1. PRODUCT DESCRIPTION

Ball joints are mechanical units for the connection of 2 parts which are perpendicular with respect to each o her. They enable the transmission of alternating forces through angular and oscillating movements, at a moderate speed.

They are standard products which are produced according to the following standards:

DIN 71802

Ball joints:

a) Form C: without safety clip S and therefore without its external slot and the two holes for the clip itself

b) Form CS: with safety clip S mounted in the slot and the two holes of the housing.

Available with or without nut (mounted or separated)

DIN 71805

Ball Socket

a) Form A: without slot and holes for the safety clip and with the mounted snap ring R

b) Form B: with external slot and holes for the safety clip S and with the internal snap ring R

DIN 71803

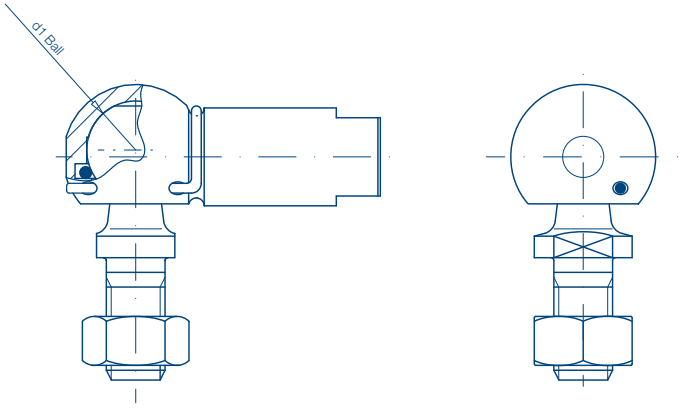
Ball Stud

a) Form C: with thread

b) Form B: without hread, to rivet

The ball sockets DIN 71805 produced and supplied by Chiavette Unficate have been improved by he spanner's execution. Upon request, they could be also supplied wi hout spanner surface

All our products could be supplied with electrolytic coatings according to the standards stated at page 6 and/ or unfinished .



2. TECHNICAL DATA

MATERIALS

Ball stud: carbon steel with 60 daN/mm² resistance to tensile stress and inner ring hardened on the surface with hardness ≥ 52 HRC in alternative (1.4305 - AISI 303)

Ball socket: steel 11SMnPb30 with a 50 daN/mm² resistance to tensile stress (1.0718) in alternative (1.4305 - AISI 303)

Springs: steel for springs C98 UNI EN 10270-1 DH in alternative (1.4319 - AISI 302)

Lubrification: spherical coupling o led during assembly with LITHIUM grease, NLGI 1 grade

Nuts: see table at page 67

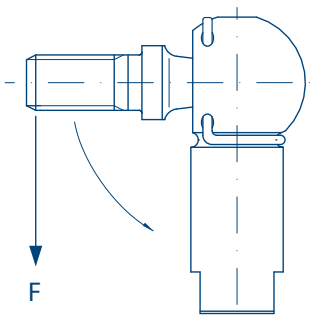
Extraction and Insertion force BALL STUD - BALL SOCKET

The load values requested for the extraction and insertion of the ball stud from/to the ball socket's housing with the mounted "R" spring, with the joint free from grease, are indicated in the following table:

d1 (ball stud inner ring diameter)	8	10	13	16	19
Extraction force [daN] min	3	4	6	8	10
Insertion force [daN] max	20	25	32	35	40

Sliding moment

In the male-female coupling (with grease), the male in a horizontal position falls with a force F applied to the extremity of the male thread (see diagram), according to the table below:



DESIGNATION	max. force (daN)
C 8 M5	0,4
CS 8 M5	0,4
C 10 M6	0,5
CS 10 M6	0,5
C 13 M8	0,6
CS 13 M8	0,6
C 16 M10 - M12	0,7
CS 16 M10 - M12	0,7
C 19 M14 - M16	0,8
CS 19 M14 - M16	0,8

Permissible load and tightening torque

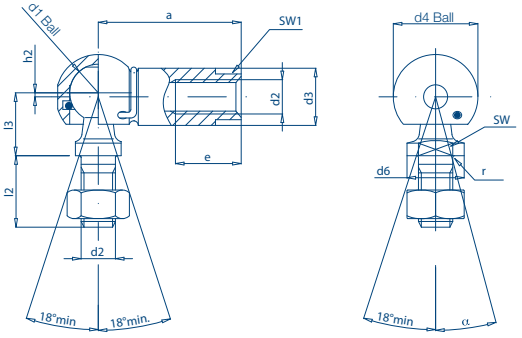
The maximum permissible load for the angular joint is given in the following table; it is also important to tighten the nut as indicated:

