



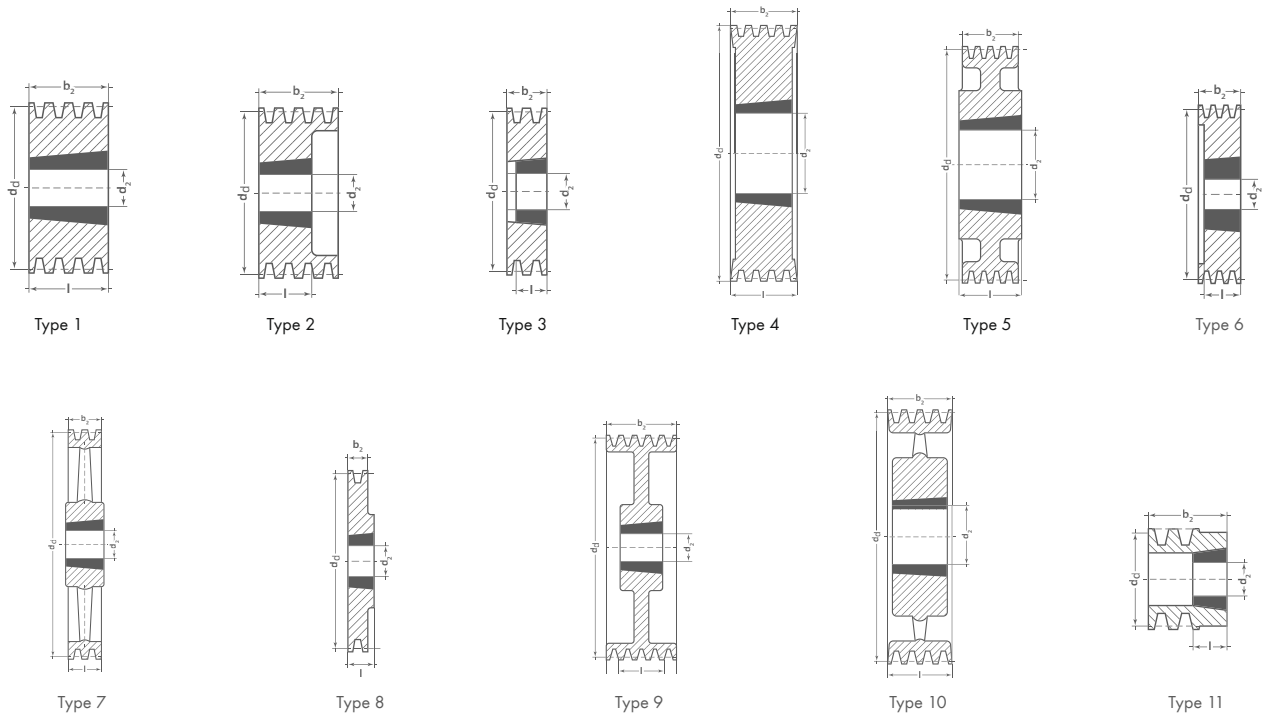
optibelt KS

V-GROOVED PULLEYS
in accordance with DIN 2211

Taper bushes

FOR TAPER BUSHES		
SECTION	ORIENTATION CROSS SECTION	RIBS
SPZ / 10	50–630 mm	1–8
SPA / 13	63–630 mm	1–5
SPB / 17	100–1000 mm	1–10
SPC / 22	200–1250 mm	2–10

FOR CYLINDRICAL BORES		
SECTION	ORIENTATION CROSS SECTION	RIBS
SPZ / 10	45–355 mm	1–3
SPA / 13	50–560 mm	1–5
SPB / 17	56–630 mm	1–6
SPC / 22	180–630 mm	1–6



Balancing:

The list prices apply, as per VDI 2060, to cast iron pulleys balanced in one plane as follows: Grade G 16 for $\varnothing d_d \leq 400$ mm at $n = 1500$ rpm, for $\varnothing d_d > 400$ mm at $v = 30$ m/sec.

Balancing is carried out minus the key on a smooth mandrel. Machines where the rotors are balanced with an adjusting spring inserted in the shaft end must be ordered as follows: "Balanced with finished bore without key on a smooth mandrel without inserted spring".

We recommend balancing in two planes grade G 16 or better if $v \geq 30$ m/sec. or if the ratio between datum diameter and pulley face width $d_d : b_2 < 4$ at $v > 20$ m/sec. Surcharges for balancing on request. Please give pulley operating speed.

We reserve the right to make technical changes.

Surcharges for finished bore H7 and keyway to DIN 6885 part 1						
Quantity	Finished bore up to 30 mm		Finished bore 31 mm to 50 mm		Finished bore 51 mm to 75 mm	
1 to 2						
3 to 5						
6 to 10						
11 to 24						
25 to 50						
over 50						

Special pulleys and custom designed pulleys on request.

optibelt KS V-Grooved Pulleys for Taper Bushings
Profile SPZ



Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing	Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing
TB SPZ/10						112	1	●	8	1.000	1610
50▲	1	●	11	0.300	1008		2	●	6	1.300	1610
	2	●	11	0.400	1008		3	●	6	1.300	2012
56▲	1	●	11	0.400	1008		4	●	6	1.500	2012
	2	●	11	0.500	1108		5	●	6	1.800	2012
60	1	●	11	0.200	1008		6*	●	6	1.900	2012
	2	●	11	0.600	1108	118	1	●	8	0.900	1610
63	1	●	8	0.200	1108		2	●	6	1.300	1610
	2	●	6	0.300	1108		3	●	6	1.600	2012
	3	●	6	0.400	1108		4	●	6	1.800	2012
	3	●	6	0.400	1108		5	●	6	1.800	2012
67	1	●	8	0.300	1108		6*	●	6	2.000	2517
	2	●	6	0.400	1108	125	1	●	8	1.000	1610
	3	●	6	0.500	1108		2	●	6	1.400	1610
71	1	●	8	0.300	1108		3	●	2	1.800	2012
	2	●	6	0.400	1108		4	●	2	2.200	2012
	3	●	6	0.600	1108		5	●	6	2.300	2012
75	1	●	8	0.400	1108		6*	●	6	2.500	2517
	2	●	6	0.400	1210	132	1	●	8	1.100	1610
	3	●	6	0.500	1210		2	●	6	1.500	1610
80	1	●	8	0.500	1210		3	●	2	2.300	2012
	2	●	6	0.600	1210		4	●	2	2.500	2012
	3	●	6	0.700	1210		5	●	6	2.700	2517
	4	●	6	0.800	1210		6*	●	6	2.900	2517
	4	●	6	0.800	1210	140	1	●	8	1.200	1610
85	1	●	8	0.600	1210		2	●	2	1.700	1610
	2	●	6	0.500	1610		3	●	2	2.600	2012
	3	●	6	0.600	1610		4	●	2	2.900	2012
	4	●	6	0.900	1610		5	●	2	3.200	2517
	5	●	6	1.000	1610		6*	●	2	3.500	2517
90	1	●	8	0.700	1210		8*	●	4	4.000	2517
	2	●	6	0.700	1610	150	1	●	8	1.200	1610
	3	●	6	0.800	1610		2	●	8	2.000	2012
	4	●	6	1.000	1610		3	●	2	3.100	2012
	5	●	6	1.200	1610		4	●	2	3.700	2517
95	1	●	8	0.700	1210		5	●	2	4.000	2517
	2	●	6	0.800	1610		6*	●	2	4.400	2517
	3	●	6	0.900	1610		8*	●	4	5.100	2517
	4	●	6	1.100	1610	160	1	●	8	1.300	1610
	5	●	6	1.300	1610		2	●	8	2.500	2012
100	1	●	8	0.800	1210		3	●	2	3.600	2012
	2	●	6	0.900	1610		4	●	2	4.400	2517
	3	●	6	1.100	1610		5	●	2	4.800	2517
	4	●	6	1.100	1610		6*	●	2	5.200	2517
	5	●	6	1.300	2012		8*	●	4	5.600	2517
	6*	●	6	1.400	2012	170	1	●	8	1.500	1610
106	1	●	8	0.900	1610		2	●	8	2.500	2012
	2	●	6	1.100	1610		3	○	9	4.200	2012
	3	●	6	1.300	1610		4	●	2	5.300	2517
	4	●	6	1.300	1610		5	●	2	5.900	2517
	5	●	6	1.500	2012		6*	●	2	6.500	2517
	6*	●	6	1.600	2012						

Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing	Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing
180	1	●	8	1.600	1610	355	1	x	7	3.500	2012
	2	●	8	2.500	2012		2	x	7	5.100	2012
	3	○	9	4.800	2012		3	x	7	7.300	2517
	4	○	9	6.100	2517		4	x	10	8.900	2517
	5	○	9	6.300	2517		5	x	10	10.000	2517
	6*	○	9	6.800	2517		6*	x	10	10.700	2517
	8*	●	4	7.100	3020		8*	x	10	16.000	3030
190	1	●	8	1.800	1610	400	1	x	7	6.000	2012
	2	●	8	2.600	2012		2	x	7	6.300	2517
	3	○	9	4.900	2012		3	x	7	8.000	2517
	4	○	9	5.300	2517		4	x	10	10.100	2517
	5	○	9	6.300	2517		5	x	10	11.700	3020
	6*	○	9	6.900	2517		6*	x	10	14.500	3020
200	1	●	8	2.300	2012		8*	x	10	18.200	3030
	2	●	8	2.800	2012	450	1	x	7	6.100	2517
	3	○	9	3.500	2012		2	x	7	8.200	2517
	4	○	9	4.700	2517		3	x	7	9.800	2517
	5	○	9	5.500	2517		4	x	10	11.800	3020
	6*	○	9	6.100	2517		5	x	10	13.900	3020
	8*	●	4	9.300	3020		6*	x	10	16.900	3030
224	1	○	5	2.500	2012		8*	x	10	24.000	3535
	2	○	5	3.200	2012	500	2	x	7	9.100	2517
	3	○	9	3.900	2012		3	x	7	11.400	2517
	4	○	9	5.200	2517		4	x	10	14.300	3020
	5	○	9	6.000	2517		5	x	10	17.600	3020
	6*	○	9	6.600	2517		6*	x	10	19.900	3020
	8*	●	4	11.800	3020		3*	x	7	15.900	2517
250	1	x	7	2.800	2012	630	4*	x	10	20.000	3020
	2	x	7	3.500	2012		5*	x	10	22.700	3020
	3	x	10	4.300	2012		6*	x	7	33.600	3535
	4	x	10	5.700	2517						
	5	x	10	6.400	2517						
	6*	x	10	7.000	2517						
	8*	x	10	10.500	3020						
280	1	x	7	2.900	2012						
	2	x	7	4.000	2012						
	3	x	7	5.300	2517						
	4	x	10	6.400	2517						
	5	x	10	7.100	2517						
	6*	x	10	7.800	2517						
	8*	x	10	10.800	3020						
315	1	x	7	3.100	2012						
	2	x	7	4.200	2012						
	3	x	7	6.100	2517						
	4	x	10	7.600	2517						
	5	x	10	8.600	2517						
	6*	x	10	9.300	2517						

No. of grooves z	1	2	3	4	5	6	8
Face width b ₂ (mm)	16	28	40	52	64	76	100

Taper bushing	1008	1108	1210	1610	2012	2517	3020	3535
Bore d ₂ (mm) from... to...	10-25	10-28	11-32	14-42	14-50	16-60	25-75	35-90

● Solid pulley ○ Plate pulley (with or without holes) x Spoked pulley
 ▲ only for profile 10
 Material: EN-GJL 200 - DIN EN 1561
 * Non stock items
 Bore diameters d₂ see page 4

optibelt KS V-Grooved Pulleys for Taper Bushings
Profile SPA



Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing	Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing
TB SPA/13						132	1	●	8	1.600	1610
63▲	1	●	11	0.600	1108		2	●	2	1.800	2012
	2	●	11	0.800	1108		3	●	2	2.300	2012
67▲	1	●	8	0.300	1108		4	●	2	2.600	2517
	2	●	6	0.500	1108		5	●	2	2.900	2517
71▲	1	●	8	0.300	1108	140	1	●	8	1.800	1610
	2	●	6	0.500	1108		2	●	2	2.000	2012
	3	●	6	0.700	1108		3	●	2	2.800	2517
75▲	1	●	8	0.400	1108		4	●	2	3.100	2517
	2	●	6	0.600	1108		5	●	2	3.400	2517
	3	●	6	0.800	1108	150	1	●	8	1.400	1610
80▲	1	●	8	0.500	1210		2	●	2	2.400	2012
	2	●	6	0.600	1210		3	●	2	3.500	2517
	3	●	6	0.900	1210		4	●	2	3.800	2517
85	1	●	8	0.600	1210		5	●	2	4.200	2517
	2	●	6	0.700	1210	160	1	○	5	1.900	1610
	3	●	6	1.000	1210		2	●	2	2.900	2012
90	1	●	8	0.700	1210		3	●	2	3.900	2517
	2	●	6	0.700	1610		4	●	2	4.400	2517
	3	●	6	1.000	1610		5	●	2	5.100	2517
	4	●	6	1.200	1615	170	1	○	5	2.000	1610
95	1	●	8	0.800	1210		2	●	2	3.100	2012
	2	●	6	0.900	1610		3	●	2	4.600	2517
	3	●	6	1.100	1610		4	●	2	5.500	2517
	4	●	6	1.400	1615		5	●	2	5.900	3020
100	1	●	8	0.800	1610	180	1	○	5	2.100	1610
	2	●	6	0.900	1610		2	○	9	3.400	2012
	3	●	2	1.200	1610		3	●	2	5.100	2517
	4	●	2	1.700	1610		4	●	2	5.900	2517
	5	●	6	1.900	1610		5	●	2	6.200	3020
106	1	●	8	0.900	1610	190	1	○	5	2.300	1610
	2	●	6	1.100	1610		2	○	9	3.800	2012
	3	●	2	1.400	1610		3	●	2	5.400	2517
	4	●	6	2.000	2012		4	●	2	6.800	2517
	5	●	6	2.000	2012		5	●	2	7.400	3020
112	1	●	8	1.000	1610	200	1	○	5	2.600	2012
	2	●	6	1.200	1610		2	○	5	4.100	2517
	3	●	6	1.300	2012		3	○	9	4.900	2517
	4	●	6	1.900	2012		4	●	2	7.400	3020
	5	●	6	2.100	2012		5	●	4	8.400	3020
118	1	●	8	1.200	1610	212	1	○	5	2.700	2012
	2	●	6	1.400	1610		2	○	5	4.300	2517
	3	●	2	1.800	2012		3	○	9	5.200	2517
	4	●	2	2.000	2012		4	●	2	7.300	3020
	5	●	2	2.400	2012		5	●	2	8.200	3020
125	1	●	8	1.400	1610	224	1	x	7	2.700	2012
	2	●	2	1.700	1610		2	○	5	4.400	2517
	3	●	2	2.000	2012		3	○	9	5.500	2517
	4	●	2	2.500	2012		4	●	2	7.400	3020
	5	●	2	2.700	2012		5	●	2	8.300	3020

Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing	Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing
236	1	x	7	2.800	2012						
	2	○	5	4.600	2517						
	3	○	9	5.700	2517						
	4	●	2	7.800	3020						
	5	●	2	8.700	3020						
250	1	x	7	2.900	2012						
	2	x	7	4.800	2517						
	3	○	9	5.900	2517						
	4	○	9	8.000	3020						
	5	○	9	9.000	3020						
280	1	x	7	3.300	2012						
	2	x	7	5.400	2517						
	3	○	9	6.700	2517						
	4	○	9	8.800	3020						
	5	○	5	15.500	3535						
315	1	x	7	3.600	2012						
	2	x	7	6.000	2517						
	3	○	5	8.300	3020						
	4	○	9	9.700	3020						
	5	○	5	17.000	3535						
355	1	x	7	4.200	2012						
	2	x	7	6.700	2517						
	3	x	7	9.200	3020						
	4	x	10	11.000	3020						
	5	x	7	18.600	3535						
400	1	x	7	4.900	2012						
	2	x	7	8.100	2517						
	3	x	7	11.000	3020						
	4	x	10	12.800	3020						
	5	x	7	21.000	3535						
450	1	x	7	7.000	2012						
	2	x	7	10.300	2517						
	3	x	7	14.100	3020						
	4	x	10	15.500	3020						
	5	x	7	24.300	3535						
500	1	x	7	8.000	2517						
	2	x	7	11.600	2517						
	3	x	7	16.000	3020						
	4	x	10	18.200	3020						
	5	x	7	27.300	3535						
560	1	x	7	11.600	2517						
	2	x	7	15.500	3020						
	3	x	7	17.800	3020						
	4	x	7	26.700	3535						
	5	x	7	30.400	3535						
630	1	x	7	10.100	2517						
	2	x	7	16.000	3020						
	3	x	7	22.000	3020						
	4	x	7	30.800	3535						
	5	x	7	33.700	3535						

No. of grooves z	1	2	3	4	5
Face width b ₂ (mm)	20	35	50	65	80

Taper bushing	1180	1210	1610	1615	2012	2517	3020	3535
Bore d ₂ (mm) from... to...	10-28	11-32	14-42	14-42	14-50	26-60	25-75	35-90

● Solid pulley ○ Plate pulley (with or without holes) x Spoked pulley
 ▲ only for profile 13
 Material: EN-GJL 200 - DIN EN 1561
 Bore diameters d₂ see page 4

Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing	Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing
TB SPB/17						180	1	●	1	4.100	1610
100▲	1	●	1	0.900	1610		2	●	8	4.500	2517
	2	●	6	1.200	1610		3	●	2	5.500	2517
	3	●	6	1.700	1610		4	●	4	6.900	2517
112▲	1	●	1	1.100	1610		5	●	4	7.100	3020
	2	●	6	1.500	1610		6	●	4	7.700	3020
	3	●	6	2.000	1610		8	●	4	9.500	3020
118▲	1	●	1	1.300	1610	190	1	●	8	4.600	2012
	2	●	6	1.700	1610		2	●	8	5.000	2517
	3	●	6	2.300	1610		3	●	2	6.300	2517
125▲	1	●	1	1.500	1610		4	●	4	7.600	2517
	2	●	2	1.900	2012		5	●	4	8.100	3020
	3	●	2	2.400	2012		6	●	4	9.200	3020
	4	●	4	3.000	2012		8	●	4	11.200	3030
	5	●	6	3.500	2012	200	1	●	8	5.000	2012
132▲	1	●	1	1.800	1610		2	●	8	5.400	2517
	2	●	2	2.200	2012		3	●	2	6.500	2517
	3	●	2	2.800	2012		4	●	2	8.800	3020
	4	●	4	3.400	2012		5	●	2	9.100	3020
	5	●	4	3.700	2012		6	●	4	10.300	3020
140	1	●	1	2.300	1610		8	●	4	13.500	3535
	2	●	2	2.700	2012	212	1	●	8	4.200	2012
	3	●	2	3.300	2012		2	●	8	4.900	2517
	4	●	2	3.700	2517		3	●	2	6.000	2517
	5	●	2	4.500	2517		4	●	2	9.800	3020
	6	●	4	4.600	2517		5	●	2	11.000	3020
150	1	●	1	2.700	1610		6	●	4	14.300	3535
	2	●	2	3.100	2012		8	●	4	16.600	3535
	3	●	2	3.900	2517	224	1	●	8	4.700	2012
	4	●	2	4.400	2517		2	●	8	5.300	2517
	5	●	4	5.200	2517		3	●	2	6.300	2517
	6	●	4	5.600	2517		4	●	2	11.300	3020
160	1	●	1	2.500	1610		5	●	2	12.700	3020
	2	●	2	2.900	2012		6	●	4	17.000	3535
	3	●	2	4.200	2517		8	●	4	19.300	3535
	4	●	4	4.900	2517		10	●	4	21.800	3535
	5	●	4	6.000	2517	236	1	●	8	5.000	2012
	6	●	4	5.400	3020		2	●	8	5.500	2517
170	1	●	1	2.900	1610		3	x	10	7.000	2517
	2	●	2	3.300	2012		4	x	10	14.500	3020
	3	●	2	4.900	2517		5	●	6	16.900	3535
	4	●	4	5.700	2517		6	●	4	20.000	3535
	5	●	4	6.100	3020		8	●	4	22.300	3535
	6	●	4	6.500	3020		10	●	4	25.300	3535
	8	●	4	8.000	3020						



