INTERNATIONAL STANDARD

ISO 12167-2

Second edition
2021-02

Plain bearings — Hydrostatic plain journal bearings with drainage grooves under steady-state conditions —

Part 2: Characteristic values for the calculation of oil-lubricated plain journal bearings with drainage grooves

Paliers lisses — Paliers lisses radiaux hydrostatiques avec rainures d'écoulement fonctionnant en régime stationnaire —

Partie 2: Caractéristiques du calcul pour la lubrification des paliers lisses radiaux avec rainures 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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 12167-2:2001), which has been technically revised.

The main 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 12167 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.

Introduction

The results come from isothermal analysis and are just a first approach of the bearings behaviour and in no case the results can be opposed to those obtained by and published in international documents based on modern theories.

Plain bearings — Hydrostatic plain journal bearings with drainage grooves under steady-state conditions —

Part 2: Characteristic values for the calculation of oil-lubricated plain journal bearings with drainage grooves

1 Scope

This document specifies, in graphic form, characteristic values used in the calculation of oil-lubricated plain journal bearings with drainage grooves.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12167-1, *Plain bearings — Hydrostatic plain journal bearings with drainage grooves under steady-state conditions — Part 1: Calculation of oil-lubricated plain journal bearings with drainage grooves*

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

See Table 1 and Figures 1 to 13.

The characteristic values given in this document shall be provided for the calculation of oil-lubricated hydrostatic plain journal bearings in accordance with ISO 12167-1. 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 12167-1. When designing a plain bearing the characteristic values listed in Table 1 can be used for optimized bearings.

Table 1 — Characteristic values for optimized bearings
ε **= 0,4;** h_p **= 40 ·** C_R**;** α **= 0;** b_G/D **= 0,05;** P^* **= 2;** l_{ax}/B **= 0,1;** ξ **= 1**

Z	B/D	l_c/B	l_c/D	K	$\beta°$	F^*	π_f	P_f^*	Q^*	P_{tot}^*
4	1,00	0,10	0,100	1,416	23,41	0,285 9	1,288	1,531	5,080	10,349
4	0,75	0,12	0,090	0,855	20,64	0,290 9	1,557	1,478	5,375	11,867
6	1,00	0,10	0,100	2,409	16,80	0,270 5	1,299	1,829	6,169	11,954
6	0,75	0,10	0,075	1,642	16,08	0,297 8	1,708	1,606	7,029	13,819
6	0,50	0,11	0,055	0,922	13,88	0,316 1	2,406	1,430	8,280	16,329
8	0,50	0,10	0,050	1,416	11,67	0,313 4	2,537	1,531	9,857	18,597
8	0,30	0,11	0,033	0,712	9,31	0,336 5	3,975	1,332	12,628	23,599
10	0,30	0,10	0,030	1,003	8,34	0,334 4	4,161	1,383	14,366	25,814

