INTERNATIONAL STANDARD

ISO
10792-2

First edition
1995-07-15

Aerospace — Airframe spherical plain bearings in corrosion-resisting steel with self-lubricating liner —

Part 2:
Inch series

Aéronautique — Rotules en acier résistant à la corrosion, à garniture autolubrifiante, utilisées dans la structure des aéronefs —

Partie 2: Séries en inches

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.

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.

International Standard ISO 10792-2 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 15, *Airframe bearings*.

ISO 10792 consists of the following parts, under the general title *Aerospace — Airframe spherical plain bearings in corrosion-resisting steel with self-lubricating liner* :

— *Part 1: Metric series*

— *Part 2: Inch series*

— *Part 3: Technical specification*

Annexe A of this part of ISO 10792 is for information only.

Aerospace — Airframe spherical plain bearings in corrosion-resisting steel with self-lubricating liner —

Part 2:
Inch series

1 Scope

This part of ISO 10792 specifies the characteristics of spherical plain bearings in corrosion-resisting steel with self-lubricating liner, narrow and wide series, for elevated loads at ambient temperature, for use in fixed or moving parts of the aircraft structure and control mechanisms at temperatures of −55 °C to +163 °C.

It is applicable to self-lubricating spherical plain bearings (without rolling elements) consisting of an outer ring having a concave sphered sliding contact surface with self-lubricating liner and inner ring having a matched convex sphered sliding contact surface.

At the time that this part of ISO 10792 was developed, airframe spherical plain bearings with dimensions originally specified in Imperial units were dominant in world application. For this part of ISO 10792, the dimensions of these bearings have been converted into metric units with the original characteristics given in annex A for information only.

For new applications, the use of the bearings specified in ISO 10792-1 is recommended.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 10792. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 10792 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 683-16:1976, *Heat-treated steels, alloy steels and free-cutting steels — Part 16: Precipitation hardening stainless steels.*

ISO 683-17:1976, *Heat-treated steels, alloy steels and free-cutting steels — Part 17: Ball and roller bearing steels.*

ISO 1132:1980, *Rolling bearings — Tolerances — Definitions.*

ISO 6811:1983, *Spherical plain bearings — Vocabulary.*

ISO 8075:1985, *Aerospace— Surface treatment of hardenable stainless steel parts.*

ISO 10792-1:1995, *Aerospace — Airframe spherical plain bearings in corrosion-resisting steel with self-lubricating liner — Part 1: Metric series.*

ISO 10792-3:1995, *Aerospace — Airframe spherical plain bearings in corrosion-resisting steel with self-lubricating liner — Part 3: Technical specification.*

3 Definitions

For the purposes of this part of ISO 10792, the definitions given in ISO 6811 and ISO 10792-1 apply. In addition, definitions of the concepts related to the tolerances specified in this part of ISO 10792 are given in ISO 1132.

4 Symbols

For the purposes of this part of ISO 10792, the symbols given in ISO 1132 and ISO 10792-1 apply.

5 Characteristics

5.1 Dimensions and tolerances

The dimensions and tolerances for narrow-series spherical plain bearings shall conform to table 1; those for wide-series spherical plain bearings shall conform to table 2.

The configuration of spherical plain bearings shall conform to either figure 1 for those without face grooves or to figure 2 for those with face grooves.

5.2 Mass

The mass of spherical plain bearings shall conform to the values given in tables 1 and 2.

5.3 Loads and starting torques

Loads and starting torques shall conform to the values given in table 3 for narrow-series bearings and to those given in table 4 for wide-series bearings.

5.4 Materials

Inner ring Bearing steel, type 21, in accordance with ISO 683-17, quenched and tempered, except for hardnesses 55 HRC to 62 HRC.

Outer ring Bearing steel, type 1, in accordance with ISO 683-16, except with maximum molybdenum content of 0,5 %, heat treatment R 093, hardnesses 28 HRC to 37 HRC, before swaging.

Liner Self-lubricating, wear-resisting material with a low coefficient of friction.

5.5 Surface treatment

A surface treatment shall be applied to the inner ring material in accordance with ISO 8075. The application of this same surface treatment to the outer ring material is optional.

6 Technical specification

Spherical plain bearings supplied in accordance with this part of ISO 10792 shall conform with the requirements of ISO 10792-3.

7 Designation

Each spherical plain bearing in accordance with this part of ISO 10792 shall be designated as in the following example.

