INTERNATIONAL STANDARD

ISO 12167-2

First edition
2001-12-01

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

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

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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.

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 12167 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12167-2 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 4, *Methods of calculation of plain bearings*.

ISO 12167 consists of the following parts, under the general title *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*

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

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 part of ISO 12167 lists, in graphic form, characteristic values used in the calculation of oil-lubricated plain journal bearings with drainage grooves.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 12167. 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 12167 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 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 Characteristic values

See Figures 1 to 13 and Table 1.

The characteristic values given in this part of ISO 12167 are necessary 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.

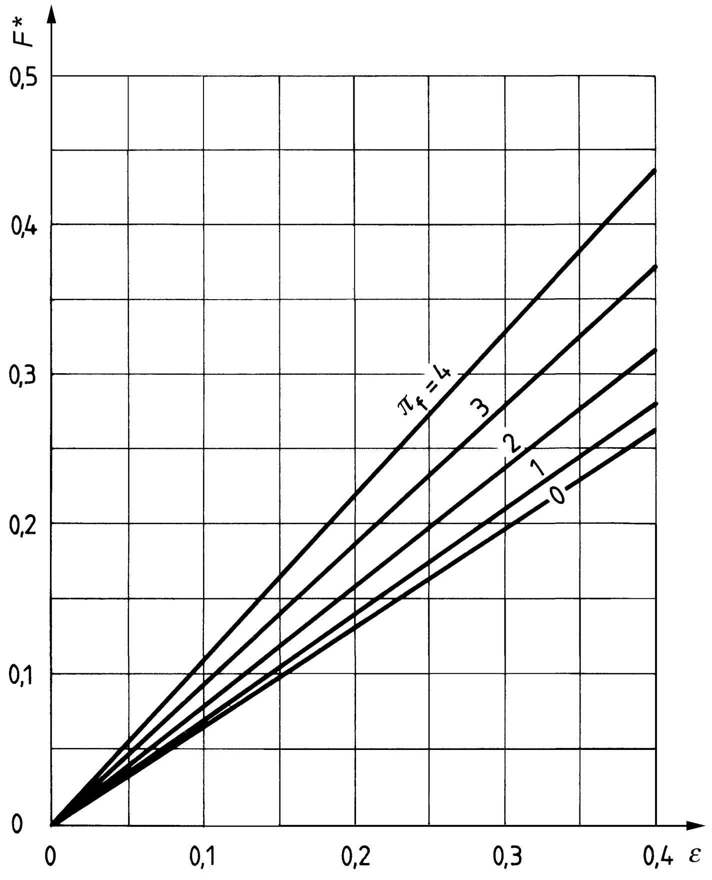

Figure 1 — Characteristic values of load-carrying capacity F^* as a function of the relative eccentricity ε for different relative frictional pressures π_f and four recesses,
B/D = 1; l_{ax}/B = 0,1; l_c/D = 0,1; b_G/D = 0,05; ξ = 1; α = 0

