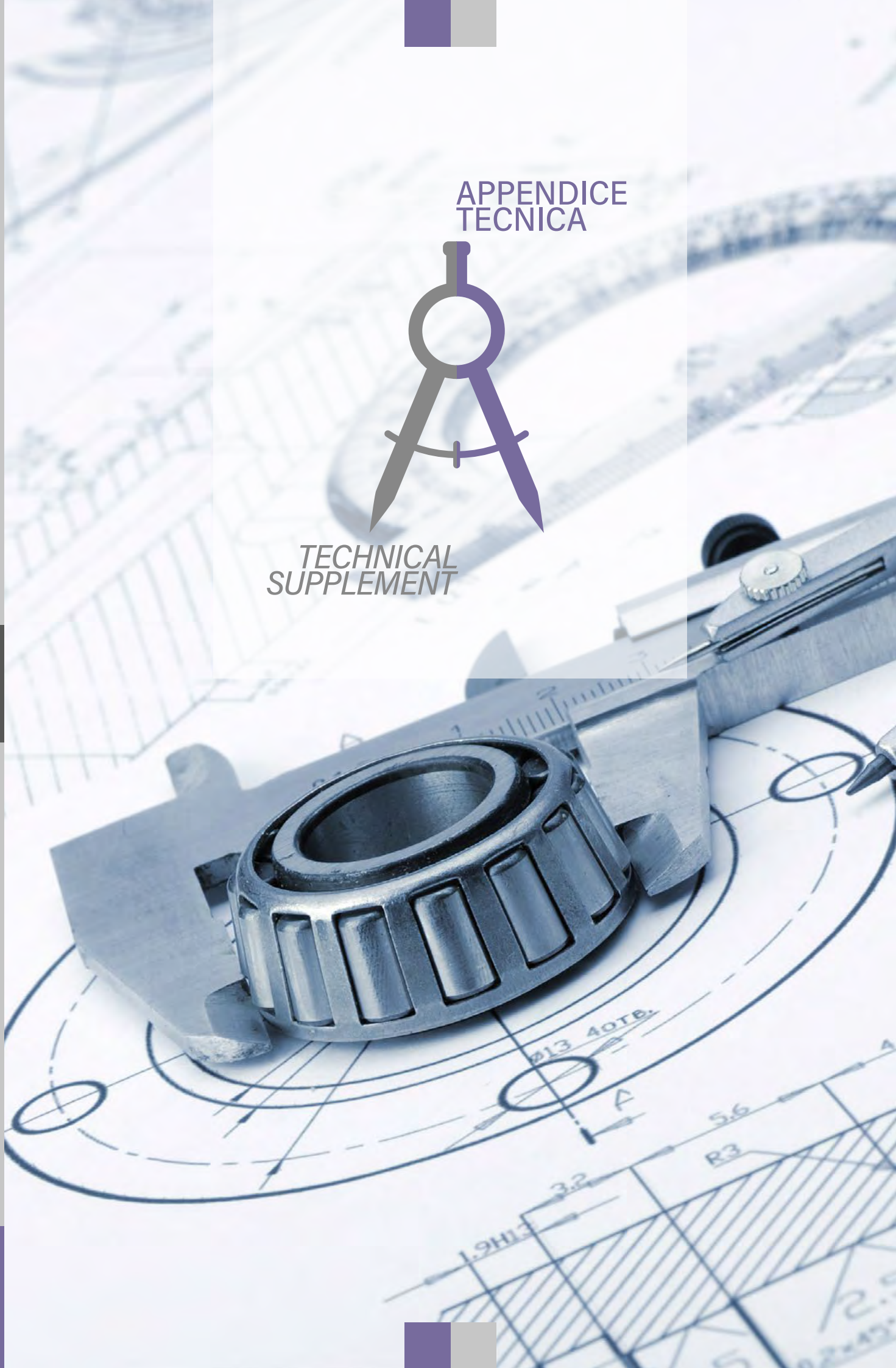
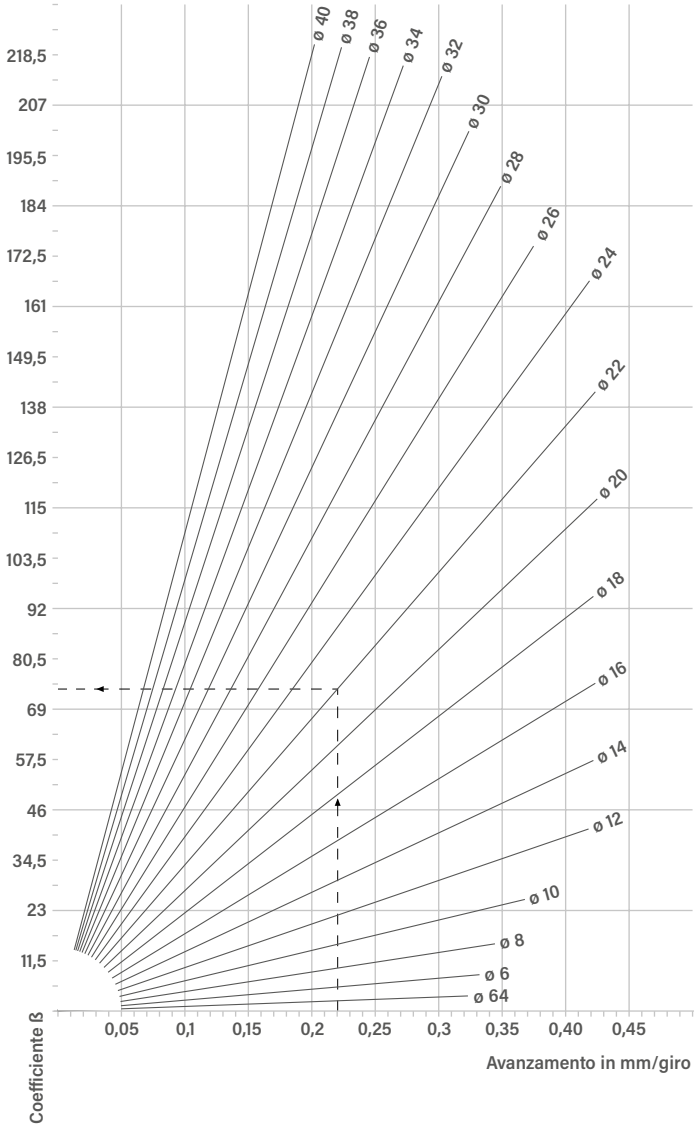
APPENDICE TECNICA