Description block — Identity block

Bearing, spherical plain — ISO 10792 B G 08 W

Number of this International Standard —

Series —
  B = inch series

Type —
  T = without face groove
  G = with face groove

Diameter code —
  (See tables 1 and 2)

Series code —
  N = narrow
  W = wide

8 Marking

In addition to the manufacturer's identification, each spherical plain bearing shall be marked using the identity block as defined in clause 7. Marking position and method are at the manufacturer's option but shall not adversely affect the working of the spherical plain bearing.

Dimensions in millimetres
Surface roughness values in micrometres

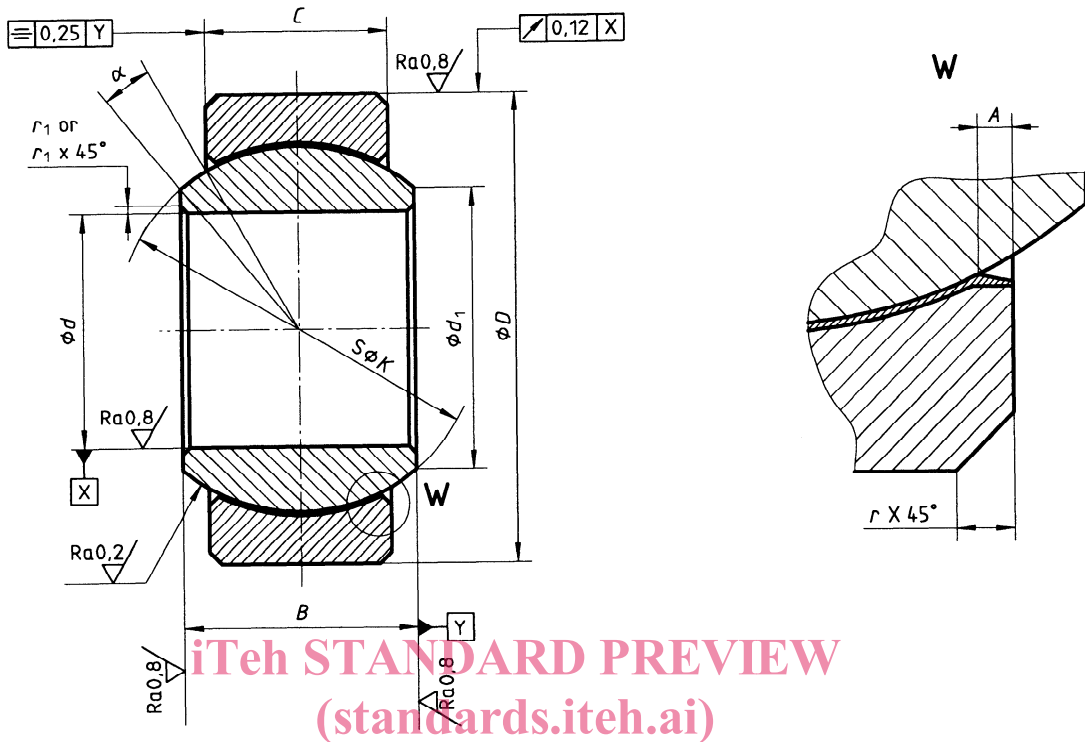**Figure 1 — Spherical plain bearing with self-lubricating liner without face groove**