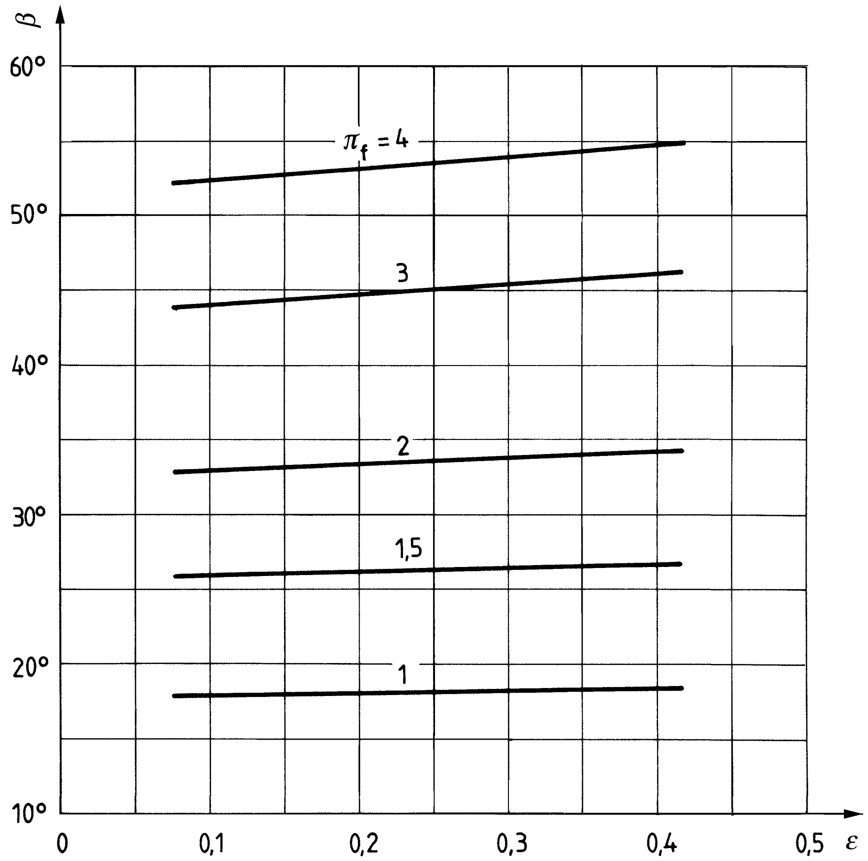

Figure 2 — Attitude angle β as a function of the relative eccentricity ε for different relative frictional pressures π_f and four recesses, B/D = 1; l_{ax}/B = 0,1; l_c/D = 0,1; b_G/D = 0,05; ξ = 1; α = 0

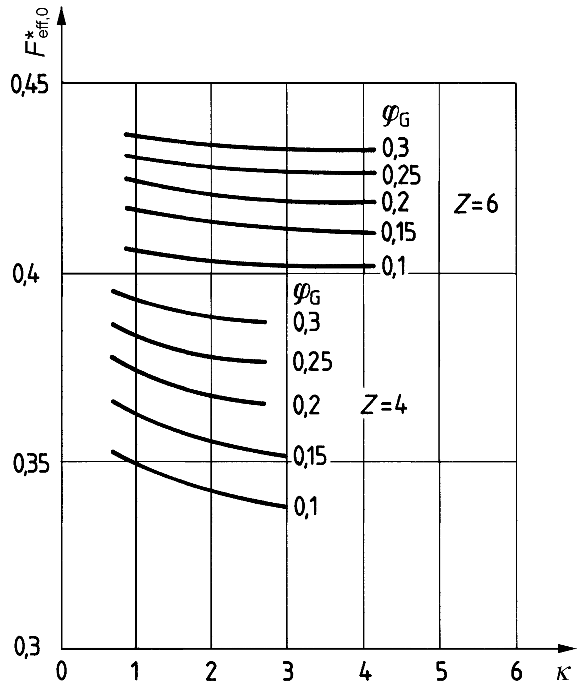

Figure 3 — Characteristic values of load-carrying capacity $F^*_{eff,0}$ for a relative eccentricity ε = 0,4 as a function of the resistance ratio κ and for different numbers of recesses Z and φ_G values, α = 0; ω = 0; ξ = 1 and four recesses