optibelt KS V-Grooved Pulleys for Taper Bushings Profile SPB

Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing	Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing
250	1	●	8	5.400	2012	375	2	x	7	9.500	3020
	2	x	7	5.500	2517		3	x	10	11.500	3020
	3	●	2	7.700	3020		4	x	10	16.500	3525
	4	●	2	19.600	3020		6	x	10	25.000	3535
	5	●	4	21.700	3535		8	x	10	28.000	4040
	6	●	4	23.300	3535	400	2	x	7	10.000	3020
	8	●	4	27.500	3535		3	x	7	18.300	3535
	10	●	4	29.300	3535		4	x	7	20.500	3535
265	2	●	7	6.200	2517		5	x	10	23.400	3535
	3	○	9	8.000	3020		6	x	10	25.100	3535
	4	○	9	9.500	3020		8	x	10	36.500	4040
	6	○	9	16.700	3525		10*	x	10	41.000	4040
	8	○	9	24.000	3525	425	2	x	7	11.500	3020
280	1	x	7	6.100	2012		3	x	7	18.000	3535
	2	x	7	6.800	2517		4	x	7	19.500	3535
	3	x	10	8.600	3020		6	x	10	25.100	4040
	4	○	9	10.100	3020		8	x	10	52.500	4545
	5	○	9	17.800	3535	450	2	x	7	12.100	3020
	6	○	9	19.600	3535		3	x	7	21.900	3535
	8	○	9	26.700	3535		4	x	7	24.500	3535
	10	○	9	30.500	3535		5	x	10	27.300	3535
300	2	x	7	7.300	2517		6	x	10	35.500	4040
	3	x	10	9.200	3020		8	x	10	40.900	4040
	4	○	9	14.300	3020		10*	x	10	53.500	4545
	5	○	9	18.200	3535	500	2	x	7	13.200	3020
	6	○	9	21.900	3535		3	x	7	23.100	3535
	8	○	9	26.200	3535		4	x	7	26.600	3535
315	1	x	7	7.200	2012		5	x	10	29.900	3535
	2	x	7	7.800	2517		6	x	10	38.900	4040
	3	x	10	9.600	3020		8	x	10	45.500	4040
	4	○	5	17.100	3535		10*	x	10	61.000	4545
	5	○	9	18.800	3535	560	2	x	7	16.500	3030
	6	○	9	23.000	3535		3	x	7	25.900	3535
	8	○	9	26.000	3535		4	x	7	29.000	3535
	10	○	9	31.500	3535		5	x	7	35.300	4040
335	2	x	7	7.800	2517		6	x	10	43.100	4040
	3	x	10	10.500	3020		8	x	10	49.000	4545
	4	x	7	18.300	3535		10*	x	10	55.700	4545
	5	x	10	19.500	3535	630	2	x	7	18.500	3020
	6	x	10	22.000	3535		3	x	7	28.900	3535
	8	x	10	28.200	3535		4	x	7	33.300	3535
	10*	x	10	36.000	4040		5	x	7	43.100	4040
							6	x	10	49.200	4040
355	2	x	7	8.700	3020		8	x	10	62.000	4545
	3	x	10	10.800	3020	710	10*	x	10	72.000	4545
	4	x	7	18.600	3535		3	x	7	33.200	3535
	5	x	10	20.800	3535		4	x	7	39.100	3535
	6	○	9	22.800	3535		5	x	7	50.200	4040
	8	x	10	27.000	3535		6	x	10	62.300	4545
	10*	x	10	38.000	4040		8	x	10	71.000	4545
							10*	x	10	80.000	4545

● Solid pulley ○ Plate pulley (with or without holes) x Spoked pulley
 Material: EN-GJL 200 - DIN EN 1561
 ▲ only for profile 17
 * Non stock items
 Bore diameters d, see page 4

Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing	Datum diameter d _d (mm)	No. of grooves	Type	Type No.	Weight without bushing (≈kg)	Taper bushing
TB SPC/22						335	3	○	5	22.500	3535
200▲	3	●	4	9.000	2517		4	○	9	26.500	3535
	4	●	4	10.500	3020		5	○	9	30.000	3535
	5	●	4	14.000	3535		6	○	9	35.000	3535
	6	●	4	17.000	3535		8	○	9	58.000	4040
212▲	3	●	4	10.000	3020	355	3	○	5	22.900	3535
	4	●	4	12.500	3020		4	○	9	28.300	3535
	5	●	4	15.000	3535		5	○	9	32.500	3535
	6	●	4	18.000	3535		6	○	9	36.000	3535
224	2	●	4	8.100	3020		8	○	9	67.500	4040
	3	●	4	11.000	3020	375	10*	○	9	121.000	4545
	4	●	4	14.000	3535		3	○	5	23.800	3535
	5	●	4	16.200	3535		4	○	9	30.000	3535
	6	●	4	19.000	3535		5	○	9	33.000	3535
236	8	●	4	24.900	3535		6	○	9	45.500	4040
	3	●	4	12.000	3020	400	8	○	9	68.000	4545
	4	●	4	17.200	3535		3	x	7	24.100	3535
	5	●	4	19.100	3535		4	x	10	28.000	3535
	6	●	4	20.800	3535		5	x	10	34.000	3535
250	8	●	4	25.500	3535		6	○	9	48.000	4040
	2	●	4	9.800	3020	425	8	○	9	65.000	4545
	3	●	4	14.500	3020		10*	○	9	88.000	5050
	4	●	4	20.700	3535		3	x	7	26.000	3535
	5	●	4	22.800	3535	450	4	x	10	31.000	3535
265	6	●	4	26.000	3535		5	○	9	45.000	4040
	8	●	4	29.700	3535		6	○	9	58.000	4545
	10*	●	4	34.000	4040		8	○	9	74.000	4545
	3	●	8	21.200	3535	475	3	x	7	28.600	3535
	4	○	9	24.000	3535		4	x	10	33.500	3535
280	5	○	9	31.200	3535		5	x	10	45.000	4040
	6	○	9	29.000	3535		6	○	9	61.100	4545
	8	○	9	33.300	3535		8	○	9	78.700	5050
	3	●	8	24.000	3535	500	10*	○	9	101.000	5050
	4	○	9	29.000	3535		3	x	7	40.000	3535
300	5	○	9	31.000	3535		4	x	10	47.000	3535
	6	○	9	33.800	3535		5	x	10	47.200	4040
	8	○	9	375.000	3535		6	○	9	62.800	4545
	10*	○	9	45.000	4040		8	○	9	81.500	5050
	3	○	5	21.000	3535	560	10*	○	9	127.000	5050
315	4	○	9	25.000	3535		3	x	7	36.000	3535
	5	○	9	28.500	3535		4	x	10	50.000	4040
	6	○	9	29.000	3535		5	x	10	63.000	4545
	8	●	4	46.500	4040		6	x	10	77.000	5050
	10*	○	9	53.500	4545		8	x	10	94.000	5050
315	3	○	5	21.600	3535		10	○	9	115.000	5050
	4	○	9	24.600	3535						
	5	○	9	29.000	3535						
	6	○	9	31.400	3535						
	8	●	4	50.000	4040						
	10*	○	9	58.000	4545						

