying capacity $F^*_{eff,0}$ for different resistance ratios κ and $Z = 4$; load directed to centre of the recess[3]