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Hydrodynamic plain journal bearings under steady-state conditions — Circular cylindrical bearings —

Part 2: Functions used in the calculation procedure

Paliers lisses hydrodynamiques radiaux fonctionnant en régime stabilisé — Paliers circulaires cylindriques —

Partie 2: Fonctions utilisées pour le calcul

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 7902-2:1998), 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 7902 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.

Hydrodynamic plain journal bearings under steady-state conditions — Circular cylindrical bearings —

Part 2: Functions used in the calculation procedure

1 Scope

This document specifies the values of the basic functions used in the calculation procedure for oil-lubricated circular cylindrical hydrodynamic bearings under conditions of full lubrication.

The values are given for the assumptions and boundary conditions given in ISO 7902-1. The values necessary for the calculation can be determined from the tables of bearing characteristics, the graphs and from the formulae.

The descriptions of the symbols used and calculation examples are given in ISO 7902-1.

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 7902-1, *Hydrodynamic plain journal bearings under steady-state conditions Circular cylindrical bearings — Part 1: Calculation procedure*

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 Tables of basic bearing characteristics

ISO 7902-1:2020, Table 1 shall be referenced to identify the meaning of the symbols used in this document.

Tables 1 to 30 give

— the attitude angle, β,

— the Sommerfeld number, So,

— the specific coefficient of friction, taking account of the unloaded area of lubricant film, f'/φ,

— the specific coefficient of friction in the loaded area of the lubricant film, f/φ, and

— the coefficient of lubricant flow rate, parameter Q_3^*, due to generation of the internal pressure, as a function of angular span, Ω, relative eccentricity ε and relative bearing width B/D for various values of ε, Ω and B/D.

Table 1 — Values of the basic characteristics for Ω = 360° and B/D = 1,5

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	72,523 6	0,427 3	7,599 2	4,968 4	0,047 7
0,4	62,658 8	1,000 5	3,603 5	2,658 2	0,093 5
0,6	51,969 2	1,972 4	2,227 2	1,669 5	0,136 1
0,8	38,160 1	4,682 4	1,365 3	1,073 6	0,175 9
0,9	27,961	10,138 2	0,921 8	0,760 4	0,193 9
0,925	24,618 4	13,825 6	0,790 6	0,667 8	0,198
0,95	19,800 7	22,044	0,617 3	0,535 9	0,201
0,975	13,597 1	48,842 9	0,404	0,358 6	0,203 6

Table 2 — Values of the basic characteristics for Ω = 360° and B/D = 1,25

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	73,342 7	0,341	9,497 8	6,201 6	0,044 4
0,4	62,653 3	0,815 5	4,380 8	3,245 7	0,087 6
0,6	51,390 1	1,671 5	2,583 7	1,925 7	0,128 7
0,8	37,247 4	4,210 7	1,485 5	1,128 5	0,167 9
0,9	27,270 1	9,462 1	0,967 8	0,794 9	0,186
0,925	23,958 6	13,083 9	0,819 7	0,69	0,190 1
0,95	19,304 5	21,127 1	0,633 2	0,548 4	0,193 6
0,975	13,315 4	47,533 2	0,409 7	0,363 1	0,195 9

Table 3 — Values of the basic characteristics for Ω = 360° and B/D = 1

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	74,208	0,249 2	12,958	8,448 9	0,039 4
0,4	62,574 4	0,611	5,786 8	4,272 1	0,078 5
0,6	50,454 5	1,318 2	3,210 2	2,376 1	0,116 4
0,8	36,027 8	3,595 5	1,691 5	1,276 6	0,153 3
0,9	26,368 5	8,520 3	1,045 7	0,853 7	0,170 8
0,925	23,072 6	12,034 2	0,868 2	0,727 5	0,174 8
0,95	18,639 2	19,799	0,659 9	0,569 6	0,178 3
0,975	12,938 8	45,572 1	0,419 3	0,371	0,180 8

Table 4 — Values of the basic characteristics for Ω = 360° and B/D = 0,75

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	75,022	0,158 4	20,390 9	13,237 2	0,032 6
0,4	62,258 4	0,399 3	8,760 6	6,183	0,065
0,6	49,355 4	0,915 5	4,516 7	3,316 1	0,097 2
0,8	34,514 4	2,784 8	2,106 7	1,571 2	0,129 2
0,9	25,188 7	7,161 4	1,197 9	0,969 6	0,144 7
0,925	21,882 3	10,461 1	0,962 7	0,801	0,148 3
0,95	17,739 3	17,736 3	0,711 9	0,611 4	0,151 6
0,975	12,426 4	42,382 9	0,438 4	0,386 9	0,153