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Datum diameter d_d (mm)	No. of grooves	Type	Weight (≈kg)	Finished bore hole d_{max} (mm)	Hub length l (mm)	Datum diameter d_d (mm)	No. of grooves	Type	Weight (≈kg)	Finished bore hole d_{max} (mm)	Hub length l (mm)
SPZ/10						140	1	○	0.900	28	24
45▲	1	○	0.200	16	24		2	○	1.400	38	38
	2	○	0.300	16	35		3	○	1.700	38	40
50▲	3	○	0.400	16	35	150	1	x	1.100	28	24
	1	○	0.300	20	24		2	○	1.500	38	38
	2	○	0.400	20	35		3	○	1.900	38	40
56▲	3	○	0.500	20	40	160	1	x	1.200	32	30
	1	○	0.300	20	24		2	x	1.600	38	38
	2	○	0.500	25	35		3	x	2.400	42	40
63	3	○	0.700	25	40	170	1	x	1.700	40	30
	1	○	0.300	25	24		2	x	1.900	40	38
	2	○	0.600	25	35		3	x	3.000	42	40
71	3	○	0.900	25	40	180	1	x	2.100	32	30
	1	○	0.300	25	24		2	x	3.100	38	38
	2	○	0.600	25	35		3	x	3.500	42	40
75	3	○	1.000	30	40	190	1	x	2.300	35	30
	1	○	0.400	24	24		2	x	2.400	35	38
	2	○	0.600	24	35		3	x	4.000	35	40
80	3	○	1.100	28	40	200	1	x	2.400	32	38
	1	○	0.400	25	24		2	x	2.900	38	38
	2	○	0.700	30	35		3	x	4.500	42	40
85	3	○	1.100	38	35	212	1	x	2.600	35	30
	1	○	0.300	25	24		2	x	3.400	35	38
	2	○	0.700	30	35		3	x	5.000	38	40
90	3	○	1.100	38	35	225	1	x	2.800	32	38
	1	○	0.400	25	24		2	x	4.000	38	38
	2	○	0.800	30	35		3	x	5.300	42	40
95	3	○	1.200	38	38	250	1	x	3.300	32	38
	1	○	0.400	28	24		2	x	4.800	38	38
	2	○	0.800	28	35		3	x	6.000	42	40
100	3	○	1.200	38	38	280	1	x	3.900	35	34
	1	○	0.500	28	24		2	x	5.200	42	38
	2	○	0.900	30	35		3	x	7.000	48	40
106	3	○	1.300	38	38	315	1	x	4.400	35	34
	1	○	0.500	30	24		2	x	6.800	42	38
	2	○	1.000	28	35		3	x	8.300	48	40
112	3	○	1.300	38	38	355	1	x	4.600	35	34
	1	○	0.500	28	24		2	x	8.000	42	40
	2	○	1.000	30	35		3	x	10.000	48	45
118	3	○	1.400	38	38						
	1	○	0.600	28	24						
	2	○	1.100	38	35						
125	3	○	1.500	38	38						
	1	○	0.700	28	24						
	2	○	1.200	38	35						
132	3	○	1.600	38	40						
	1	○	0.800	30	24						
	2	○	1.300	38	35						
	3	○	1.600	40	40						

No. of grooves z	1	2	3
Face width b_2 (mm)	16	28	40

● Solid pulley ○ Plate pulley (with or without holes) x Spoked pulley
▲ only for profile 10
Hub position: one side flush
Material: EN-GJL 200 - DIN EN 1561

Datum diameter d _d (mm)	No. of grooves	Type	Weight (≈kg)	Finished bore hole d _{max} (mm)	Hub length l (mm)	Datum diameter d _d (mm)	No. of grooves	Type	Weight (≈kg)	Finished bore hole d _{max} (mm)	Hub length l (mm)
SPA/13						106	1	○	0.900	28	34
50▲	1	○	0.300	18	34		2	○	1.700	28	49
	2	○	0.500	18	49		3	○	2.200	32	42
	3	○	0.600	18	47		4	○	3.200	32	53
56▲	1	○	0.400	20	34		5	○	3.900	35	60
	2	○	0.600	20	49	112	1	○	1.100	28	34
	3	○	0.700	20	47		2	○	1.800	38	49
63▲	1	○	0.500	25	34		3	○	2.400	38	42
	2	○	0.800	25	49		4	○	3.400	42	53
	3	○	0.900	25	47		5	○	4.000	42	60
	4	○	1.200	25	60	118	1	○	1.100	32	34
	5	○	1.500	25	70		2	○	1.800	38	49
71▲	1	○	0.500	25	34		3	○	2.400	42	42
	2	○	0.900	28	49		4	○	3.400	42	53
	3	○	1.000	32	42		5	○	4.100	48	65
	4	○	1.500	32	60	125	1	○	1.400	32	34
	5	○	1.800	32	70		2	○	1.900	38	49
75▲	1	○	0.500	24	34		3	○	2.600	42	42
	2	○	1.000	24	49		4	○	3.500	42	53
	3	○	1.100	24	42		5	○	4.400	48	65
	4	○	1.800	24	60	132	1	○	1.500	32	34
	5	○	1.900	28	82		2	○	2.200	38	49
80▲	1	○	0.600	28	34		3	○	2.600	42	42
	2	○	1.000	32	49		4	○	3.600	42	53
	3	○	1.200	38	42		5	○	4.800	48	65
	4	○	1.900	38	60	140	1	○	1.500	32	34
	5	○	2.000	38	55		2	○	2.300	38	49
85	1	○	0.600	24	34		3	○	2.600	42	42
	2	○	1.200	28	49		4	○	3.700	42	53
	3	○	1.400	28	42		5	○	5.000	48	65
	4	○	2.000	28	53	150	1	x	1.600	38	36
	5	○	2.200	32	55		2	x	2.600	38	49
90	1	○	0.900	28	34		3	○	3.000	42	42
	2	○	1.500	32	49		4	○	4.000	42	53
	3	○	1.600	38	42		5	○	5.200	48	65
	4	○	2.200	42	53	160	1	x	1.800	38	36
	5	○	2.500	42	67		2	x	2.400	38	49
95	1	○	0.800	28	34		3	x	2.800	42	42
	2	○	1.600	28	49		4	○	3.600	48	60
	3	○	1.900	28	42		5	○	5.500	48	70
	4	○	2.500	32	53	170	1	x	2.000	35	36
	5	○	2.800	35	67		2	x	2.900	35	49
100	1	○	0.800	28	34		3	x	3.200	35	42
	2	○	1.400	32	49		4	x	4.200	35	60
	3	○	2.000	38	42		5	x	5.800	38	70
	4	○	2.700	42	53	180	1	x	2.000	38	36
	5	○	3.100	42	60		2	x	3.200	42	49
							3	x	3.600	42	42
							4	x	4.700	48	60
							5	x	6.100	48	70