TECHNICAL SUPPLEMENT




0.5x45°
0.01MM

CALCOLO MOMENTO TORCENTE E POTENZA
ESTIMATE TORQUE AND POWER



La OMG, con questo diagramma, desidera offrire la possibilità di calcolare con velocità e ottima approssimazione, il momento torcente e la relativa potenza necessaria per l'esecuzione delle forature. Scegliendo l'appropiato avanzamento sull'ascissa, congiungendo con il relativo diametro di foratura, in ordinata si leggerà un determinato valore del "coefficente ß"; moltiplicando questo per la resistenza del materiale si otterrà il momento torcente. Applicando poi la formula

$$N = \frac{M_t \times n}{9549,3}$$

dove n è il n° di giri, si otterrà la potenza N espressa in kW

With this diagram, OMG makes it possible to calculate the torque and corresponding power necessary for drilling quickly and with maximum approximation. By selecting the proper feed on the abscissa and adding it to the corresponding drilling diameter on the ordinate, a certain «coefficient ß» value is obtained. By multiplying this by the material strength, the torque can be found. Then, by applying the formula,

$$N = \frac{M_t \times n}{9549,3}$$

where n is the number of revolutions, it is possible to determine power N expressed in kW.

Es:

a = 0,22 mm/giro
punta Ø 22
giri/1' = 230
R = 500 N/mm²
coefficiente ß = 73

$$M_t = \frac{73 \times 500}{1000} = 36,5 \text{ Nm}$$

$$N = \frac{36,5 \times 230}{9549,3} = 0,88 \text{ kW}$$

Ex:

a = 0,22 mm/revs
tip Ø 22
rpm = 230
R = 500 N/mm²
coefficient ß = 73

Dimensioni estremità mandrini macchine utensili per la costruzione del manicotto di collegamento.

Spindles dimensions off machine-tools to manufacture the connection collar.