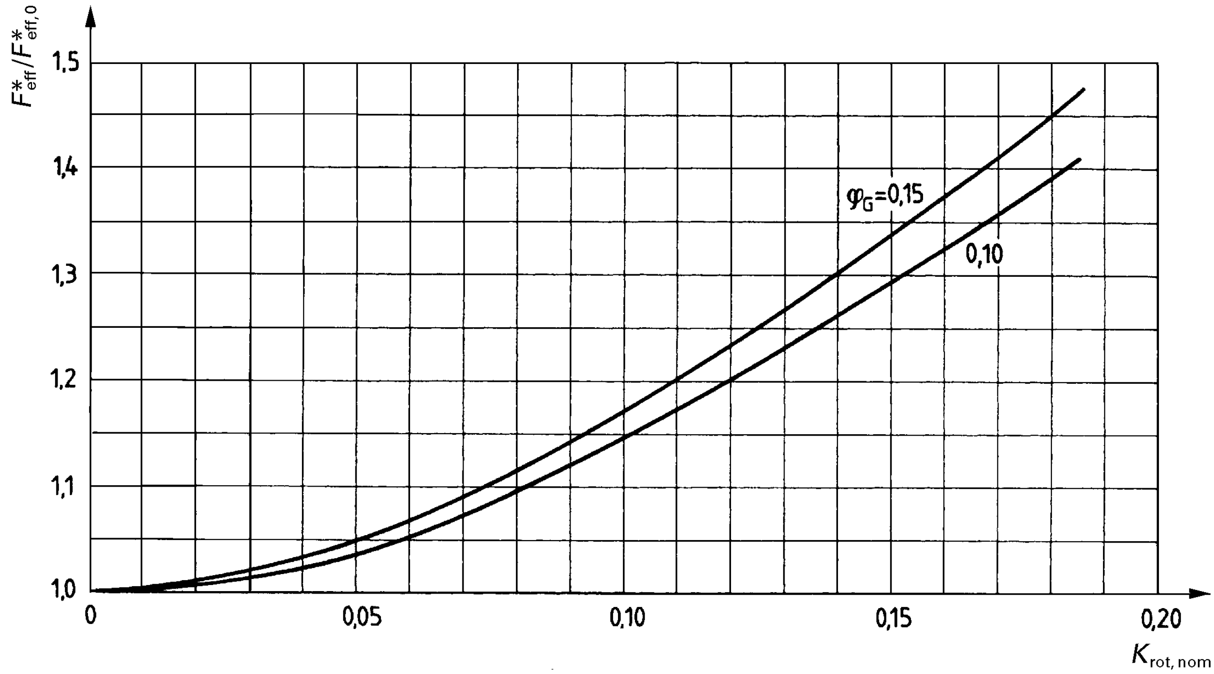

Figure 4 — Ratio of the characteristic values of load-carrying capacity $F^*_{eff} / F^*_{eff,0}$ as a function of the speed-dependent parameter $K_{rot, nom}$ for resistance ratios κ = 1 to 2, four recesses and two φ_G values, ε = 0,4; ξ = 1; α = 0

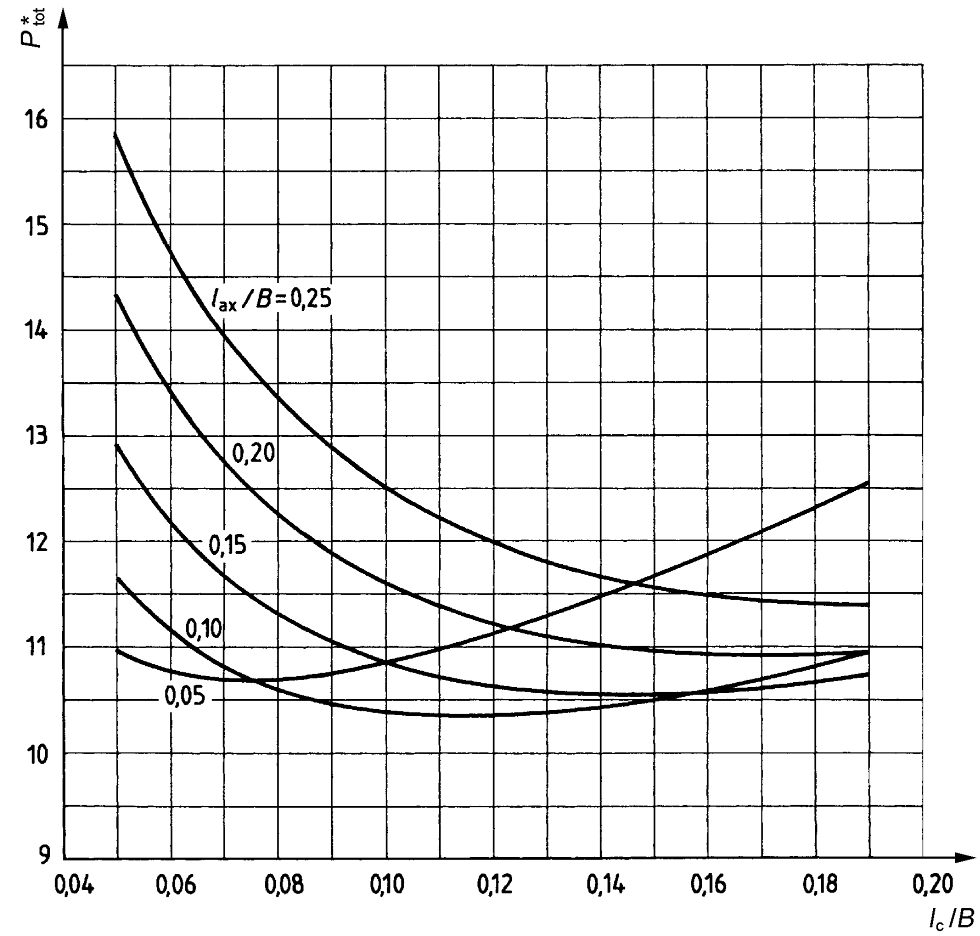

Figure 5 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 1; P^* = 2; Z = 4; b_G/D = 0,056 7; h_p = 40 – C_R, with friction in the recesses