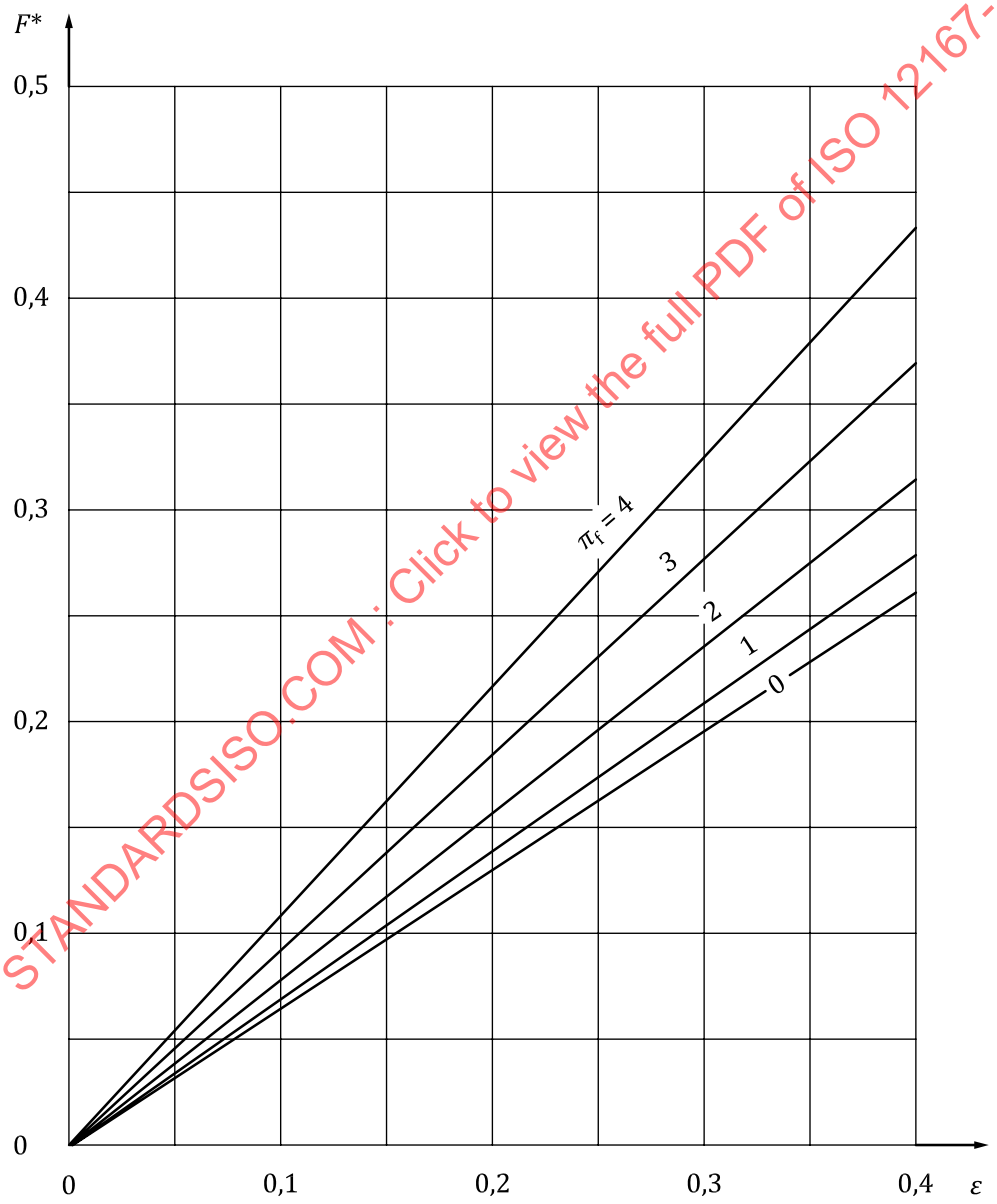

Figure 1 — Characteristic values of load-carrying capacity F^* **as a function of the relative eccentricity** ε **for different relative frictional pressures** π_f **and** Z **= 4;**
B/D **= 1;** l_{ax}/B **= 0,1;** l_c/D **= 0,1;** b_G/D **= 0,05;** ξ **= 1;** α **= 0**