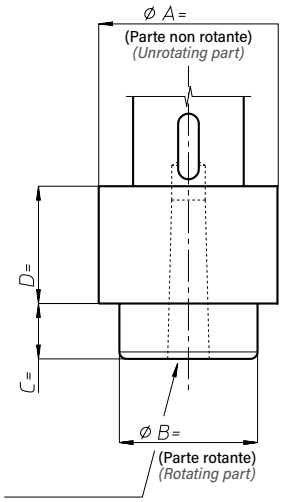


Fig. 1

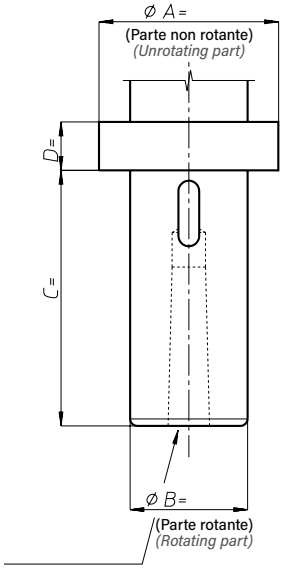


Fig. 2

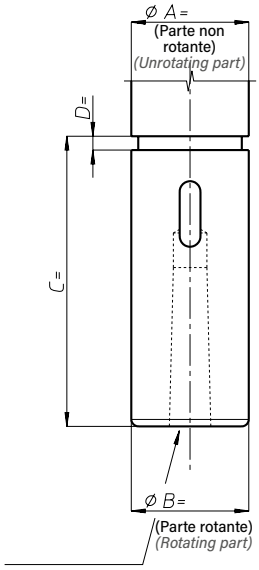


Fig. 3

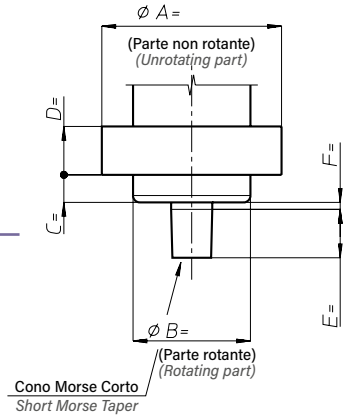


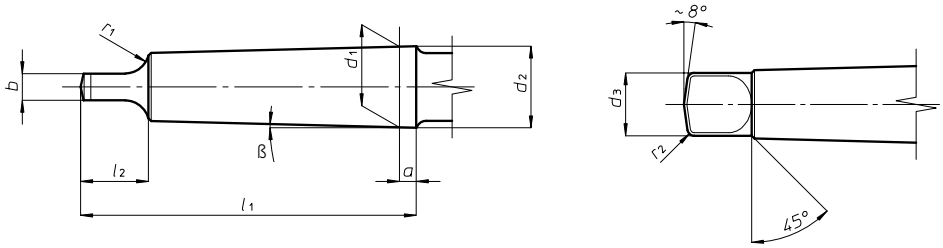
Fig. 4

Se nessuna figura si adatta alla vostra macchina, disegnate qui l'estremità mandrino.

If no picture fits your machine, draw here the spindle end.

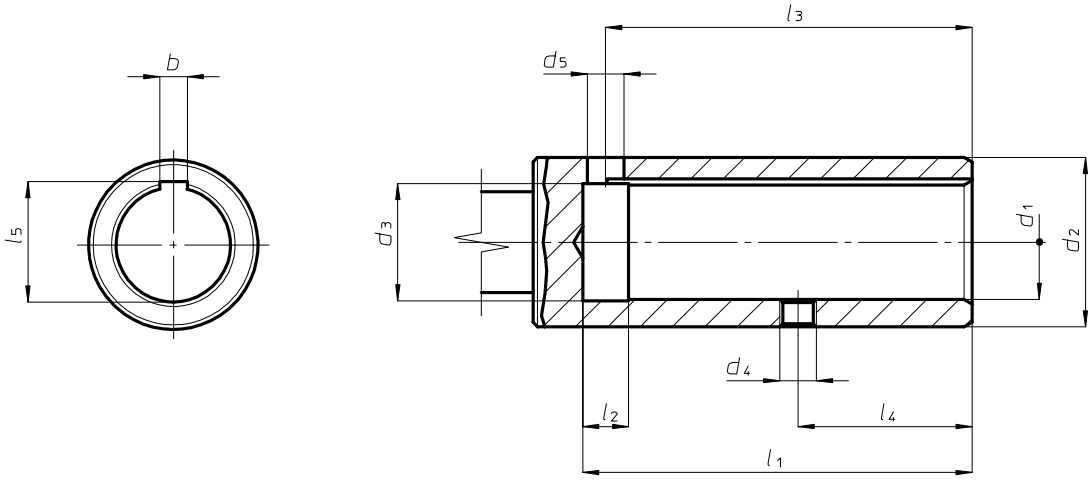
DIN 228

CONO MORSE · *MORSE TAPER*

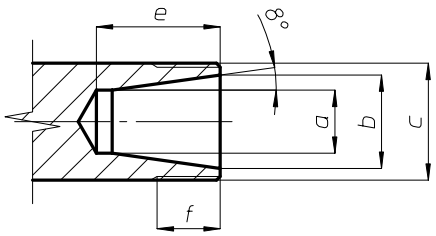


Cono Morse *Morse Taper*	a	b h13	d1	d2	d3max	l1max	l2max	r1	r2	ß
0	3	3,9	9,045	9,2	6	59,5	10,5	4	1	1°29'27"
1	3,5	5,2	12,065	12,2	8,7	65,5	13,5	5	1,2	1°25'43"
2	5	6,3	17,780	18	13,5	80	16	6	1,6	1°25'50"
3	5	7,9	23,825	24,1	18,5	99	20	7	2	1°26'16"
4	6,5	11,9	31,267	31,6	24,5	124	24	8	2,5	1°29'15"
5	6,5	15,9	44,399	44,7	35,7	156	29	10	3	1°30'26"
6	8	19	63,348	63,8	51	218	40	13	4	1°29'36"