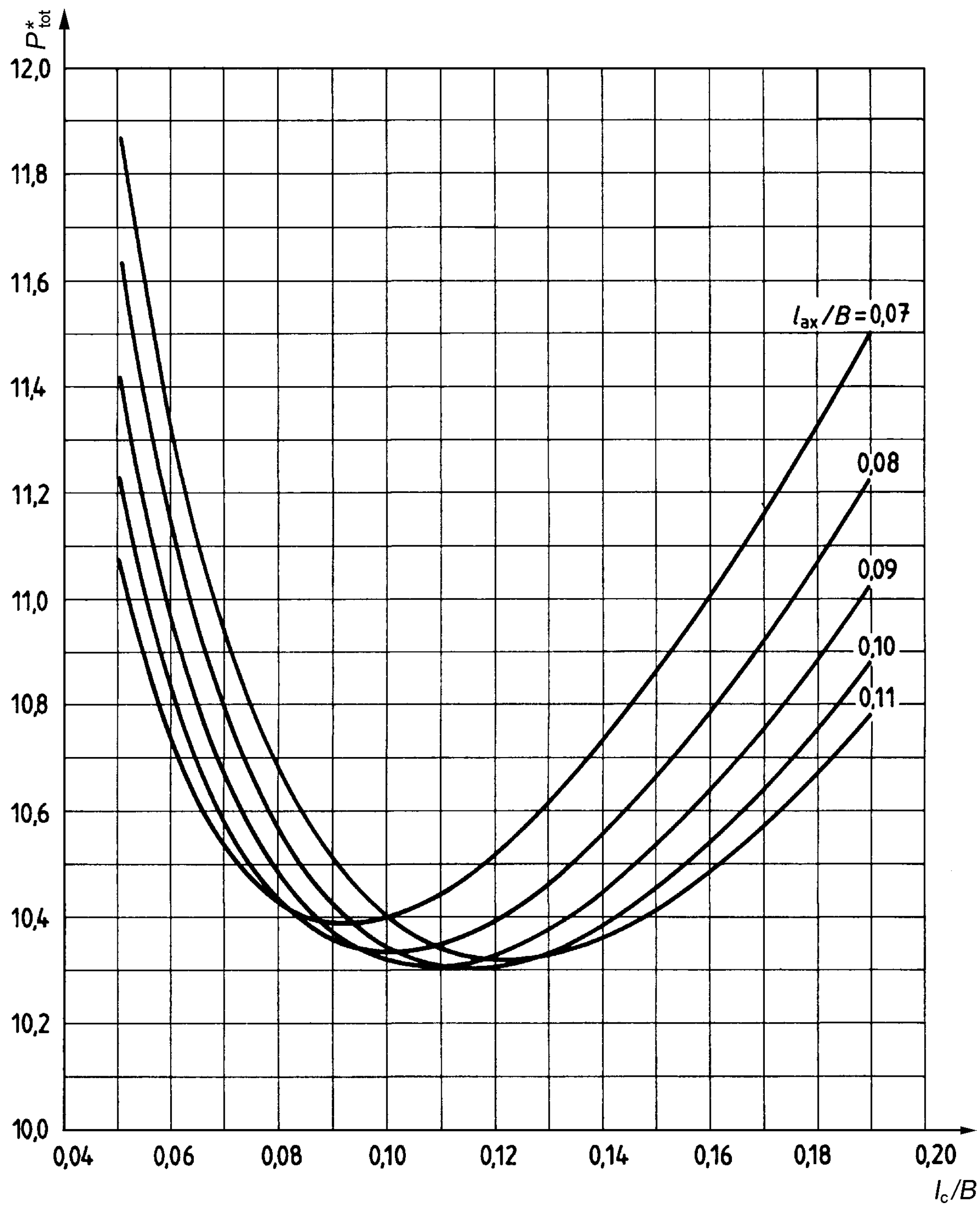

Figure 6 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 1; P^* = 2; Z = 4; b_G/D = 0,05; h_p = 40 – C_R, with friction in the recesses