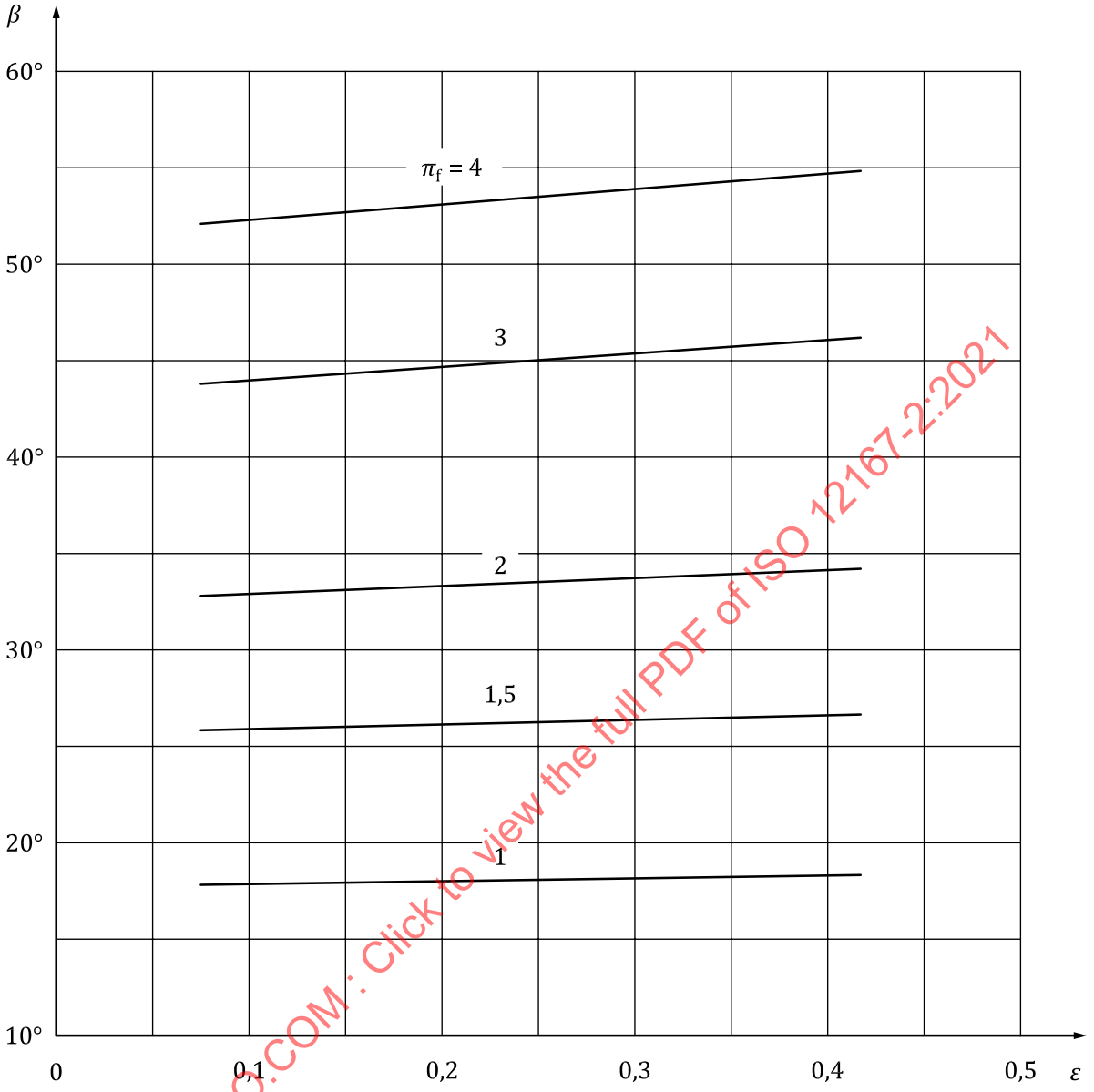

Figure 2 — Attitude angle β as a function of the relative eccentricity ε for different relative frictional pressures π_f and $Z = 4$; $B/D = 1$; $l_{ax}/B = 0{,}1$; $l_c/D = 0{,}1$; $b_G/D = 0{,}05$; $\xi = 1$; $\alpha = 0$