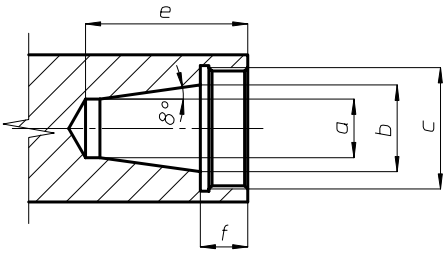
DIN 5058



Grandezza *Size d1 H7*	Ø8	Ø10	12	16	Ø20	Ø25	28	Ø32	Ø36	48
b	2	3	3	5	5	6	6	8	9	10
d2f7	15	18	20	25	32	37	40	45	50	67
d3	8,6	10,6	12,6	16,6	20,6	25,6	28,6	32,8	36,8	48,8
d4	M4	M5	M5	M6	M6	M8	M8	M8	M8	M10
d5	3,5	5	5	6	6	8	8	10	10	12
l1 min	42	52	52	75	78	85	85	106	106	129
l2	8	8	8	8	8	10	10	10	10	12
l3	35	48	48	70	73	80	80	101	101	123
l4 ±0,1	16	22	22	34	34	38	38	45	45	57
l5 ±0,1	9	11,1	13,1	17,3	21,3	26,7	29,7	33,7	37,7	50,1



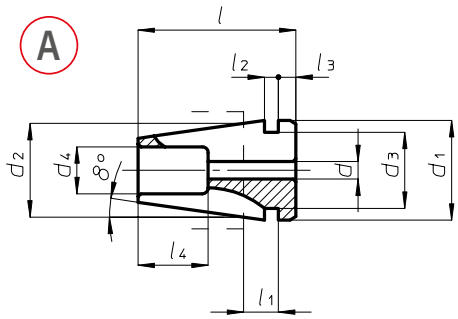
Grandezza *Size d1 H7*	Serraggio *Clamping*	a	b ±0,05	c	e	f	
ER8	0,5... 5,0	5,2	8	M10x0,75	13,0	7,5	
ER11	0,5... 7,0	7,5	11	M13x0,75	17,0	10,0	
ER16	0,5... 10,0	10,5	16	M19x1,00	22,0	13,0	
ER20	0,5... 13,0	13,5	20	M24x1,00	26,5	13,5	
ER25	0,5... 16,0	18,0	25	M30x1,00	29,0	14,0	
ER16	0,5... 10,0	10,5	16	M22x1,50	22,0	13,0	
ER20	0,5... 13,0	13,5	20	M25x1,50	26,5	13,5	
ER25	0,5... 16,0	18,0	25	M32x1,50	29,0	14,0	
ER32	1,0... 20,0	23,5	32	M40x1,50	34,0	16,0	
ER40	2,0... 30,0	30,5	40	M50x1,50	38,0	17,0	
ER50	4,0... 34,0	38,0	50	M64x2,00	48,0	24,0	

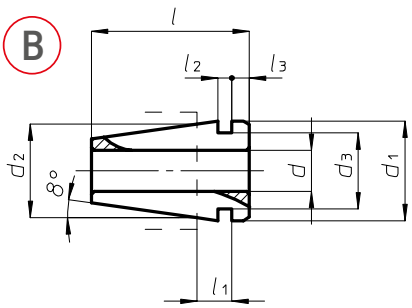


Grandezza *Size d1 H7*	Serraggio *Clamping*	a	b ±0,05	c	e	f	
ER11	0,5... 7,0	7,5	11	M18x1,00	23,0	7,0	
ER16	0,5... 10,0	10,5	16	M24x1,00	32,0	10,0	
ER20	0,5... 13,0	13,5	20	M28x1,50	37,5	11,0	
ER25	0,5... 16,0	18,0	25	M32x1,50	41,0	12,0	
ER32	1,0... 20,0	23,5	32	M40x1,50	48,0	14,0	