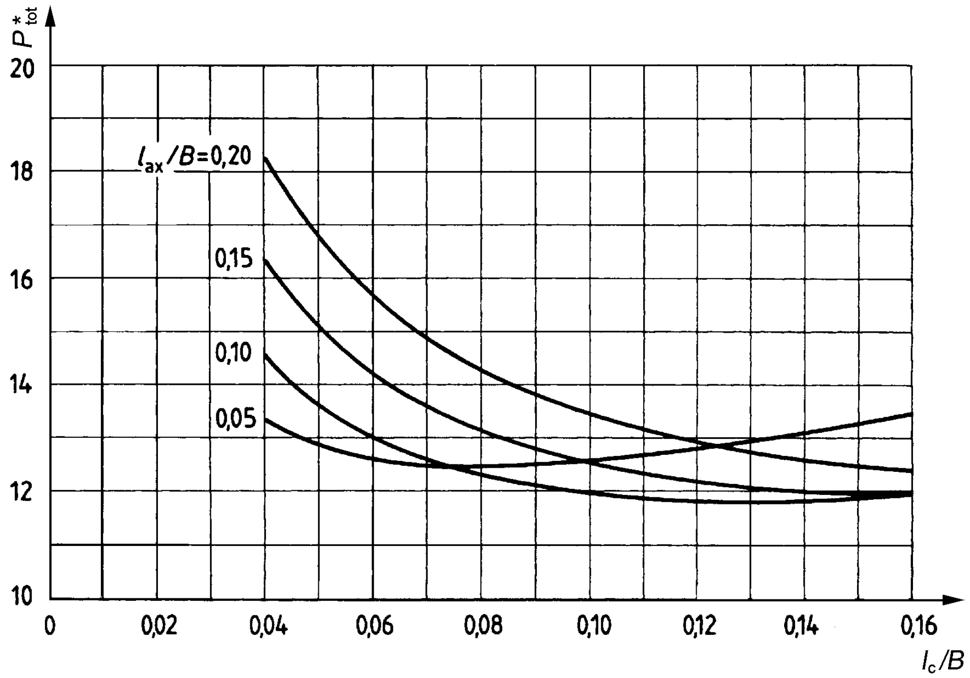

Figure 7 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 1; P^* = 2; Z = 6; ξ = 1; b_G/D = 0,05; h_p = 40 – C_R, with friction in the recesses

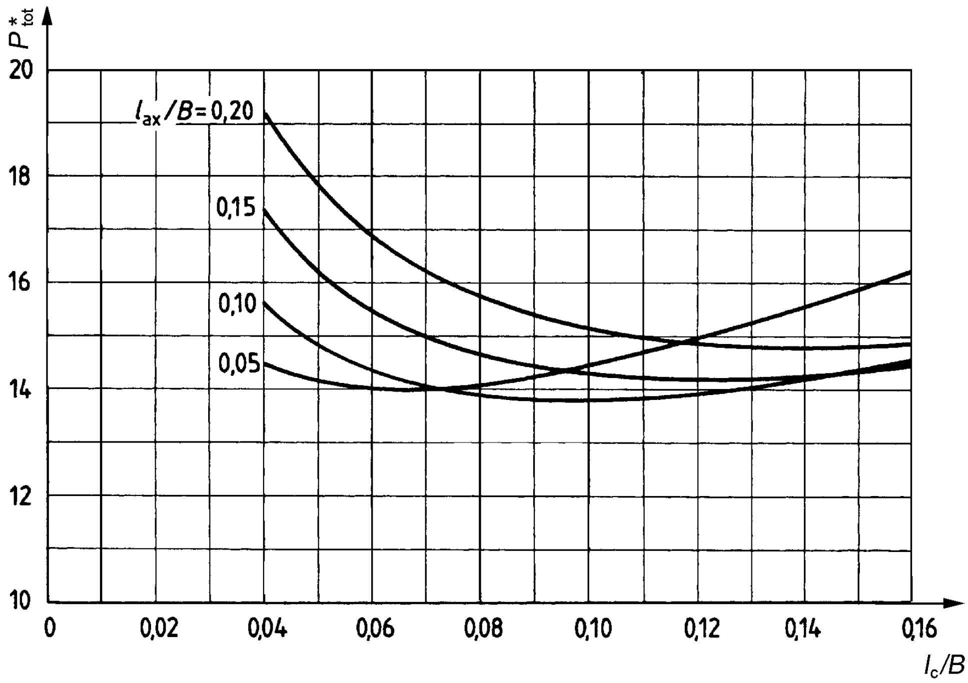

Figure 8 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 0,75; P^* = 2; Z = 6; ξ = 1; b_G/D = 0,05; h_p = 40 – C_R, with friction in the recesses