Table 5 — Values of the basic characteristics for Ω = 360° and B/D = 0,5

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	75,818 8	0,077 9	41,264 1	26,832 2	0,023 3
0,4	61,762 8	0,202 6	17,087	12,010 1	0,046 8
0,6	47,970 3	0,499 5	8,083 7	5,856 1	0,070 3
0,8	32,965 3	1,74	3,226 7	2,369 8	0,093 8
0,9	23,503 7	5,157 9	1,576 8	1,260 4	0,105 4
0,925	20,317 1	7,916 8	1,205	0,992	0,108 2
0,95	16,529 2	14,175 7	0,844 9	0,719 8	0,110 7
0,975	11,716 4	36,438	0,487	0,415	0,112 8

Table 6 — Values of the basic characteristics for Ω = 360° and B/D = 0,25

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	75,852 2	0,020 9	153,245	99,557 1	0,012 3
0,4	61,484 3	0,056	61,556 7	41,887 9	0,024 6
0,6	47,407 6	0,146	27,106 5	18,705 8	0,036 8
0,8	31,289 6	0,605 3	8,857 7	6,396 1	0,049 2
0,9	21,531 5	2,203 7	3,435 6	2,697 2	0,055 3
0,925	18,530 6	3,670 7	2,399 4	1,942 4	0,056 8
0,95	15,078	7,346 6	1,493 1	1,254 6	0,058 2
0,975	10,779 2	22,666 5	0,714 9	0,563 2	0,059 5

Table 7 — Values of the basic characteristics for Ω = 180° and B/D = 1,5

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	66,676 7	0,378 1	8,571 8	4,556 5	0,038 5
0,4	54,239 5	0,871 1	4,097 2	2,442 4	0,062 8
0,6	44,217 1	1,752 8	2,449 6	1,680 3	0,075 5
0,8	32,582	4,353 1	1,418 2	1,139 1	0,075
0,9	24,256	9,698 7	0,916 1	0,796	0,067 5
0,925	21,517 7	13,445 1	0,784 6	0,678 2	0,063 2
0,95	18,655 7	20,525 9	0,642 3	0,549 5	0,058 9
0,975	12,665 2	47,276 1	0,405 9	0,370 1	0,050 1

Table 8 — Values of the basic characteristics for Ω = 180° and B/D = 1,25

ε	B	So	f'/φ	f/φ	Q_3^*
0,2	67,708 5	0,310 6	10,415	5,514 6	0,036 9
0,4	55,202 7	0,732 6	4,843 1	2,866 6	0,061 5
0,6	44,364 2	1,531 2	2,774 4	1,893 1	0,074 8
0,8	32,449 1	3,981 9	1,529 6	1,224 8	0,074 7
0,9	24,033 7	9,227 9	0,964 3	0,822	0,068 2
0,925	21,247	12,858 4	0,810 6	0,707 5	0,064 2
0,95	18,433	19,947 1	0,654 9	0,558 9	0,060 1
0,975	12,347 1	46,753 5	0,406 6	0,370 6	0,050 7

Table 9 — Values of the basic characteristics for Ω = 180° and B/D = 1

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	69,018 2	0,232 8	13,868 3	7,306 8	0,033 8
0,4	56,409 3	0,560 1	6,286 1	3,687 3	0,057 5
0,6	44,589	1,244 8	3,365 2	2,279 7	0,072 9
0,8	32,368 1	3,451 4	1,731 2	1,379 9	0,073 5
0,9	23,770 1	8,403 7	1,039	0,906 1	0,067 9
0,925	20,898 1	11,940 5	0,857 4	0,744 6	0,064
0,95	18,135 1	18,577 5	0,691	0,589 4	0,060 1
0,975	11,901 7	45,771	0,409 4	0,375 4	0,051 3