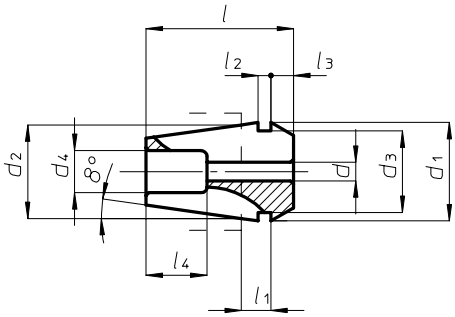
DIN 6499-B

PINZE · *COLLETS*

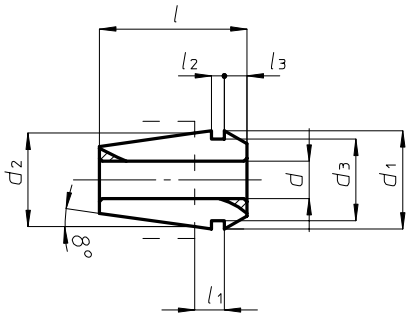




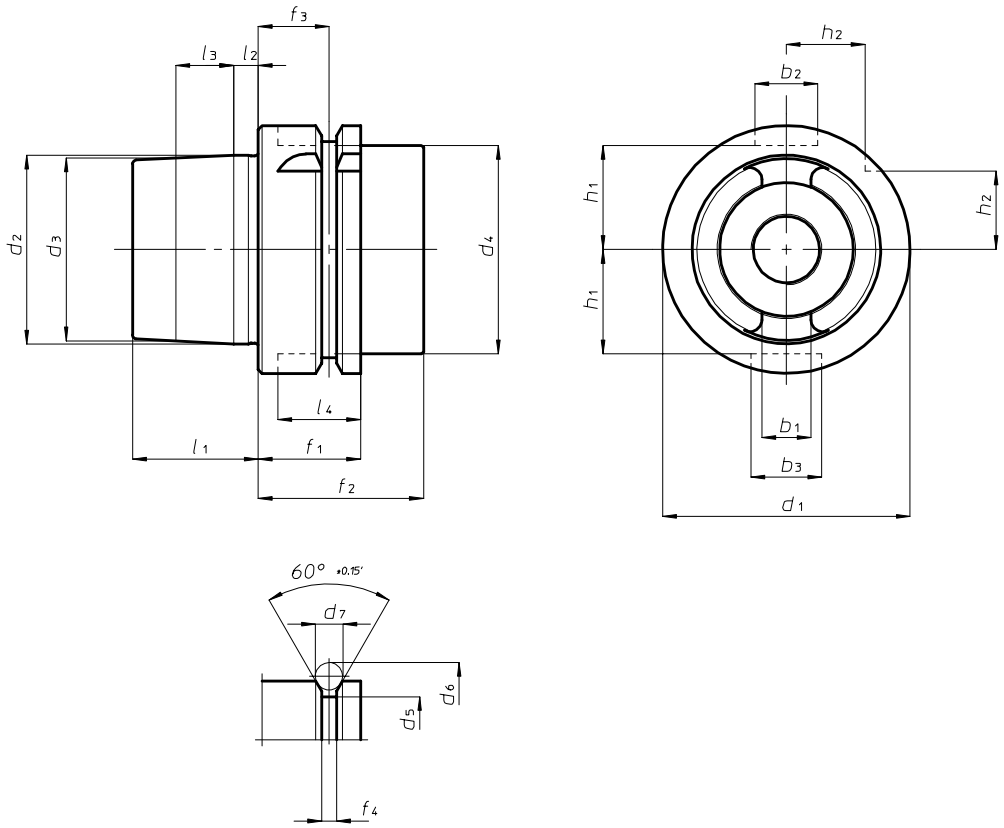
Grandezza *Size d1 H7*	d	d1	d2	d3	d4	l	l1	l2	l3	l4	Disegno *Picture*
ER8	0,5... 2,5	8,5	8,0	6,5	4,0	13,5	2,98	1,2	1,5	6,0	A
ER8	3,0... 5,0	8,5	8,0	6,5	-	13,5	2,98	1,2	1,5	-	A



Grandezza *Size d1 H7*	d	d1	d2	d3	d4	l	l1	l2	l3	l4	
ER11	0,5... 2,5	11,5	11,0	9,5	5,0	18,0	3,80	2,0	2,5	9,0	
ER16	0,5... 4,5	17,0	16,0	13,8	7,5	27,5	6,26	2,7	4,0	10,0	
ER20	1,0... 6,5	21,0	20,0	17,4	9,0	31,5	6,36	2,8	4,8	13,0	
ER25	1,0... 7,5	26,0	25,0	22,0	12,0	34,0	6,66	3,1	5,0	15,0	
ER32	2,0... 3,5	33,0	32,0	29,2	15,0	40,0	7,16	3,6	5,5	20,0	
ER32	4,0... 7,5	33,0	32,0	29,2	15,0	40,0	7,16	3,6	5,5	15,0	
ER40	3,0... 3,5	41,0	40,0	36,2	20,0	46,0	7,66	4,1	7,0	21,0	
ER40	4,0... 8,5	41,0	40,0	36,2	20,0	46,0	7,66	4,1	7,0	18,0	
ER50	4,0... 10,0	52,0	50,0	46,0	20,0	60,0	12,60	5,5	8,5	26,0	



