
Aerospace series - Rod ends, adjustable, self-aligning plain bearing with self-lubricating liner and threaded shank with engagement: 1,5 x thread diameter - Dimensions and loads

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Luft- und Raumfahrt - Einstellbare Ösenköpfe mit Gelenklager mit selbstschmierender Beschichtung und Gewindeschaft mit Einschraubtiefe von 1,5 Gewinde-Durchmesser - Maße und Belastungen

[SIST EN 2790:2001](https://standards.iteh.ai/catalog/standards/sist/c5aaddcb-31f9-4c99-ad6d-10b511100000/SIST-EN-2790-2001)

Série aérospatiale - Embouts réglables a rotule a garniture autolubrifiante et a tige filetée a implantation: 1,5 x le diametre de filetage - Dimensions et charges

Ta slovenski standard je istoveten z: EN 2790:1991

ICS:

49.035	Sestavni deli za letalsko in vesoljsko gradnjo	Components for aerospace construction
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SIST EN 2790:2001

en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 2790

UDC : 629.7.02 + 05 : 621.827.1 : 621.85.053.004.1 : 621.828 + 408.2.72

Key words : Aircraft industry, flight control, rod ends, swivel-end pieces, linings, self-lubricating parts, threaded shanks, dimensions, static loads

English version

Aerospace series
Rod ends, adjustable, self-aligning plain bearing
with self-lubricating liner
and threaded shank
with engagement : 1,5 x thread ϕ
Dimensions and loads

Série aéronautique
Embouts réglables à rotule
à garniture autolubrifiante
et à tige fileté
à implantation : 1,5 x ϕ filetage
Dimensions et charges

Luft- und Raumfahrt
Einstellbare Ösenköpfe mit Gelenklager
mit selbstschmierender Beschichtung
und Gewindeschaft
mit Einschraubtiefe von 1,5 x Gewinde - ϕ
Maße und Belastungen

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to CEN Central Secretariat has the same status as the official versions.

CEN members are the national standards organizations of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat : Rue de Stassart, 36, B-1050 Bruxelles

Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries and votes carried out in accordance with the rules of this Association, this Standard has successively received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

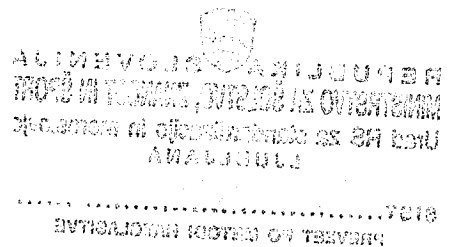
According to the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard :

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Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom

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1 Scope and field of application

This standard specifies the characteristics of adjustable rod ends consisting of :

- a self-aligning ball bearing with self-lubricating liner EN 2501 ;
- a rod end body with threaded shank comprising :
 - a circumferential groove to identify engagement ;
 - an optional longitudinal groove for locking purposes.

These rod ends are intended for use with flight control rods or rods for aircraft structures.

They are intended to be used within the temperature range : - 55 °C to + 150 °C.

2 References

ISO 1132	Rolling bearings - Tolerances - Definitions
ISO 3353	Aerospace construction - Rolled threads - Runout and lead threads
ISO 5855/2	Aerospace - MJ Threads - Part 2 : Limit dimensions for bolts and nuts
EN 2064	Aerospace series - Bearings, spherical plain in corrosion resisting steel with self-lubricating liners - Technical specification 1)
EN 2068	Aerospace series - Rod ends with self-lubricating, self-aligning bearings - Technical specification 2)
EN 2133	Cadmium plating of steels with maximum specified tensile strength equal to or less than 1450 MPa, and copper and copper alloys - Aerospace series 1)
EN 2137	Steel FE-PL75 - $1100 \text{ MPa} \leq R_m \leq 1250 \text{ MPa}$ - Bars $D_e \leq 100 \text{ mm}$ - Aerospace series 1)
EN 2475	Steel FE-PL74 - $1100 \text{ MPa} \leq R_m \leq 1300 \text{ MPa}$ - Bars $D_e \leq 100 \text{ mm}$ - Aerospace series 1)
EN 2476	Steel FE-PL74 - $1100 \text{ MPa} \leq R_m \leq 1300 \text{ MPa}$ - Forgings $D_e \leq 100 \text{ mm}$ - Aerospace series 1)
EN 2498	Aerospace series - Rod ends adjustable self-aligning plain bearing with self-lubricating liner and threaded shank - Dimensions and loads
EN 2501	Aerospace series - Bearings, spherical plain in corrosion resisting steel with self-lubricating liner and wide inner ring - Dimensions and loads.