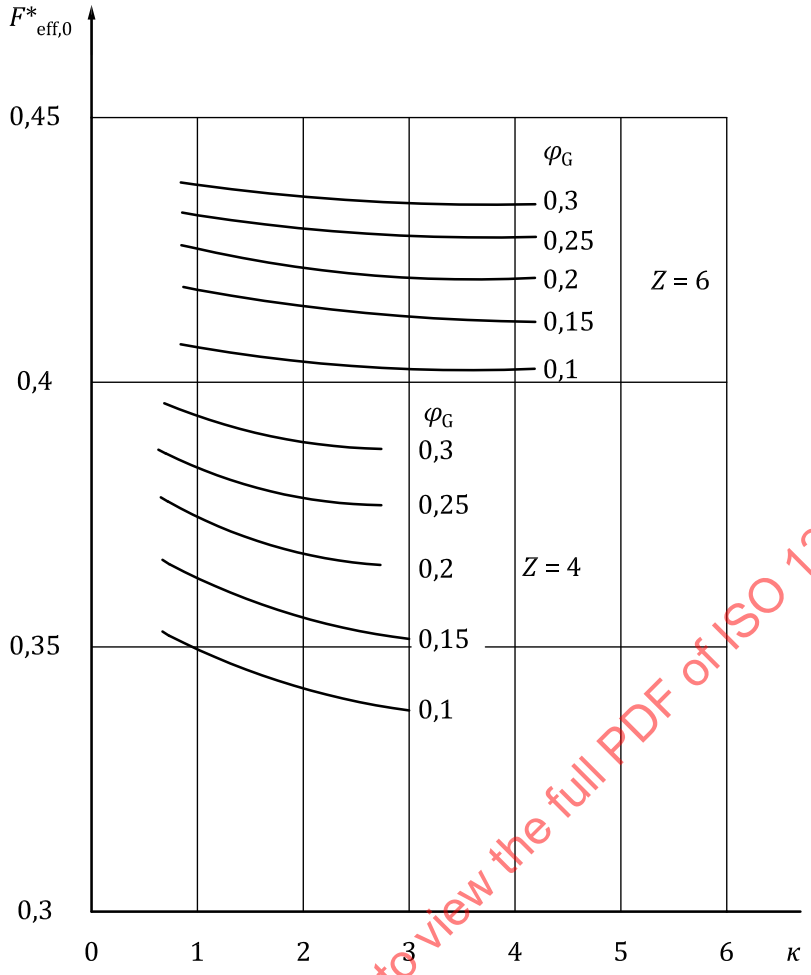

Figure 3 — Characteristic values of load-carrying capacity $F^*_{eff,0}$ for a relative eccentricity $\varepsilon = 0{,}4$ as a function of the resistance ratio κ and for different numbers of recesses Z and φ_G values, $\alpha = 0$; $\omega = 0$; $\xi = 1$

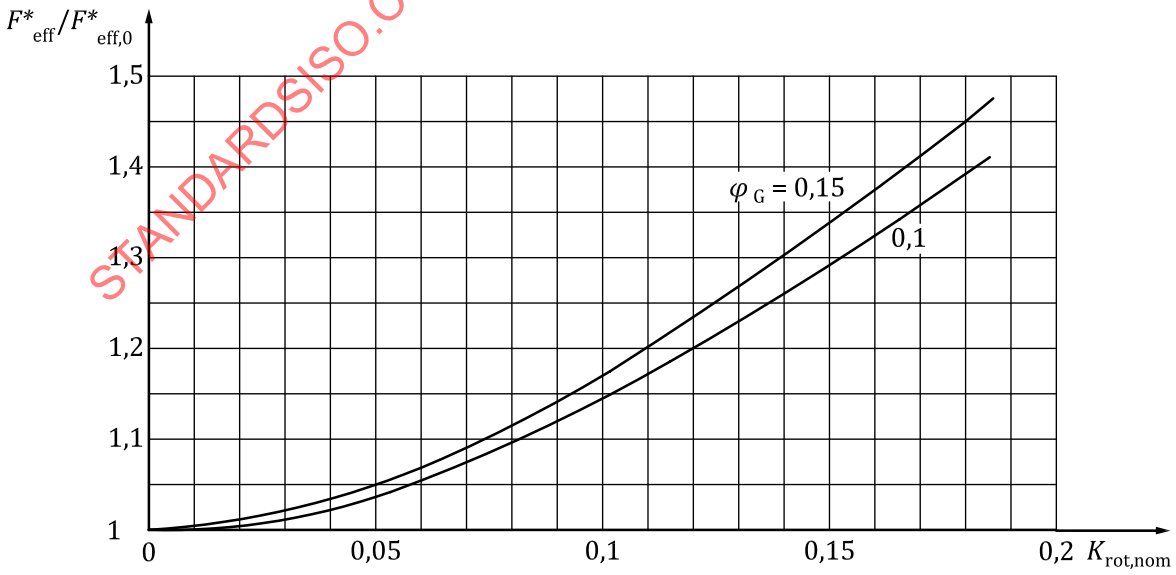

Figure 4 — Ratio of the characteristic values of load-carrying capacity $F^*_{eff} / F^*_{eff,0}$ as a function of the speed-dependent parameter $K_{rot,nom}$ for resistance ratios $\kappa = 1$ to 2, $Z = 4$ and two φ_G values, $\varepsilon = 0{,}4$; $\xi = 1$; $\alpha = 0$