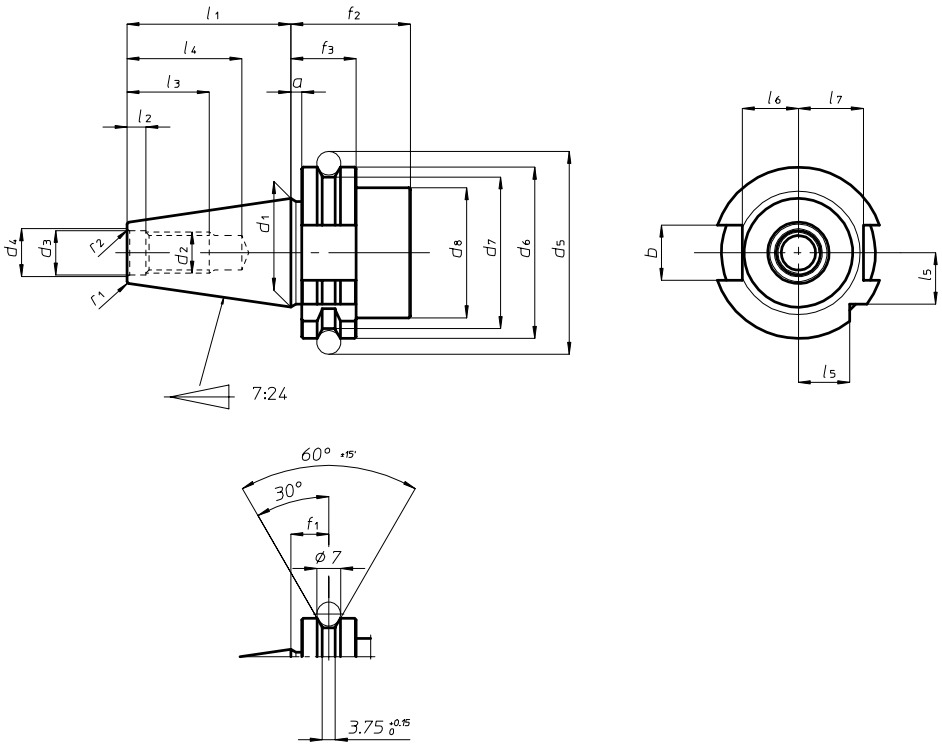
Grandezza *Size d1 H7*	d	d1	d2	d3		l	l1	l2	l3		
ER11	3,0... 7,0	11,5	11,0	9,5		18,0	3,80	2,0	2,5		
ER16	5,0... 10,0	17,0	16,0	13,8		27,5	6,26	2,7	4,0		
ER20	7,0... 13,0	21,0	20,0	17,4		31,5	6,36	2,8	4,8		
ER25	8,0... 16,0	26,0	25,0	22,0		34,0	6,66	3,1	5,0		
ER32	8,0... 20,0	33,0	32,0	29,2		40,0	7,16	3,6	5,5		
ER40	9,0... 30,0	41,0	40,0	36,2		46,0	7,66	4,1	7,0		
ER50	12,0... 34,0	52,0	50,0	46,0		60,0	12,60	5,5	8,5		



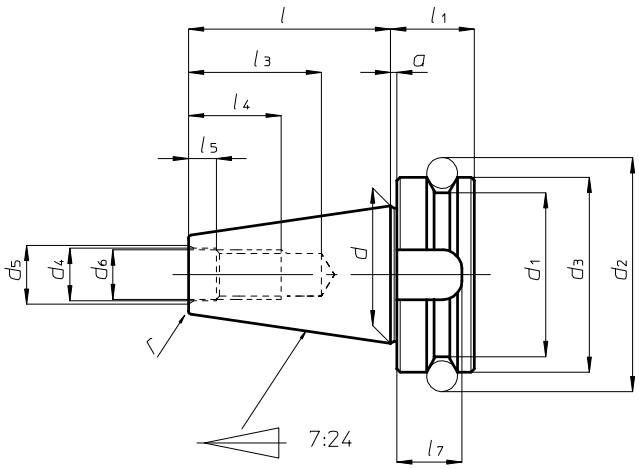
	HSK50		HSK63		HSK80		HSK100	
b1 H10	10,5		12,5		16		20	
b2 H10	12		16		18		20	
b3 H10	14		18		20		22	
d1 H10	50		63		80		100	
d2	38	+0,009 +0,006	48	+0,011 +0,007	60	+0,013 +0,008	75	+0,015 +0,009
d3	36,900	+0,006 +0,003	46,530	+0,007 +0,003	58,100	+0,008 +0,003	72,600	+0,009 +0,003
d4 max	42		53		67		85	
d5 $^{0}_{-0,1}$	43		55		70		92	
d6 $^{0}_{-0,1}$	59,3		72,3		88,8		109,75	
d7	7		7		7		7	
f1 $^{0}_{-0,1}$	26		26		26		29	
f2 min	42		42		42		45	
f3 ±0,1	18		18		18		20	
f4 $^{+0,15}_{0}$	3,75		3,75		3,75		3,75	
h1 $^{0}_{-0,2}$	21		26,5		34		44	
h2 $^{0}_{-0,3}$	15,5		20		25		31,5	
l1 $^{0}_{-0,2}$	25		32		40		50	
l2	5		6,3		8		10	
l3	11		14,7		19		24	
l4	19		21		22		24	