3 Symbols

Δ_{ds}	=	deviation of a single bore diameter 3)
Δ_{dmp}	=	single plane mean bore diameter deviation 3)
α	=	maximum displacement angle which can be formed by the outer ring with the inner ring, the spherical surface of the outer ring being fully in contact with that of the inner ring
C_{25}	=	permissible dynamic radial load by 25 000 cycles (for definition see EN 2064).

1) Published as AECMA standard at the date of publication of the present standard.

2) Published as AECMA prestandard at the date of publication of the present standard.

3) For definition of tolerances see ISO 1132.

4 Required characteristics

4.1 Dimensions - Tolerances - Masses

Configuration : see figure.

Dimensions, tolerances and masses : see figure and tables 1 and 2, values after cadmium plating.

4.2 Surface roughness

See figure, values prior to cadmium plating.

4.3 Loads and rotational starting torques

See table 2.

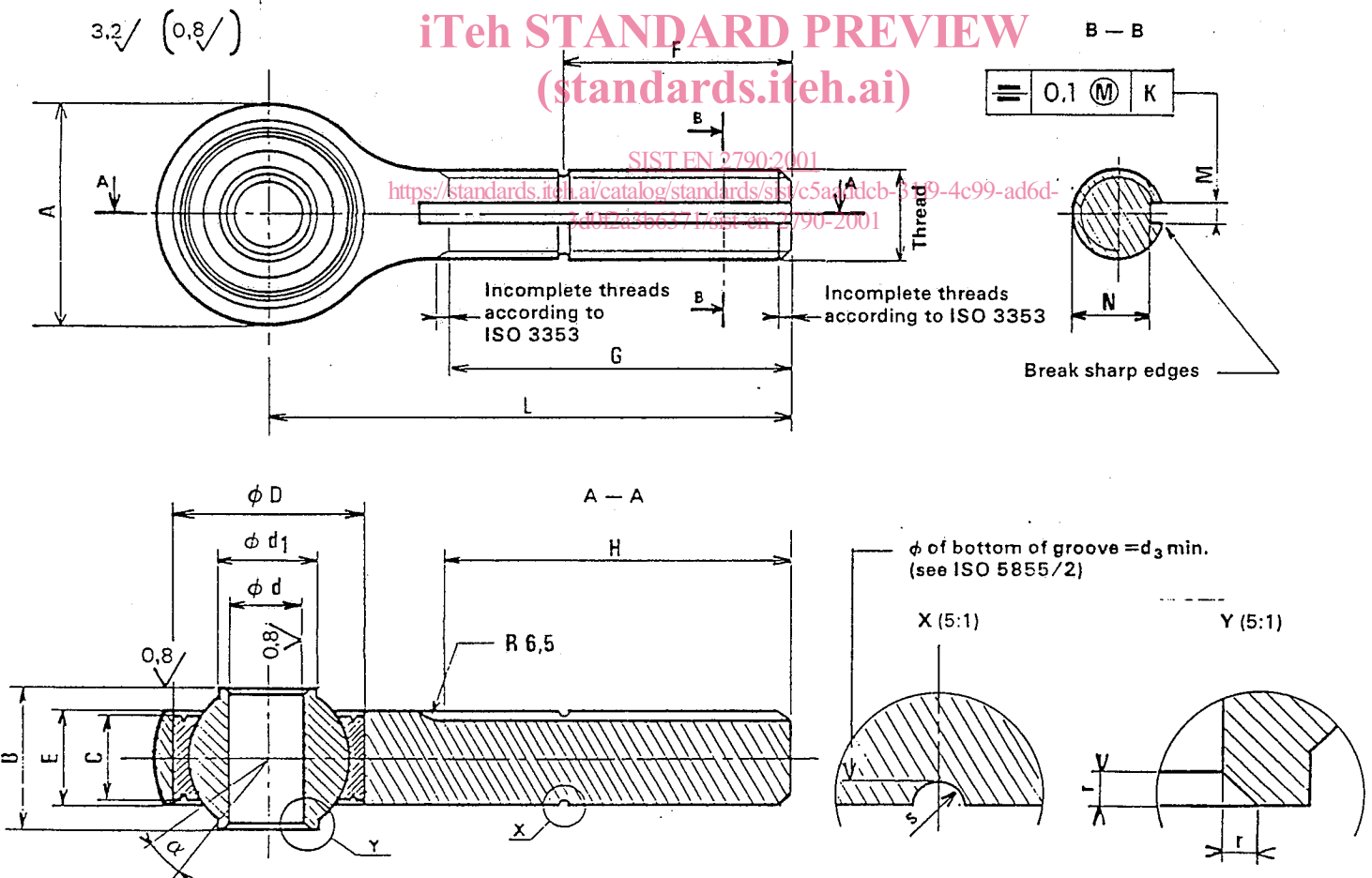
4.4 Materials

Rod end body : Steel EN 2137 or EN 2475 or EN 2476 - Hardness $33 \leq \text{HRC} \leq 39$.