Dimensions in millimetres
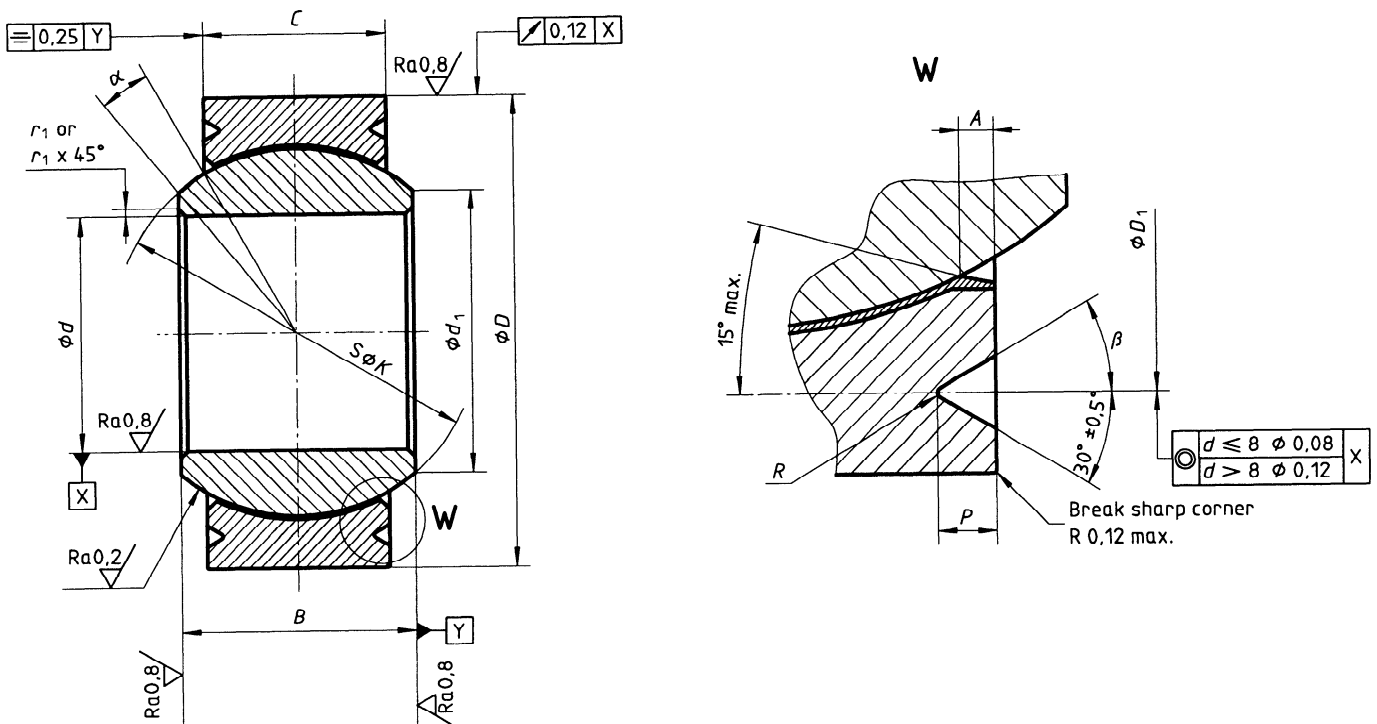Surface roughness values in micrometres

Figure 2 — Spherical plain bearing with self-lubricating liner with face groove

Table 1 — Narrow series — Dimensions, tolerances and masses

Dimensions in millimetres
Tolerances in micrometres

Diameter code	d	D	C +127 −127	B 0 −51	Δ_{dmp}	Δ_{ds}	Δ_{Dmp}	Δ_{Ds}	d_1 min.	r_1	r 0 −254	A max.	D_1 0 −203	P 0 −254	R	K ref.	β ±0,5°	α[1] min.	Mass ≈ g
03	4,826	14,288	5,54	7,137					7,74				12,7		0,127 to 0,254	10,312			9
04	6,35	16,668	6,35	8,712					9,25		0,508	0,762	15,09	0,635		12,7	20°	10°	9
05	7,938	19,05	7,14	9,525					10,64				16,81			14,275			14
06	9,525	20,638	7,92	10,312		0 −13		0 −13	12,06				18,08	0,889		15,875		9°	18
07	11,112	23,018	8,71	11,1					13,46			0,889	20,47			17,45			23
08	12,7	25,4	9,91	12,7					15,24		0,762		22,25			19,837		8°	32
09	14,288	27,78	11,1	14,275					17,02	0,127 to 0,381			24,54			22,2			41
10	15,875	30,162	12,7	15,875	0 −13		0 −13		18,77			1,016	27			24,587			54
12	19,05	36,512	15,06	19,05					23,37				33,35		0,254 to 0,432	30,15			95
14	22,225	39,688	17,86	22,225					24,89				36,52			33,376	30°		122
16	25,4	44,45	20,24	25,4		+3 −15		+6 −19	28,4				41,3	1,397		38,1		9°	177
20	31,75	50,8	23,92	27,762					36,42		1,016	1,143	47,65			45,8		5,5°	240
24	38,1	61,912	28,7	33,325					46,42				58,75			57,15		5°	435
28	44,45	71,437	33,45	38,887					50,71				68,27			63,9		5,5°	668
32	50,8	80,962	38,23	44,45					61,98				77,83			76,2		5°	952

1) In use, this value is the permissible maximum.