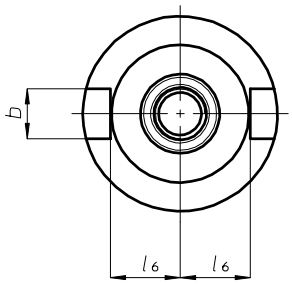
DIN 6981

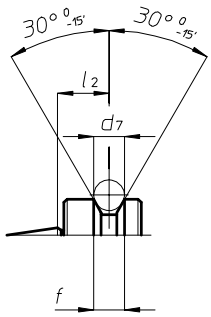
FORMA A · *A SHAPE*



Grandezza *Size d1 H7*	30	40	45	50
a $^{+0,1}_{-0,1}$	32	3,2	3,2	3,2
b H12	16,1	16,1	19,3	25,7
d1	31,75	44,45	57,15	69,85
d2	M12	M16	M20	M24
d3 H7	13	17	21	25
d4 max	14	19	23,4	28
d5 $^{+0,05}_{-0,05}$	59,3	72,3	91,35	107,25
d6 $^{0}_{-0,1}$	50	63,55	82,55	97,50
d7 $^{0}_{-0,5}$	44,3	56,25	75,25	91,25
d8 max	45	50	63	80
f1 $^{+0,1}_{-0,1}$	11,1	11,1	11,1	11,1
f2 min	35	35	35	35
f3 $^{0}_{-0,1}$	19,1	19,1	19,1	19,1
l1 $^{0}_{-0,3}$	47,8	68,4	82,7	101,75
l2 $^{+0,5}_{0}$	5,5	8,2	10	11,5
l3 min	24	32	40	47
l4 min	33,5	42,5	52,5	61,5
l5 $^{0}_{-0,3}$	15	18,5	24	30
l6 $^{0}_{-0,4}$	16,4	22,8	29,1	35,5
l7 $^{0}_{-0,4}$	19	25	31,3	37,7
r1	0,6 $^{0}_{-0,3}$	1,2 $^{0}_{-0,5}$	2 $^{0}_{-0,5}$	2,5 $^{0}_{-0,5}$
r2 $^{0}_{-0,5}$	0,8	1	1,2	1,5

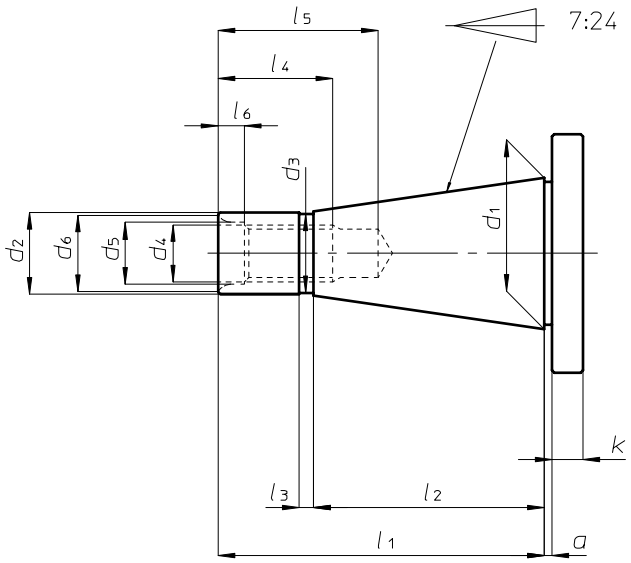


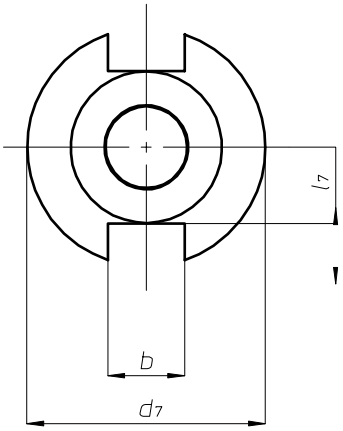




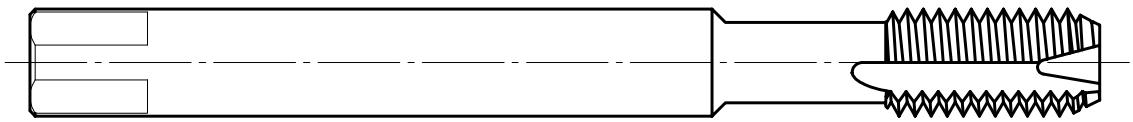
Grandezza *Size d1 H7*	30	40	50
a ±0,4	2	2	3
b H8	16,1	16,1	25,7
d	31,75	44,45	69,85
d1 - 0,1 - 0,3	38	53	85
d2	56,144	74,679	119,019
d3 H8	46	63	100
d4 H8	12,5	17	25
d5	14,5	19	27
d6	M12	M16	M24
d7	8	10	15
f + 0,1 0	8	10	15
l ±0,15	48,4	65,4	101,8
l1	22	27	38
l2 ±0,1	13,6	16,6	23,2
l3	34	43	62
l4	24	30	45
l5 + 0,5 0	7	9	13
l6 0 - 0,2	16,3	22,6	35,4
l7	17	21	31
r	0,5	1	1