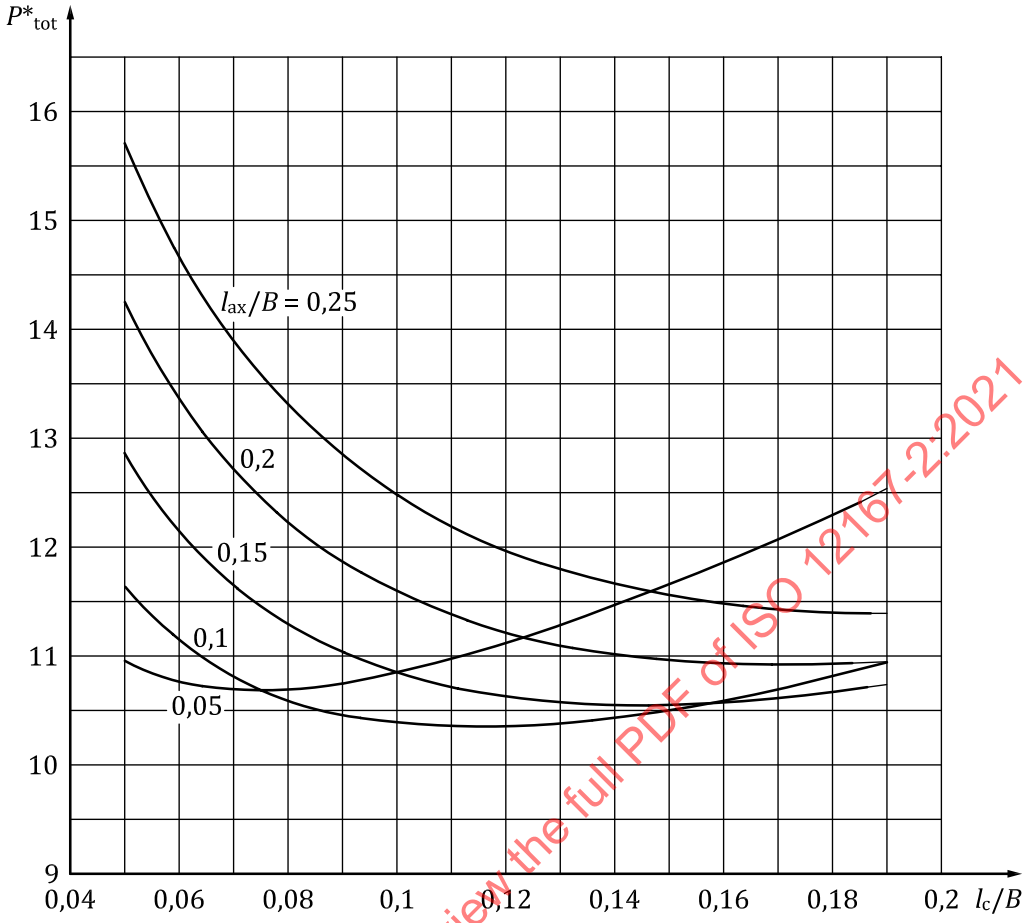

Figure 5 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with $\varepsilon = 0{,}4$; $B/D = 1$; $P^* = 2$; $Z = 4$; $\xi = 1$; $b_G/D = 0{,}05$; $h_p = 40 \cdot C_R$, with friction in the recesses