Table 2 — Wide series — Dimensions, tolerances and masses

Dimensions in millimetres
Tolerances in micrometres

Diameter code	d	D	C +127 −127	B 0 −51	Δ_{dmp}	Δ_{ds}	Δ_{Dmp}	Δ_{Ds}	d_1 min.	r_1	r 0 −254	A max.	D_1 0 −203	P 0 −254	R	K ref.	β ±0,5°	α[1] min.	Mass ≈ g
03	4,826	15,875	8,31	11,1					7,62				14,3	0,635	0,127 to 0,254	13,462	20°	15°	14
04	6,35										0,508	0,762							
05	7,938	17,462	8,05						9,14				15,87			14,376		14°	16
06	9,525	20,638	10,31	12,7		0 −13		0 −13	11,84				18,08			17,348		8°	27
07	11,112	23,812	11,23	14,275					13,64			0,889	21,26	0,889		19,736		10°	36
08	12,7	25,4	12,83	15,875					15,42		0,762		22,86			22,123		9°	45
09	14,288	28,575	13,61	17,45					18,31	0,127 to 0,381			26,03			25,298		10°	61
10	15,875	30,162	14,4	19,05	0 −13		0 −13		18,97			1,016	27,6			26,899		12°	73
12	19,05	34,925	16	22,225					21,46				31,78		0,254 to 0,432	30,886	30°	13°	109
14	22,225	41,275	19,18						25,27				38,12			33,665		6°	159
16	25,4	53,975	25,53	34,925		+3 −15		+6 −19	32,23				50,82			47,523		12°	440
20	31,75	60,325	28,7	38,1					37,15		1,016	1,143	57,17	1,397		53,162		12,5°	500
24	38,1	68,262	31,06	42,85					45,5				66,1			62,5		13°	700
28	44,45	76,2	33,45	46,02					49,9				73,05			67,868			900
32	50,8	82,55	35,05	49,19					56,1				79,35			74,599		12,5°	1 050

1) In use, this value is the permissible maximum.

Table 3 — Narrow series — Loads

Diameter code	Permissible static load		Permissible dynamic radial load	Starting torque
	radial C_s kN	axial C_a kN	C_{25} kN	N·m
03	17,7	0,67	6,7	0,03 to 0,56
04	26,9	1,9	14,8	
05	38,9	3,1	24,3	0,03 to 0,9
06	46,9	4,9	29,4	
07	58,7	6,2	35,8	
08	79,6	9,3	46,3	
09	103,2	16,4	57,8	
10	135,7	21	73,2	
12	206,4	30	105	
14	278,4	41,6	134,6	0,03 to 1,35
16	365,6	54,1	169	
20	405	78	200,3	0,04 to 2
24	619,4	117,1	322,1	
28	816,6	164	418,2	0,06 to 2,7
32	1 123,1	218,2	575,2	

Table 4 — Wide series — Loads

Diameter code	Permissible static load		Permissible dynamic radial load	Starting torque
	radial C_s kN	axial C_a kN	C_{25} kN	N·m
03	40[1]	7,9	21,8	0,03 to 0,56
04				
05	41,8	7,3	26,9	0,03 to 0,9
06	60,9	11,7	37	
07	92,1	16,3	52,3	
08	95,2	22,1	66,5	
09	118,3	23,9	80,5	
10	129	27,3	90,1	
12	164,6	34,4	116,5	
14	290	48	149,4	0,03 to 1,35
16	609,4[1]	85,8	250,2	
20	568,4	115,9	295,5	0,04 to 2
24	706	137,7	367,1	
28	859,4	161,7	445,5	0,06 to 2,7
32	996,1	180	518	

1) The values reflect only bearing capability. Mounting hardware may restrictability to use full capacity.

Annex A

(informative)

Original characteristics

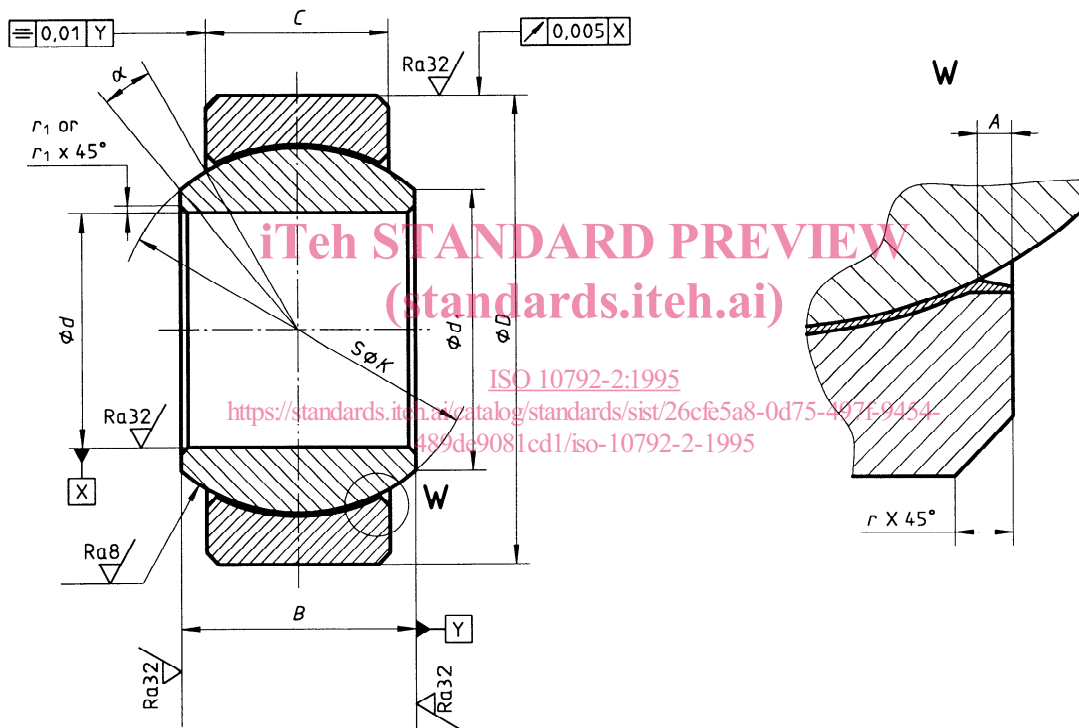Dimensions in inches
Surface roughness values in microinches