Datum diameter d_d (mm)	No. of grooves	Type	Weight (≈kg)	Finished bore hole d_{max} (mm)	Hub length l (mm)	Datum diameter d_d (mm)	No. of grooves	Type	Weight (≈kg)	Finished bore hole d_{max} (mm)	Hub length l (mm)
190	1	x	2.000	38	36	400	1	x	6.900	50	50
	2	x	3.200	42	49		2	x	8.800	55	53
	3	x	4.000	42	42		3	x	10.500	60	47
	4	x	5.200	48	60		4	x	12.400	60	67
	5	x	6.300	48	70		5	x	15.900	60	82
200	1	x	2.400	38	36	450	1	x	7.500	55	50
	2	x	2.900	42	49		2	x	9.400	55	53
	3	x	4.200	48	42		3	x	12.200	60	47
	4	x	5.000	55	60		4	x	14.200	65	67
	5	x	6.500	55	70		5	x	18.300	65	82
212	1	x	2.700	40	36	500	1	x	10.500	55	50
	2	x	3.400	42	49		2	x	10.700	55	55
	3	x	4.400	42	42		3	x	13.500	60	60
	4	x	5.700	42	60		4	x	16.300	65	67
	5	x	6.900	42	70		5	x	22.800	65	82
225	1	x	2.800	40	36	560	1	x	14.000	55	60
	2	x	3.900	42	49		2	x	13.100	55	60
	3	x	4.600	42	42		3	x	15.600	60	74
	4	x	6.500	42	60		4	x	19.400	65	67
	5	x	7.300	42	70		5	x	24.500	65	82
236	1	x	3.300	38	36						
	2	x	4.100	42	49						
	3	x	4.900	48	47						
	4	x	6.200	55	60						
	5	x	7.500	55	70						
250	1	x	3.400	42	36						
	2	x	4.300	48	49						
	3	x	5.300	48	47						
	4	x	7.000	55	60						
	5	x	7.900	60	70						
280	1	x	3.900	42	44						
	2	x	5.400	48	53						
	3	x	6.500	48	47						
	4	x	8.500	55	60						
	5	x	9.900	60	70						
300	1	x	4.300	48	44						
	2	x	5.900	48	53						
	3	x	7.500	55	47						
	4	x	9.800	55	60						
	5	x	11.300	60	70						
315	1	x	4.800	48	44						
	2	x	6.600	48	53						
	3	x	8.800	55	47						
	4	x	11.100	55	60						
	5	x	10.500	60	70						
355	1	x	5.500	48	44						
	2	x	7.700	55	53						
	3	x	9.600	55	47						
	4	x	11.800	55	60						
	5	x	13.800	60	70						

No. of grooves z	1	2	3	4	5
Face width b_2 (mm)	20	35	50	67	82

● Solid pulley ○ Plate pulley (with or without holes) x Spoked pulley
 ▲ only for profile 13
 Hub position: one side flush
 Material: EN-GJL 200 - DIN EN 1561

Datum diameter d _d (mm)	No. of grooves	Type	Weight (≈kg)	Finished bore hole d _{max} (mm)	Hub length l (mm)	Datum diameter d _d (mm)	No. of grooves	Type	Weight (≈kg)	Finished bore hole d _{max} (mm)	Hub length l (mm)
SPB/17						118▲	1	○	1.600	32	41
56▲	1	○	0.600	20	41		2	○	2.400	38	60
	2	○	1.000	20	60		3	○	3.200	42	55
	3	○	1.100	22	62		4	○	5.200	42	70
63▲	1	○	0.800	20	41		5	○	7.200	42	75
	2	○	1.200	20	60	125▲	6	○	6.600	42	85
	3	○	1.200	22	62		1	○	1.700	32	41
71▲	1	○	0.800	22	41		2	○	2.600	38	60
	2	○	1.300	22	60		3	○	3.300	42	55
	3	○	1.600	22	55		4	○	4.700	42	70
75▲	1	○	0.800	25	41		5	○	8.600	42	75
	2	○	1.400	25	60		6	○	8.000	48	85
	3	○	1.900	25	62	132▲	1	○	1.900	30	41
80▲	1	○	1.000	28	41		2	○	2.600	30	60
	2	○	1.700	28	60		3	○	3.500	42	55
	3	○	2.100	28	55		4	○	6.300	42	70
	4	○	2.400	28	70		5	○	9.400	42	75
	5	○	2.700	28	80		6	○	8.500	42	85
85▲	1	○	1.100	30	41	140	1	○	2.100	32	41
	2	○	1.700	30	60		2	○	2.900	38	60
	3	○	2.200	30	55		3	○	3.900	42	55
	4	○	2.700	30	70		4	○	6.900	42	70
	5	○	3.000	30	75		5	○	7.600	48	75
							6	○	11.400	48	85
90▲	1	○	1.200	32	41	150	1	○	2.400	32	43
	2	○	1.800	38	60		2	○	3.200	38	48
	3	○	2.300	38	55		3	○	4.300	42	60
	4	○	3.100	38	70		4	○	6.800	42	70
	5	○	3.300	38	75		5	○	8.400	48	75
							6	○	12.100	48	85
95▲	1	○	1.300	35	41	160	1	x	2.500	38	43
	2	○	2.000	38	60		2	x	3.300	42	48
	3	○	2.500	38	67		3	x	4.600	48	60
	4	○	2.900	38	70		4	○	7.000	48	70
	5	○	3.600	38	75		5	○	9.400	48	75
							6	○	12.900	55	85
100▲	1	○	1.300	32	41	170	1	x	2.900	42	43
	2	○	2.100	38	60		2	x	3.400	42	48
	3	○	2.900	38	55		3	x	4.900	42	60
	4	○	3.800	38	70		4	○	7.200	48	70
	5	○	4.500	38	75		5	○	8.900	48	75
	6	○	5.200	38	124		6	○	13.100	48	85
106▲	1	○	1.500	28	41	180	1	x	3.100	38	43
	2	○	2.000	28	60		2	x	3.900	42	48
	3	○	3.000	30	55		3	x	5.300	48	60
	4	○	4.300	30	70		4	x	7.400	48	70
	5	○	5.100	32	75		5	○	9.100	55	75
	6	○	6.000	32	124		6	○	10.800	60	85
112▲	1	○	1.500	32	41						
	2	○	2.400	38	60						
	3	○	3.100	38	55						
	4	○	4.800	42	67						
	5	○	5.600	42	75						
	6	○	6.200	42	85						