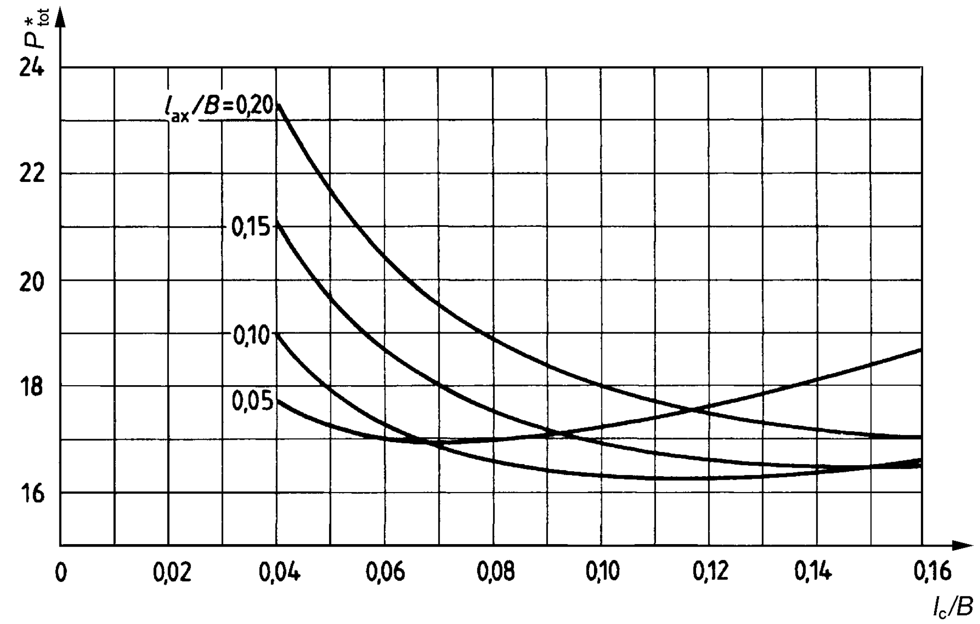

Figure 9 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 0,5; P^* = 2; Z = 6; ξ = 1; b_G/D = 0,05; h_p = 40 – C_R, with friction in the recesses

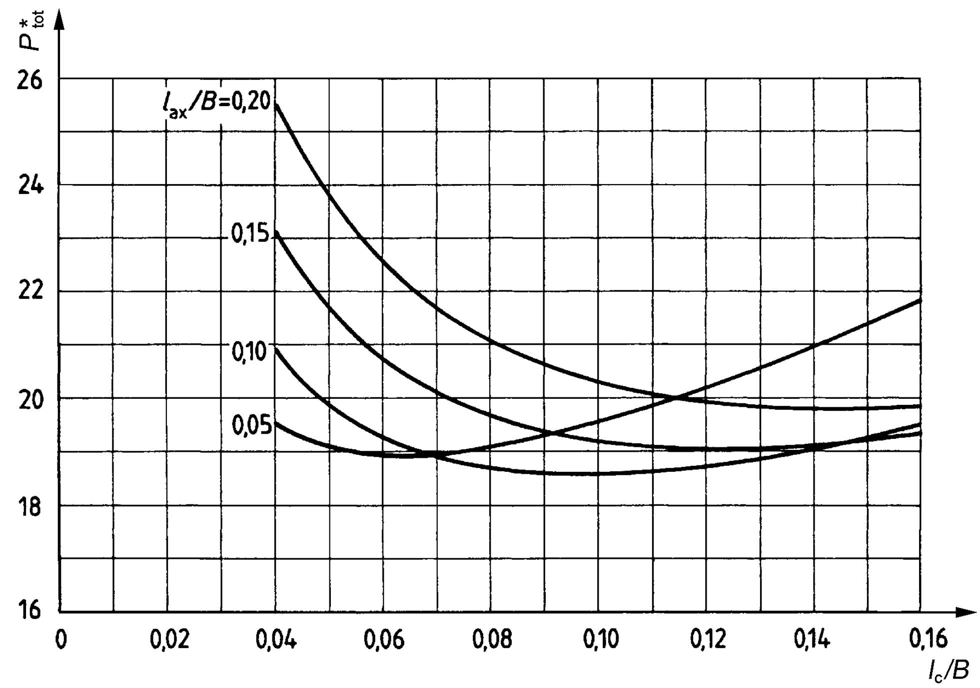

Figure 10 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 0,5; P^* = 2; Z = 8; ξ = 1; b_G/D = 0,05; h_p = 40 – C_R, with friction in the recesses