DIN 2080





Grandezza *Size*	30	40	45	50
a ±0,2	1,6	1,6	3,2	3,2
b H12	16,1	16,1	19,3	25,7
d1	31,75	44,45	57,15	69,85
d2 a 10	17,4	25,3	32,4	39,6
d3	16,5	24	30	38
d4	M12	M16	M20	M24
d5	13	17	21	26
d6 max	16	21,5	26	32
d7 $^{0}_{-0,4}$	50	63	80	97,5
k ±0,15	8	10	12	12
l1	68,4	93,4	106,8	126,8
l2	48,4	65,4	82,8	101,8
l3	3	5	6	8
l4	24	32	40	47
l5 min	33,5	42,5	52,5	61,5
l6 $^{+0,5}_{0}$	5,5	8,2	10	11,5
l7 max	16,2	22,5	29	35,3



Maschi *Clamping*		ISO 529		DIN 371 (DIN 2181)		DIN 371		DIN 376		JAPAN JIS		US STANDARD	
(mm)	(pollici)	(Ø)	(□)	(Ø)	(□)	(Ø)	(□)	(Ø)	(□)	(Ø)	(□)	(Ø)"	(□)"
M1.0		2,50	2,10	-	-	2,50	2,10	-	-	3,00	2,50	-	-
M1.1		2,50	2,10	-	-	2,50	2,10	-	-	3,00	2,50	-	-
M1.2		2,50	2,10	-	-	2,50	2,10	-	-	3,00	2,50	-	-
M1.4		2,50	2,10	-	-	2,50	2,10	-	-	3,00	2,50	-	-
M1.6	1/16	2,50	2,10	-	-	2,50	2,10	-	-	3,00	2,50	0,141	0,110
M1.7		2,50	2,10	-	-	2,50	2,10	-	-	3,00	2,50	-	-
M1.8		2,50	2,10	-	-	2,50	2,10	-	-	3,00	2,50	0,141	0,110
M2.0		2,80	2,10	2,50	2,00	2,50	2,10	-	-	3,00	2,50	0,141	0,110
M2.2		2,80	2,10	2,80	2,24	2,50	2,10	-	-	3,00	2,50	0,141	0,110
M2.3		2,80	2,10	2,80	2,24	2,50	2,10	-	-	3,00	2,50	-	-
M2.5	3/32	2,80	2,10	2,80	2,24	2,50	2,10	-	-	3,00	2,50	0,141	0,110
M2.6		2,80	2,10	2,80	2,24	2,50	2,10	-	-	3,00	2,50	-	-
M3.0	1/8	3,15	2,50	3,15	2,50	3,50	2,70	3,00	-	4,00	3,00	0,141	0,110
M3.5		3,55	2,80	3,55	2,80	4,00	3,00	2,50	2,10	4,00	3,00	0,141	0,110
M4.0	5/32	4,00	3,15	-	-	4,50	3,40	2,80	2,10	5,00	4,00	0,168	0,131
M4.5	3/16	4,50	3,55	-	-	6,00	4,90	3,50	2,70	5,00	4,00	0,194	0,152
M5.0		5,00	4,00	-	-	6,00	4,90	3,50	2,70	5,50	4,50	0,194	0,152
M6.0	1/4	6,30	5,00	-	-	6,00	4,90	4,50	3,40	6,00	4,50	0,255	0,191
M7.0	5/16	7,10	5,60	-	-	7,00	5,50	5,50	4,30	6,20	5,00	0,318	0,238
M8.0		8,00	6,30	-	-	8,00	6,20	6,00	4,90	6,20	5,00	0,318	0,238
M9.0		9,00	7,10	-	-	9,00	7,00	7,00	5,50	7,00	5,50	0,381	0,286
M10.0	3/8	10,00	8,00	-	-	10,00	8,00	7,00	5,50	7,00	5,50	0,381	0,286
M11.0		8,00	6,30	-	-	-	-	8,00	6,20	8,00	6,20	0,381	0,286
M12.0	1/2	9,00	7,10	-	-	-	-	9,00	7,00	8,50	6,50	0,367	0,275
M14.0	9/16	11,20	9,00	11,20	-	-	-	11,00	9,00	10,50	8,00	0,429	0,322
M16.0	5/8	12,50	10,00	12,50	-	-	-	12,00	9,00	12,50	10,00	0,480	0,360
M18.0	11/16	14,00	11,20	14,00	-	-	-	14,00	11,00	14,00	11,00	0,542	0,406
M20.0	13/16	14,00	11,20	14,00	-	-	-	16,00	12,00	15,00	12,00	0,652	0,489
M22.0	7/8	16,00	12,50	16,00	-	-	-	18,00	14,50	17,00	13,00	0,697	0,523
M24.0	15/16	18,00	14,00	18,00	-	-	-	18,00	14,50	19,00	15,00	0,760	0,570
M27.0	1 1/16	20,00	16,00	20,00	-	-	-	20,00	16,00	20,00	15,00	0,896	0,672
M30.0	1 3/16	20,00	16,00	20,00	-	-	-	22,00	18,00	23,00	23,17	1,021	0,766

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