Datum diameter d_d (mm)	No. of grooves	Type	Weight (≈kg)	Finished bore hole d_{max} (mm)	Hub length l (mm)	Datum diameter d_d (mm)	No. of grooves	Type	Weight (≈kg)	Finished bore hole d_{max} (mm)	Hub length l (mm)
190	1	x	3.200	42	43	355	1	x	7.000	48	49
	2	x	4.200	42	48		2	x	9.700	55	55
	3	x	5.500	42	60		3	x	13.400	55	67
	4	x	7.700	48	70		4	x	18.300	60	80
	5	○	9.200	50	75		5	x	18.800	65	75
	6	○	12.000	55	85		6	x	19.800	75	90
200	1	x	3.400	38	43	400	1	x	8.500	50	49
	2	x	4.500	42	48		2	x	10.000	55	55
	3	x	5.900	48	60		3	x	14.300	60	67
	4	x	8.000	50	60		4	x	18.500	65	80
	5	○	9.500	55	80		5	x	22.500	70	85
	6	○	12.200	60	90		6	x	28.000	75	90
212	1	x	3.800	42	43	450	1	x	9.900	50	55
	2	x	4.700	42	48		2	x	10.900	55	55
	3	x	6.200	48	60		3	x	15.100	60	67
	4	x	7.700	50	70		4	x	20.500	65	80
	5	x	10.300	50	80		5	x	26.000	70	80
	6	○	13.500	55	90		6	x	28.900	75	90
225	1	x	4.000	42	43	500	1	x	10.700	50	55
	2	x	5.400	42	48		2	x	13.700	60	59
	3	x	6.900	48	60		3	x	15.200	65	67
	4	x	8.600	55	70		4	x	21.300	70	80
	5	○	11.700	50	90		5	x	30.000	75	80
	6	○	14.800	55	90		6	x	33.800	80	90
250	1	x	4.200	42	43	560	2	x	15.000	60	55
	2	x	6.100	48	55		3	x	24.200	65	67
	3	x	8.600	55	60		4	x	26.000	70	80
	4	x	9.800	60	70		5	x	34.400	75	80
	5	x	13.200	65	80		6	x	39.000	80	90
	6	x	17.000	65	90		2	x	20.200	60	80
280	1	x	5.700	48	49	630	3	x	27.000	65	80
	2	x	7.000	48	55		4	x	30.800	75	86
	3	x	9.700	55	60		5	x	37.200	80	90
	4	x	11.500	60	70		6	x	44.000	90	100
	5	x	15.500	65	80						
	6	x	18.000	65	90						
300	1	x	5.900	48	49						
	2	x	7.500	48	55						
	3	x	10.500	55	67						
	4	x	12.400	60	80						
	5	x	16.500	65	80						
	6	x	18.300	70	90						
315	1	x	6.400	48	49						
	2	x	8.200	55	55						
	3	x	12.900	55	67						
	4	x	13.000	60	80						
	5	x	17.600	65	80						
	6	x	20.600	75	90						

No. of grooves z	1	2	3	4	5	6
Face width b_2 (mm)	25	44	63	86	105	124

● Solid pulley ○ Plate pulley (with or without holes) x Spoked pulley
 ▲ only for profile 17
 Hub position: one side flush
 Material: EN-GJL 200 - DIN EN 1561

Datum diameter d_d (mm)	No. of grooves	Type	Weight (=kg)	Finished bore hole d_{max} (mm)	Hub length l (mm)	Datum diameter d_d (mm)	No. of grooves	Type	Weight (=kg)	Finished bore hole d_{max} (mm)	Hub length l (mm)
SPC/22						450	2*	x	21.100	70	80
180	1*	○	4.200	40	54		3*	x	26.300	75	90
	2*	○	7.200	50	64		4*	x	31.100	75	105
	3*	○	10.400	55	90		5*	x	42.200	80	110
	4*	○	10.500	55	95		6*	x	48.500	80	120
	5*	○	18.000	60	100	500	3*	x	28.400	75	90
200	6*	○	23.600	65	115		4*	x	34.100	75	105
	1*	○	4.800	40	54		5*	x	48.200	80	110
	2*	○	7.800	50	64		6*	x	52.500	80	120
	3*	○	8.800	55	90	560	3*	x	31.100	75	90
	4*	○	11.200	60	95		4*	x	39.000	75	105
	5*	○	15.400	65	100		5*	x	54.100	80	110
	6*	○	27.000	70	125		6*	x	61.500	85	120
225	1*	x	5.500	48	54	630	3*	x	38.500	80	90
	2*	x	7.800	52	64		4*	x	48.100	80	105
	3*	x	10.600	52	90		5*	x	62.200	85	110
	4*	x	13.100	55	95		6*	x	73.200	85	120
	5*	x	16.700	60	100						
	6*	x	35.000	60	115						
250	1*	x	7.300	52	54						
	2*	x	8.800	52	64						
	3*	x	11.000	65	90						
	4*	x	15.300	70	95						
	5*	x	19.000	75	100						
	6*	x	23.700	60	115						
280	1*	x	8.700	52	54						
	2*	x	10.900	55	64						
	3*	x	15.600	70	90						
	4*	x	17.500	75	95						
	5*	x	20.500	75	100						
315	1*	x	9.100	52	54						
	2*	x	13.000	55	74						
	3*	x	17.100	70	90						
	4*	x	20.000	75	95						
	5*	x	24.700	80	100						
	6*	x	31.200	85	115						
335	2*	x	14.000	55	74						
	3*	x	18.300	55	90						
	4*	x	22.400	60	95						
	5*	x	28.300	65	100						
	6*	x	34.400	75	115						
355	2*	x	15.200	60	74						
	3*	x	19.200	70	90						
	4*	x	25.800	70	95						
	5*	x	32.000	75	100						
	6*	x	36.200	75	115	400	3*	x	20.600	70	90
400	3*	x	20.600	70	90		4*	x	28.000	70	105
	4*	x	28.000	70	105		5*	x	32.000	75	100

No. of grooves z	1	2	3	4	5	6
Face width b_2 (mm)	38	64	90	116	142	168

● Spoiled pulley ○ Plate pulley (with or without holes) x Spoked pulley
 * Non stock items
 Hub position: one side flush
 Material: EN-GJL 200 - DIN EN 1561



optibelt TB

TAPER BUSHES

DIMENSIONS	
TAPER BUSHES	BORE DIAMETERS
1008	10–25 mm
1108	10–28 mm
1210	11–32 mm
1215	11–32 mm
1310	14–35 mm
1610	14–42 mm
1615	14–42 mm
2012	14–50 mm
2517	16–60 mm
3020	25–75 mm
3030	35–75 mm
3525	35–90 mm
3535	35–90 mm
4040	40–100 mm
4545	55–110 mm
5050	70–125 mm



optibelt CE

BASE ELEMENT

DIMENSIONS	
DESIGNATION	BORE DIAMETERS
CE01	18–400 mm
CE02	6–100 mm
CE03	6–150 mm
CE04	20–180 mm
CE05	20–200 mm
CE06	20–180 mm
CE07	20–200 mm
CE08	25–200 mm
CE09	45–100 mm
CE10	14–60 mm
CE11	14–60 mm
CE12	16–60 mm
CE13	15–70 mm
CE14	24–260 mm