Table 10 — Values of the basic characteristics for Ω = 180° and B/D = 0,75

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	70,534 9	0,151 3	21,282 4	11,151 3	0,028 9
0,4	57,855 8	0,381	9,166 3	5,320 7	0,051 3
0,6	45,012 4	0,888 3	4,632 8	3,107 8	0,066
0,8	32,312 8	2,698 7	2,154	1,705	0,069 8
0,9	23,336 7	7,137 5	1,188	1,032 2	0,064 9
0,925	20,438 4	10,425 2	0,954 6	0,827 8	0,061 7
0,95	17,579 3	16,746 5	0,746 9	0,639	0,058
0,975	11,294 8	43,512 8	0,420 4	0,380 1	0,051 3

Table 11 — Values of the basic characteristics for Ω = 180° and B/D = 0,5

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	72,293 9	0,074 7	43,011 7	22,402 8	0,021 3
0,4	58,192 8	0,200 2	17,289 7	9,961	0,039 4
0,6	45,697 1	0,49	8,228 4	5,451 8	0,052 2
0,8	31,575 6	1,722 2	3,249 8	2,550 2	0,057 3
0,9	22,246	5,167 6	1,566 6	1,335 2	0,054 7
0,925	19,751 4	7,843 6	1,210 4	1,039	0,053
0,95	16,593 5	13,85 2	0,862	0,741 9	0,050 8
0,975	10,769 1	38,05 5	0,460 1	0,412	0,045 1

Table 12 — Values of the basic characteristics for Ω = 180° and B/D = 0,25

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	73,936 4	0,019	169,077	87,621 5	0,011
0,4	59,674 3	0,053 7	64,035 4	36,513 5	0,021 4
0,6	45,563 1	0,146 5	27,014 5	16,989 1	0,029 5
0,8	30,521 4	0,605 4	8,852 2	6,047 2	0,033 9
0,9	21,448 2	2,172 5	3,482 1	2,703 6	0,033 4
0,925	19,517 5	3,461 7	2,543	2,011 9	0,033 2
0,95	14,938 5	7,348 5	1,491 6	1,260 3	0,032 1
0,975	9,461 7	23,426 6	0,683 7	0,566 8	0,029 9

Table 13 — Values of the basic characteristics for Ω = 150° and B/D = 1,5

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	61,770 3	0,305 8	10,574 2	4,767 8	0,028 8
0,4	47,933 7	0,738	4,793 3	2,489	0,044 5
0,6	39,850 8	1,554 7	2,718 1	1,659 9	0,052 1
0,8	30,215 2	4,061 6	1,490 5	1,108 2	0,050 1
0,9	23,445 9	9,207 3	0,961 8	0,771 2	0,043 7
0,925	20,432	13,050 8	0,794 9	0,655 1	0,040 3
0,95	17,262	20,569 9	0,630 1	0,525	0,036 5
0,975	12,396	46,556 5	0,408 3	0,35	0,032 5

Table 14 — Values of the basic characteristics for Ω = 150° and B/D = 1,25

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	62,776 5	0,258 8	12,478	5,604	0,028 3
0,4	48,877 3	0,637 4	5,528 2	2,850 1	0,044 5
0,6	40,280 1	1,380 6	3,038 3	1,843 6	0,052 6
0,8	30,231 1	3,747 2	1,598 7	1,184 4	0,050 9
0,9	23,432 6	8,690 6	1,008 3	0,800 2	0,044 7
0,925	20,295 4	12,474 1	0,823 2	0,680 5	0,041 3
0,95	17,159 2	19,833 7	0,647 4	0,542 5	0,037 5
0,975	12,298 7	45,382 6	0,415 4	0,370 5	0,033 4

Table 15 — Values of the basic characteristics for Ω = 150° and B/D = 1

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	64,170 8	0,202 2	15,945	7,122 8	0,026 8
0,4	50,190 4	0,509 9	6,875 9	3,51	0,043 4
0,6	41,135 1	1,143 4	3,631 8	2,175 7	0,052 6
0,8	30,244 5	3,296 7	1,789 7	1,318 9	0,051 1
0,9	22,963 4	8,078 7	1,067 7	0,886 2	0,045
0,925	20,115	11,598 6	0,871 9	0,748 8	0,041 9
0,95	16,946 5	18,783 7	0,674 1	0,563 6	0,038 3
0,975	12,184 4	43,302 6	0,429 4	0,376	0,033 9