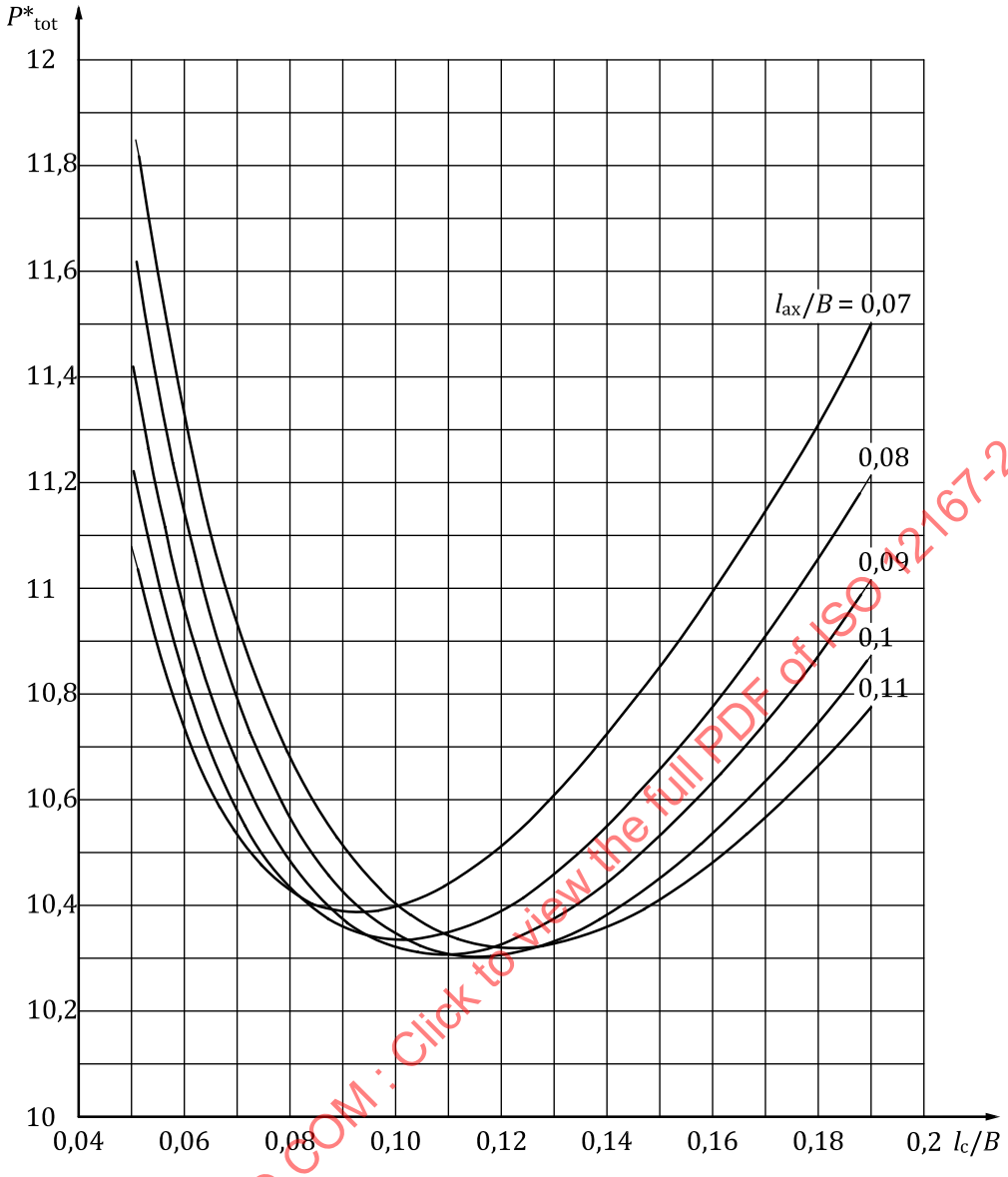

Figure 6 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 1; P^* = 2; Z = 4; ξ = 1; b_G/D = 0,05; $h_p = 40 \cdot C_R$, with friction in the recesses

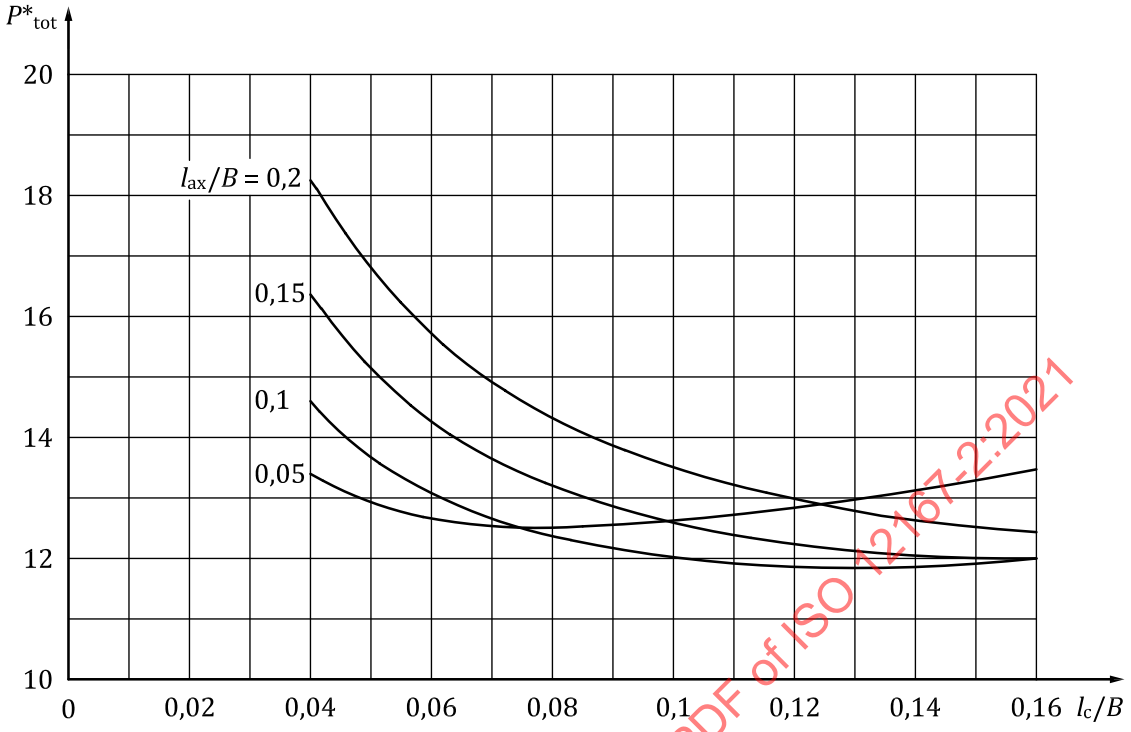

Figure 7 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 1; P^* = 2; Z = 6; ξ = 1; b_G/D = 0,05; $h_p = 40 \cdot C_R$, with friction in the recesses