DESIGNATION	Permissible load [daN]		Nut tightening torque (daN·m)
	static	dynamic	
C 8 M5	50	20	0,35
CS 8 M5	50	20	0,35
C 10 M6	100	40	0,74
CS 10 M6	100	40	0,74
C 13 M8	200	80	1,80
CS 13 M8	200	80	1,80
C 16 M10	400	160	3,50
CS 16 M10	400	160	3,50
C 16 M12	400	160	4,20
CS 16 M12	400	160	4,20
C 19 M14	800	320	7,00
CS 19 M14	800	320	7,00
C 19 M16	800	320	8,00
CS 19 M16	800	320	8,00

Form
CS

DIN 71802 form CS





Dimensions mm

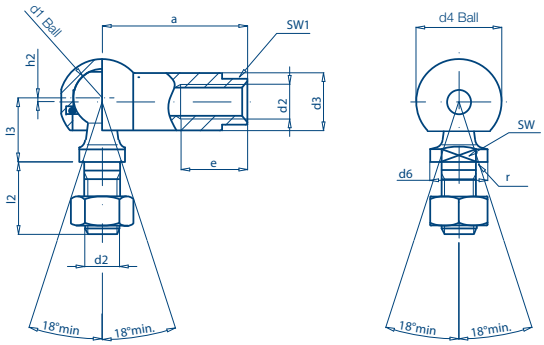
DESIGNATION	d1	d2 6g/6H**	a ±0,3	d3 ±0,5	d4 ±0,5	d6 h14	e min.	h2 ±0,5	l2 ±0,3	l3 ±0,3	r max.	*sw h14	*sw1 h14	α° ≈	weight ≈ (kg)
CS 8 M5	8	M5	22	8	12,8	8	10,2	0,65	10,2	9	0,3	7	7	10	0,015
CS10 M6	10	M6	25	10	14,8	10	11,5	0,7	12,5	11	0,3	8	8	15	0,025
CS13 M8	13	M8	30	13	19,3	13	14	1,15	16,5	13	0,5	11	11	15	0,053
CS16 M10	16	M10	35	16	24	16	15,5	1,15	20	16	0,5	13	13	15	0,104
CS16 M12	16	M12	35	16	24	16	15,5	1,15	20	16	0,5	13	-	15	0,150
CS19 M14x1,5	19	M14x1,5	45	22	30	19	21,5	0,5	28	20	0,8	16	-	15	0,221
CS19 M14x2	19	M14	45	22	30	19	21,5	0,5	28	20	0,8	16	-	15	0,221
CS19 M16	19	M16	45	22	30	19	21,5	0,5	28	20	0,8	16	-	15	0,221

**spanner flats*
***tolerances d2: ball stud 6g-threaded hole 6H*

Form
C

DIN 71802 form C





Dimensions mm

DESIGNATION	d1	d2 6g/6H**	a ±0,3	d3 ±0,5	d4 ±0,5	d6 h14	e min.	h2 ±0,5	l2 ±0,3	l3 ±0,3	r max.	*sw h14	*sw1 h14	weight ≈ (kg)
C 8 M5	8	M5	22	8	12,8	8	10,2	0,65	10,2	9	0,3	7	7	0,015
C10 M6	10	M6	25	10	14,8	10	11,5	0,7	12,5	11	0,3	8	8	0,025
C13 M8	13	M8	30	13	19,3	13	14	1,15	16,5	13	0,5	11	11	0,053
C16 M10	16	M10	35	16	24	16	15,5	1,15	20	16	0,5	13	13	0,104
C16 M12	16	M12	35	16	24	16	15,5	1,15	20	16	0,5	13	-	0,150
C19 M14x1,5	19	M14x1,5	45	22	30	19	21,5	0,5	28	20	0,8	16	-	0,221
C19 M14x2	19	M14	45	22	30	19	21,5	0,5	28	20	0,8	16	-	0,221
C19 M16	19	M16	45	22	30	19	21,5	0,5	28	20	0,8	16	-	0,221

**spanner flats*
***tolerances d2: ball stud 6g-threaded hole 6H*

For left-hand thread add "LH" (ex. CS 16 M10 LH o C13 M8 LH)
Technical reading from page 68 to page 69

MATERIALS

Ball stud: *carbon steel with 60 daN/mm² resistance to tensile stress and inner ring hardened on the surface with a ≥ 52 HRC hardness*
Ball socket: *steel 11SMnPb30 with a 50 daN/mm² resistance to tensile stress (1.0718)*
Internal snap ring "R": *steel for springs C98 UNI EN 10270-1 DH*
Safety clip"S": *steel for springs C98 UNI EN 10270-1 DH*

Surface protection:

- *Zinc plating according to EN ISO 4042, Fe/Zn 8c...*
- *Chromate treatment (passivation) example: type A please add 1A (ex.:CS 10 M6 1A)*
- *Surface treatment table at page 6*

Tolerances:

The dimensional tolerances shown in the table make reference to zinc plated products.