Table 16 — Values of the basic characteristics for Ω = 150° and B/D = 0,75

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	65,961 1	0,136 7	23,553 7	10,449 6	0,023 8
0,4	51,996 3	0,356 1	9,782 7	4,927 4	0,04
0,6	42,117 4	0,837 2	4,891 8	2,887 7	0,05
0,8	30,636 7	2,606 8	2,211	1,615 4	0,049 7
0,9	22,669 5	6,943 8	1,211 4	1,000 8	0,044 3
0,925	19,853 4	10,166 2	0,970 4	0,815 5	0,041 5
0,95	16,681 2	16,940 9	0,730 2	0,608	0,038 2
0,975	11,904 4	40,595 3	0,448 8	0,380 9	0,033 7

Table 17 — Values of the basic characteristics for Ω = 150° and B/D = 0,5

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	67,982 1	0,070 6	45,488 2	20,028 9	0,018 4
0,4	54,289 6	0,189 9	18,209 7	9,021 1	0,032 3
0,6	43,007 8	0,477 5	8,429 1	4,915 2	0,041 2
0,8	30,304 7	1,692 7	3,295 1	2,378 5	0,043 1
0,9	22,185 9	5,033 5	1,601 8	1,293	0,040 2
0,925	19,66	7,583 4	1,246	1,022	0,038 5
0,95	16,378 1	13,255 2	0,894 6	0,738 3	0,036 1
0,975	11,467 3	34,970 3	0,501 2	0,424 5	0,031 7

Table 18 — Values of the basic characteristics for Ω = 150° and B/D = 0,25

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	70,141 7	0,018 5	173,657	75,891 2	0,009 9
0,4	56,480 4	0,052 9	65,001 8	31,701 1	0,018 5
0,6	43,946 4	0,144 7	27,351	15,684 6	0,024 8
0,8	29,809 3	0,600 8	8,914 3	6,343 3	0,026 9
0,9	21,215 2	2,153 9	3,509	2,611 2	0,025 9
0,925	18,326 8	3,587 1	2,450 4	1,911 4	0,025 1
0,95	15,853 8	6,827 2	1,603 5	1,270 1	0,024 4
0,975	10,791 7	21,429 5	0,751	0,631 5	0,022 1

Table 19 — Values of the basic characteristics for Ω = 120° and B/D = 1,5

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	56,676 3	0,219 6	14,682 2	5,394 3	0,019 5
0,4	42,036 2	0,553 6	6,325 8	2,743 3	0,028 4
0,6	34,566 2	1,267 2	3,269 2	1,713 3	0,033 5
0,8	27,097 3	3,610 8	1,632 3	1,085 8	0,030 8
0,9	21,230 1	8,726 1	0,988 9	0,768	0,025 4
0,925	19,173 2	12,258 2	0,826 4	0,667 3	0,023 5
0,95	16,245 9	19,760 5	0,642	0,514 8	0,020 9
0,975	12,526 3	42,612 1	0,437 5	0,353 7	0,018 1

Table 20 — Values of the basic characteristics for Ω = 120° and B/D = 1,25

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	58,210 3	0,184 8	17,438 2	6,371 7	0,019 1
0,4	42,953	0,486 9	7,176 7	3,091 1	0,028 7
0,6	35,068 9	1,144 9	3,602 3	1,873 2	0,033 8
0,8	27,206 7	3,366 5	1,738 2	1,151 4	0,031 3
0,9	21,216 3	8,307 8	1,030 4	0,798 4	0,026 3
0,925	19,068 1	11,786 9	0,852 6	0,691 1	0,024 3
0,95	16,196 2	19,095 2	0,659 4	0,530 5	0,022 3
0,975	12,497 1	41,177 5	0,448 8	0,375 1	0,018 9

Table 21 — Values of the basic characteristics for Ω = 120° and B/D = 1

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	59,398 7	0,153	21,036	7,650 6	0,018 8
0,4	44,128 5	0,407 5	8,550 6	3,649 7	0,028 8
0,6	35,883 7	0,977 9	4,191 5	2,157 8	0,033 6
0,8	27,36	3,009 4	1,923 7	1,266 5	0,031 6
0,9	21,254 9	7,658 1	1,104 3	0,852 5	0,027
0,925	18,998 1	11,022 2	0,900 7	0,728 2	0,025 1
0,95	16,145 2	18,053 6	0,689 4	0,541 8	0,022 5
0,975	12,470 2	39,792 4	0,460 6	0,389 6	0,019 7