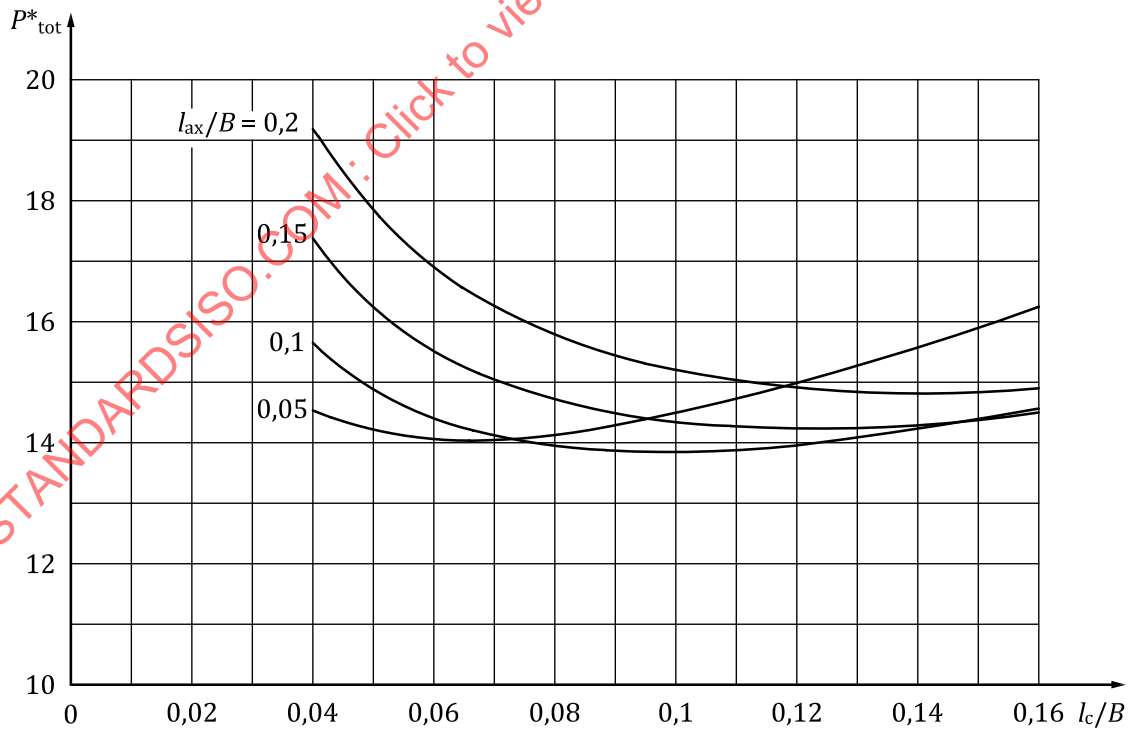

Figure 8 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 0,75; P^* = 2; Z = 6; ξ = 1; b_G/D = 0,05; $h_p = 40 \cdot C_R$, with friction in the recesses