Plain bearing : See EN 2501.

4.5 Surface treatment

Rod end body : Cadmium plating EN 2133, $7 \mu\text{m}$ to $20 \mu\text{m}$ except threads $5 \mu\text{m}$ to $10 \mu\text{m}$, chromate passivation optional.



NOTE 1 : The circumferential groove and the longitudinal groove over the distance F shall be painted red.

NOTE 2 : The swaging of the bearing in the rod end body is at the manufacturer's option.

Figure

Table 1

Dimensions in millimetres

Code	Nominal diameter	d		Thread 1) designation	F 2) min.	G 3) min.	H +0,5 -1	L ±0,5	M +0,1 0	N 0 -0,1	S	Mass ≈ g	Reference to be used for the designation
		A +0,2 0	E +0,1 0										
06	6	22,5	8,2	MJ 10 × 1,25 - 4h6h	23	37	37	54	2,4	8,0	0,8	46	EN 2790
08	8	26,0	10,2	MJ 12 × 1,25 - 4h6h	27	42	42	62		10,2		76	
10	10	32,0	13,2	MJ 14 × 1,5 - 4h6h	31	48	48	73	3,2	12,2	1,0	135	EN 2498 4)

- 1) According to ISO 5855 - Part 2 ; manufacturing method : rolled.
- 2) F is also the minimum length of engaged thread, it includes thickness of lock washer and height of nut.
- 3) G = minimal length of useful thread.
- 4) The reference EN 2790 has been used in the pre-standard.

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Table 2

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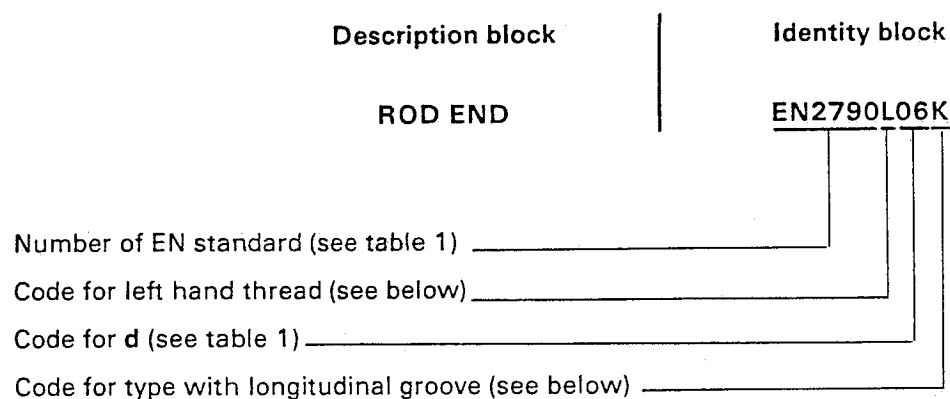
Dimensions in millimetres

After swaging of the plain bearing in the rod end body				Spherical plain bearings with self-lubricating liner EN 2501 (Reference only)								
Permissible dynamic radial load 1) C ₂₅ kN	Axial push out load kN	Starting torque N.m	Ultimate static load 3) kN	B 0 -0,06	C +0,1 0	D 4)	d		d ₁ min.	r	α degrees	
							Nom.	Tolerances μm				
								Δ _{dmp}				Δ _{ds}
16,6	4,5	0,45 to 1,30	27	14	8	18	6		9,0	0,3 to 0,8	9	
25,2	6,5	0,70 to 2,00	39	15	10	21	8	0 -8	+ 2 -10		11,0	8
38,6 2)	10,5		58	20	13	26	10				13,5	10

- 1) Along the axis of the rod end.
- 2) This load is equal to the 2/3 ultimate static load of the rod end and not to the load from EN 2501.
- 3) Ultimate loads are given because failure may occur in the rod end and not in the bearing. Users shall apply their own factors to obtain the permissible static load.
- 4) The relevant fit is at the manufacturer's option.

5 Designation

Each rod end shall only be designated as in the following example :



Where the following codes are applied :

- L = left hand thread
- R = right hand thread
- K = with groove
- T = without groove

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NOTE : If necessary, the originator's code 19005 may be introduced between the description block and the identity block.

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6 Marking

In addition to the manufacturer's own marking, each rod end and its packaging shall be marked using the identity block specified in clause 5.

The position and method of marking are at the manufacturer's option, it shall not have any detrimental effect on the rod end.

7 Technical specification

See EN 2068.