Table 22 — Values of the basic characteristics for Ω = 120° and B/D = 0,75

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	61,304 5	0,110 2	29,196 2	10,540 9	0,017 5
0,4	45,817 9	0,301	11,530 2	4,858 3	0,027 7
0,6	37,124 9	0,747 1	5,437 2	2,756 5	0,032 8
0,8	27,997 8	2,440 1	2,333 6	1,518 5	0,031 8
0,9	21,183 6	6,656 1	1,245 4	0,956 1	0,027 3
0,925	18,901 5	9,760 2	0,996 9	0,766 5	0,025 5
0,95	15,968 8	16,405 7	0,744	0,590 5	0,022 9
0,975	12,355 1	37,152 8	0,484 9	0,401	0,020 2

Table 23 — Values of the basic characteristics for Ω = 120° and B/D = 0,5

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	63,707 2	0,061 1	52,602	18,817 3	0,014 4
0,4	48,359 7	0,171 3	20,155	8,330 5	0,023 8
0,6	39,012 5	0,444 6	9,021 4	4,469 2	0,029 5
0,8	27,961	1,641 3	3,377 6	2,166 4	0,029 7
0,9	20,901 3	4,956 1	1,614 8	1,227 2	0,026 3
0,925	18,945 4	7,410 6	1,265 9	0,962 4	0,025
0,95	15,685 6	13,250 3	0,887 8	0,691 3	0,022 7
0,975	11,904 8	31,950 5	0,548 1	0,436 5	0,019 9

Table 24 — Values of the basic characteristics for Ω = 120° and B/D = 0,25

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	66,239 9	0,016 9	190,023	67,326 8	0,008 2
0,4	51,432	0,050 7	67,705 1	27,357	0,014 8
0,6	41,159 6	0,138 7	28,511 7	13,726 9	0,019
0,8	28,646 6	0,589 2	9,077 7	5,683 1	0,019 9
0,9	20,788 5	2,124 4	3,552 3	2,517 7	0,018 5
0,925	17,974 1	3,548 5	2,472 8	1,878 2	0,017 6
0,95	14,837 7	7,037 8	1,551 2	1,195 1	0,016 5
0,975	11,015 9	20,770 2	0,773 9	0,609 1	0,015 3

Table 25 — Values of the basic characteristics for Ω = 90° and B/D = 1,5

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	53,340 2	0,117 6	27,355	7,627 6	0,011 4
0,4	37,166 5	0,330 1	10,503 4	3,54	0,015 9
0,6	28,916 7	0,864 2	4,688 1	1,975 8	0,017 4
0,8	23,203 7	2,881 7	1,974 6	1,104 1	0,015 1
0,9	18,831 5	7,636 6	1,089	0,748 7	0,012 5
0,925	17,184 5	11,026 1	0,886 5	0,623 5	0,011 5
0,95	14,926 5	18,268 3	0,673 1	0,509 7	0,010 5
0,975	11,529 4	40,891 4	0,443 2	0,354 1	0,009 7

Table 26 — Values of the basic characteristics for Ω = 90° and B/D = 1,25

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	54,116 5	0,106 9	30,061 7	8,360 5	0,011 5
0,4	37,610 1	0,307 4	11,266	3,786	0,016 1
0,6	29,198 4	0,800 8	5,05	2,114 5	0,017 8
0,8	23,378 2	2,719	2,084 4	1,160 5	0,015 8
0,9	18,857	7,317 6	1,130 4	0,775 2	0,013 1
0,925	17,239 6	10,598 2	0,917 2	0,645 1	0,012 1
0,95	14,908	17,588 5	0,694 2	0,519	0,011
0,975	11,511 7	39,939 2	0,451 3	0,360 1	0,009 9

Table 27 — Values of the basic characteristics for Ω = 90° and B/D = 1

ε	β	So	f'/φ	f/φ	Q_3^*
0,2	55,814 5	0,089 3	35,979 2	9,946 3	0,011 2
0,4	38,693 2	0,266	13,010 3	4,335	0,016 3
0,6	29,800 6	0,710 5	5,6762	2,356 7	0,018 3
0,8	23,653 6	2,477 4	2,274	1,257 6	0,016 5
0,9	19,043	6,803	1,206 2	0,823 3	0,013 8
0,925	17,202 1	10,011 5	0,962 6	0,673 5	0,012 6
0,95	14,919 6	16,815 8	0,720 6	0,537 7	0,011 5
0,975	11,480 1	38,478 5	0,464 5	0,369 9	0,010 3