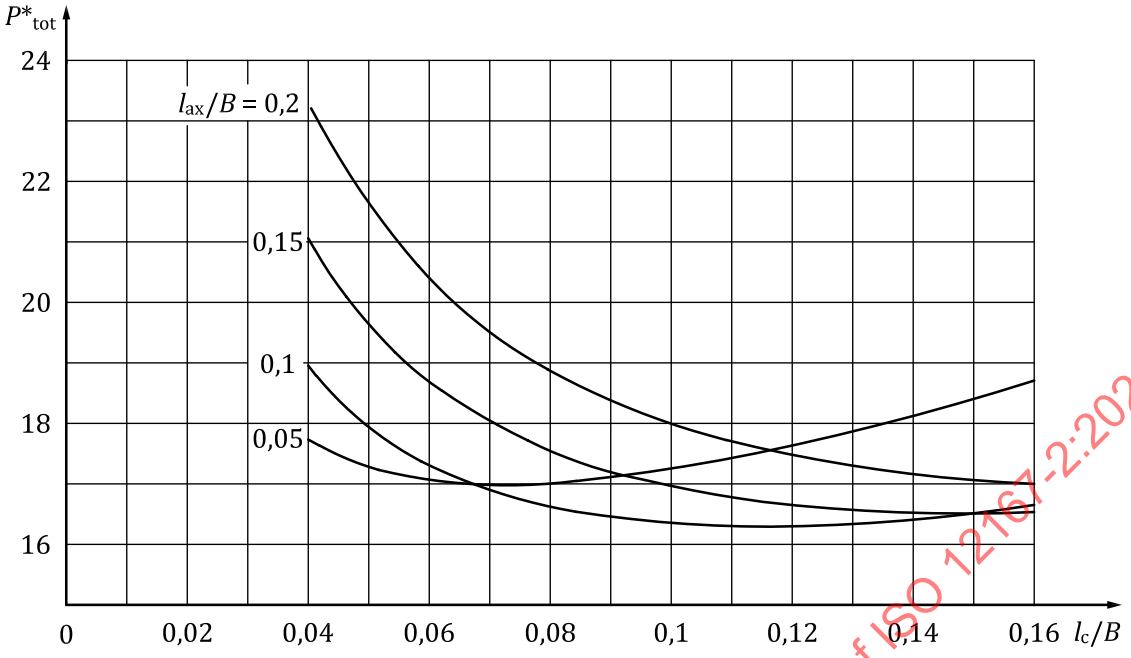

Figure 9 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 0,5; P^* = 2; Z = 6; ξ = 1; b_G/D = 0,05; $h_p = 40 \cdot C_R$, with friction in the recesses

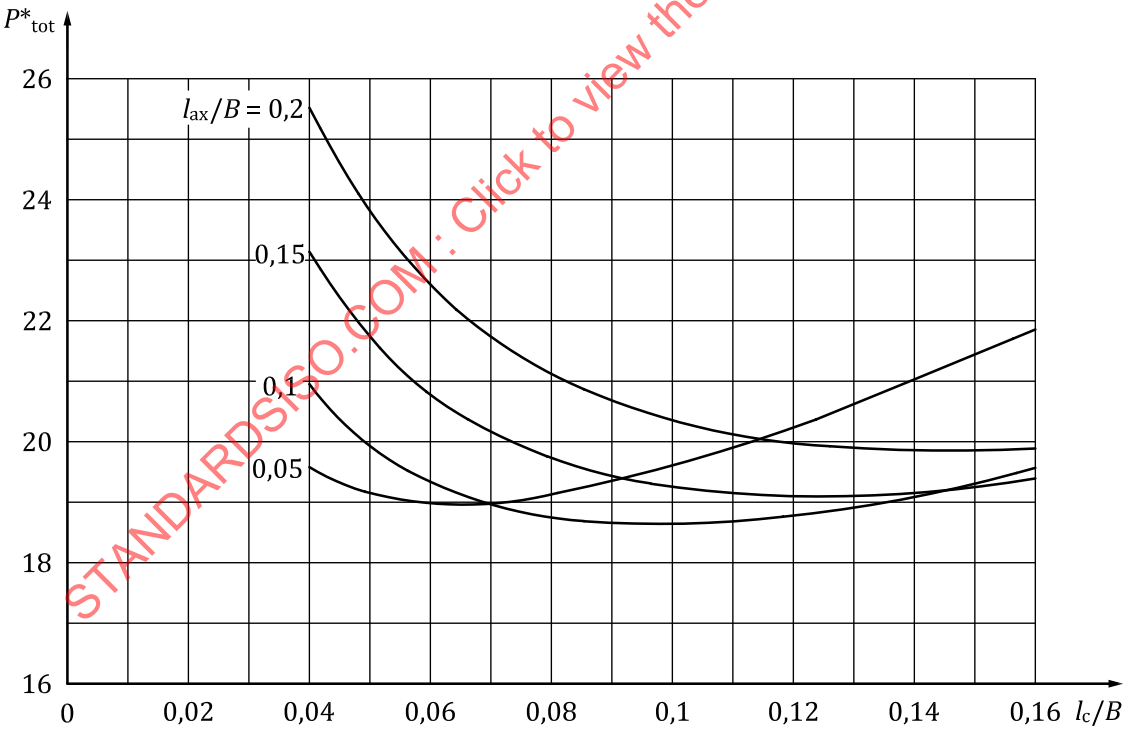

Figure 10 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 0,5; P^* = 2; Z = 8; ξ = 1; b_G/D = 0,05; $h_p = 40 \cdot C_R$, with friction in the recesses