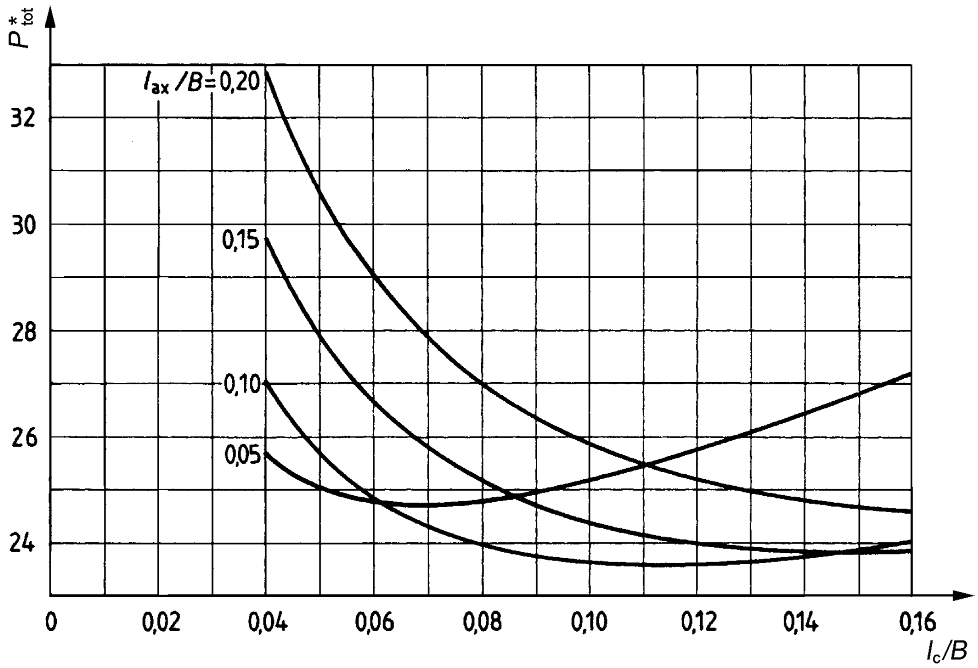

Figure 11 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 0,3; P^* = 2; Z = 8; ξ = 1; b_G/D = 0,05; h_p = 40 – C_R, with friction in the recesses