Figure A.1 — Spherical plain bearing with self-lubricating liner without face groove

Dimensions in inches
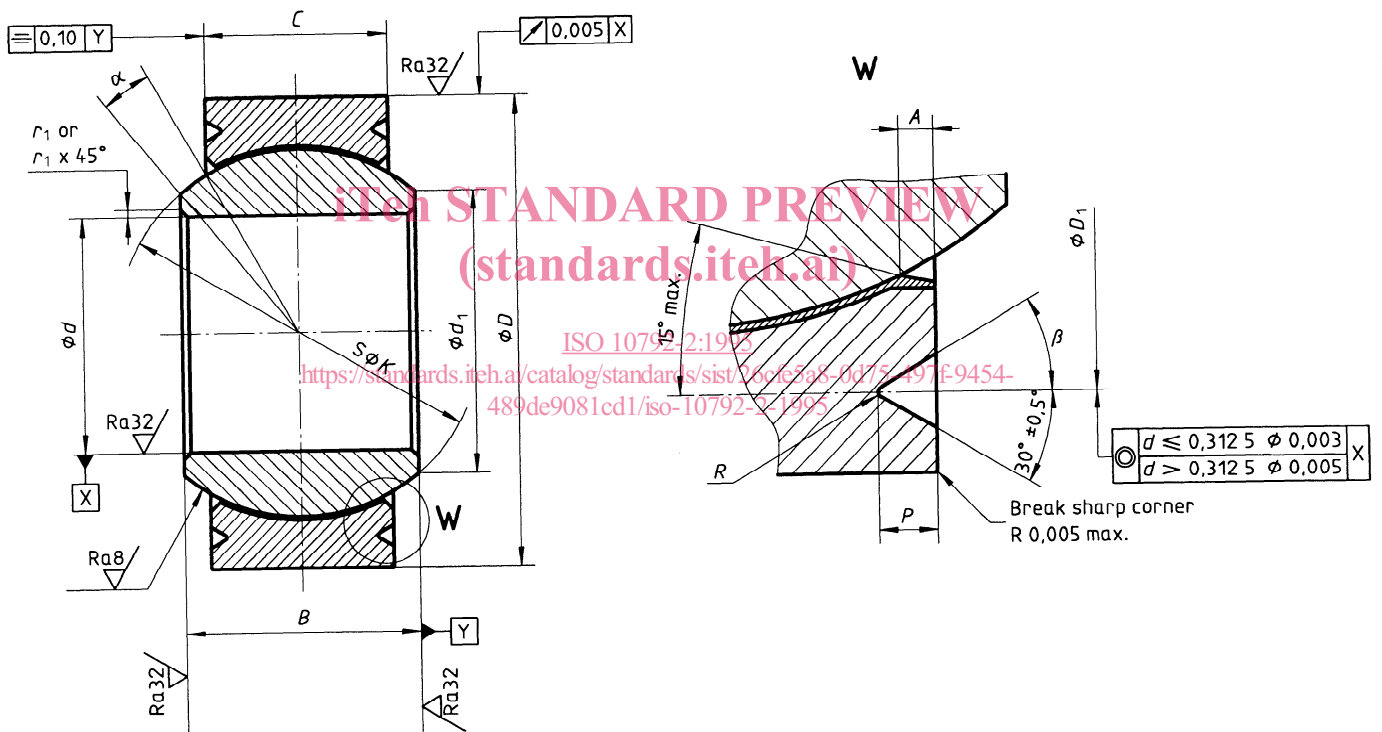Surface roughness values in microinches

Figure A.2 — Spherical plain bearing with self-lubricating liner with face groove