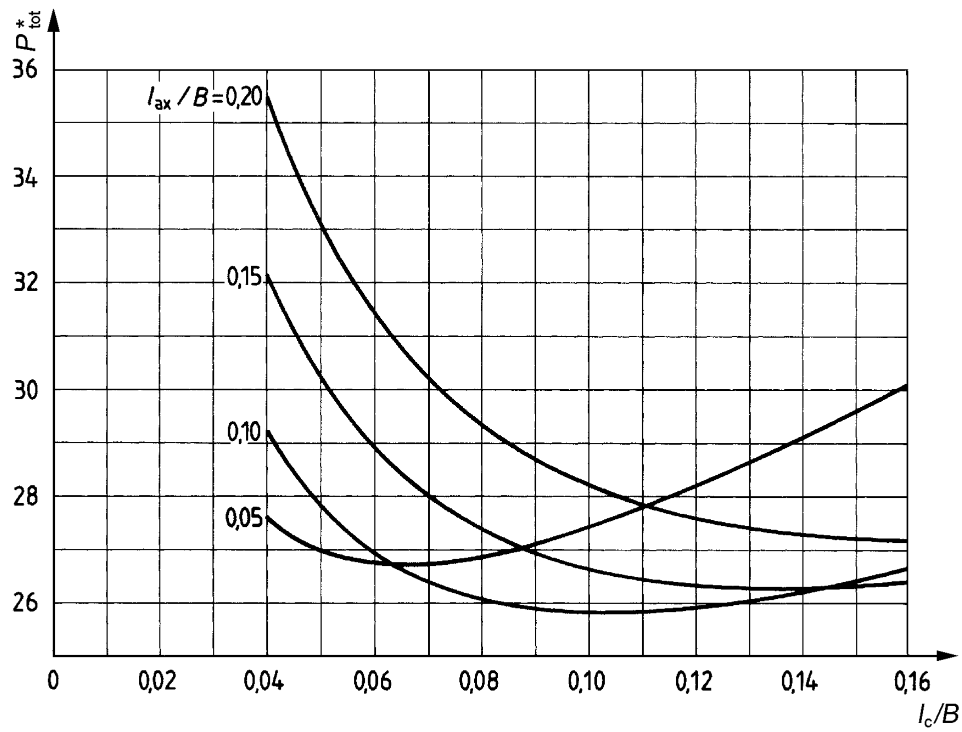

Figure 12 — Characteristic values of total power P^*_{tot} as a function of the relative land widths l_{ax}/B and l_c/B with ε = 0,4; B/D = 0,3; P^* = 2; Z = 10; ξ = 1; b_G/D = 0,05; h_p = 40 – C_R, with friction in the recesses

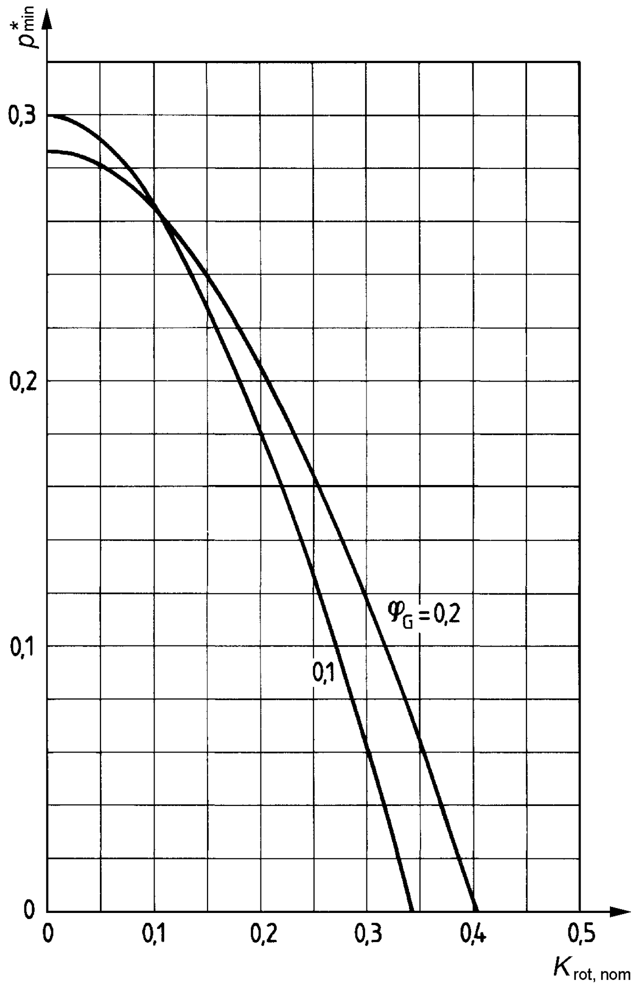

Figure 13 — Minimum relative recess pressures p^*_{min} as a function of the speed dependent parameter $K_{rot, nom}$ for resistance ratios κ = 1 to 2 and two φ_G values, ε = 0,4; B/D = 1; Z = 4; ξ = 1

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

Z	B/D	l_c/B	l_c/D	κ	β°	F^*	F^*_0	π_f	P^*_f	Q^*	P^*_{tot}
4	1	0,1	0,1	1,416	23,41	0,285 9	0,259 9	1,288	1,531	5,08	10,349
4	0,75	0,12	0,09	0,855	20,64	0,290 9	0,269 7	1,557	1,478	5,375	11,867
6	1	0,1	0,1	2,409	16,8	0,270 5	0,263 2	1,299	1,829	6,169	12,954
6	0,75	0,1	0,075	1,642	16,08	0,297 8	0,286	1,708	1,606	7,029	13,819
6	0,5	0,11	0,055	0,922	13,88	0,316 1	0,306 8	2,406	1,43	8,28	16,329
8	0,5	0,1	0,05	1,416	11,67	0,313 4	0,306 9	2,537	1,531	9,857	18,597
8	0,3	0,11	0,033	0,712	9,31	0,336 5	0,332 1	3,975	1,332	12,628	23,599
10	0,3	0,1	0,03	1,003	8,34	0,334 4	0,330 8	4,161	1,383	14,366	25,814

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