	1008	1108	1210	1215	1310	1610	1615	2012	2517	3020	3030	3525	3535	4040	4545	5050
optibelt TB with metric bores																
Bore diameter d ₂ (mm)	10 11 12 14 15 16 18 19 20 22 24 24▲ 25▲	10 11 12 14 15 16 18 19 20 22 24 25 28▲	11 12 14 16 18 19 20 22 24 25 28 30 32	11 12 14 16 18 19 20 22 24 25 28 30 32	14 16 18 19 20 22 24 25 28 30 32 35	14 16 18 19 20 22 24 25 28 30 32 35 38 40 42▲	14 16 18 19 20 22 24 25 28 30 32 35 38 40 42▲	14 16 18 19 20 22 24 25 28 30 32 35 38 40 42 45 48 50	16 18 19 20 22 24 25 28 30 32 35 38 40 42 45 48 50	25 28 30 32 35 38 40 42 45 48 50	35 38 40 42 45 48 50 55 60 65 70 75	35 38 40 42 45 48 50 55 60 65 70 75 80 85 90	35 38 40 42 45 48 50 55 60 65 70 75 80 85 90	40 42 45 48 50 55 60 65 70 75 80 85 90 95 100	55 60 65 70 75 80 85 90 95 100 105 110 115 120 125	70 75 80 85 90 95 100 105 110 115 120 125
Hexagon Socket screws (inch)	1/4 x 1/2	1/4 x 1/2	3/8 x 5/8	3/8 x 5/8	3/8 x 5/8	3/8 x 5/8	3/8 x 5/8	7/16 x 7/8	1/2 x 1	5/8 x 1 1/4	5/8 x 1 1/4	1/2 x 1 1/2	1/2 x 1 1/2	5/8 x 1 3/4	3/4 x 2	7/8 x 2 1/4
Tightening torque (Nm)	5.7	5.7	20.0	20.0	20.0	20.0	20.0	31.0	49.0	92.0	92.0	115.0	115.0	172.0	195.0	275.0
Bushing length (mm)	22.3	22.3	25.4	38.1	25.4	25.4	38.1	31.8	43.2	50.8	76.2	63.5	88.9	101.6	114.3	127.0
Weight at d _{2min} (≈kg)	0.12	0.16	0.28	0.39	0.32	0.41	0.60	0.75	1.06	2.50	3.75	3.90	5.13	7.68	12.70	15.17

Shallow keyways for taper bushings					
Bore diameter d ₂ (mm)	Keyway width b (mm)	Keyway depth t ₂ (mm)	Bore diameter d ₂ (mm)	Keyway width b (mm)	Keyway depth t ₂ (mm)
24	8	2.0	28	8	2.0
25	8	1.3	42	12	2.2

From 3525: Hexagon head screw. ▲ These bores have swallow keyways

	1008	1108	1210	1215	1310	1610	1615	2012	2517	3020	3030	3525	3535	4040	4545	5050
optibelt TB with inch bores																
Bore diameter d ₂ (inch)	3/8* 1/2 5/8 3/4 7/8* 1▲	3/8* 1/2 5/8 3/4 7/8 1 1 1/8▲*	1/2 5/8 3/4 7/8 1 1 1/8 1 1/4	5/8* 3/4 7/8 1 1 1/8 1 1/4	1/2* 5/8* 3/4* 7/8* 1* 1 1/8 1 1/4 1 3/8 1 1/2	1/2 5/8 3/4 7/8 1 1 1/8 1 1/4 1 3/8 1 1/2 1 5/8	1/2 5/8 3/4 7/8 1 1 1/8 1 1/4 1 3/8 1 1/2 1 5/8▲*	5/8* 3/4 7/8 1 1 1/8 1 1/4 1 3/8 1 1/2 1 3/4 1 7/8 2	3/4 7/8 1 1 1/8 1 1/2 1 1/4 1 3/8 1 5/8 1 7/8 2 2 1/8 2 1/4 2 3/8 2 7/8 3	1 1/4 1 3/8 1 1/2 1 5/8 1 7/8 2 2 1/8 2 1/4 2 3/8 2 7/8 3	1 1/4 1 3/8 1 1/2 1 5/8 1 7/8 2 2 1/8 2 1/4 2 3/8 2 7/8 3	1 1/2* 1 5/8* 1 3/4* 1 7/8* 2* 2 1/8* 2 1/2* 2 3/8* 2 5/8* 2 7/8* 3* 3 1/8* 3 1/4* 3 3/8* 3 1/2* 3 1/2▲*	1 1/2 1 5/8 1 3/4 1 7/8 2 2 1/8 2 1/2 2 3/8 2 5/8 2 7/8 3 3 1/8 3 1/4 3 3/8 3 1/2 3 1/2▲	1 3/4* 1 7/8* 2* 2 1/8* 2 1/4* 2 1/2* 2 3/8* 2 5/8* 2 7/8* 3* 3 1/8* 3 1/4* 3 3/8* 3 1/2* 3 3/4* 4* 4 1/4* 4 1/2* 4 3/4* 5* 5 1/4* 5 1/2* 5 3/4* 6* 6 1/4* 6 1/2* 6 3/4* 7* 7 1/4* 7 1/2* 7 3/4* 8* 8 1/4* 8 1/2* 8 3/4* 9* 9 1/4* 9 1/2* 9 3/4* 10* 10 1/4* 10 1/2* 10 3/4* 11* 11 1/4* 11 1/2* 11 3/4* 12* 12 1/4* 12 1/2* 12 3/4* 13* 13 1/4* 13 1/2* 13 3/4* 14* 14 1/4* 14 1/2* 14 3/4* 15* 15 1/4* 15 1/2* 15 3/4* 16* 16 1/4* 16 1/2* 16 3/4* 17* 17 1/4* 17 1/2* 17 3/4* 18* 18 1/4* 18 1/2* 18 3/4* 19* 19 1/4* 19 1/2* 19 3/4* 20* 20 1/4* 20 1/2* 20 3/4* 21* 21 1/4* 21 1/2* 21 3/4* 22* 22 1/4* 22 1/2* 22 3/4* 23* 23 1/4* 23 1/2* 23 3/4* 24* 24 1/4* 24 1/2* 24 3/4* 25* 25 1/4* 25 1/2* 25 3/4* 26* 26 1/4* 26 1/2* 26 3/4* 27* 27 1/4* 27 1/2* 27 3/4* 28* 28 1/4* 28 1/2* 28 3/4* 29* 29 1/4* 29 1/2* 29 3/4* 30* 30 1/4* 30 1/2* 30 3/4* 31* 31 1/4* 31 1/2* 31 3/4* 32* 32 1/4* 32 1/2* 32 3/4* 33* 33 1/4* 33 1/2* 33 3/4* 34* 34 1/4* 34 1/2* 34 3/4* 35* 35 1/4* 35 1/2* 35 3/4* 36* 36 1/4* 36 1/2* 36 3/4* 37* 37 1/4* 37 1/2* 37 3/4* 38* 38 1/4* 38 1/2* 38 3/4* 39* 39 1/4* 39 1/2* 39 3/4* 40* 40 1/4* 40 1/2* 40 3/4* 41* 41 1/4* 41 1/2* 41 3/4* 42* 42 1/4* 42 1/2* 42 3/4* 43* 43 1/4* 43 1/2* 43 3/4* 44* 44 1/4* 44 1/2* 44 3/4* 45* 45 1/4* 45 1/2* 45 3/4* 46* 46 1/4* 46 1/2* 46 3/4* 47* 47 1/4* 47 1/2* 47 3/4* 48* 48 1/4* 48 1/2* 48 3/4* 49* 49 1/4* 49 1/2* 49 3/4* 50* 50 1/4* 50 1/2* 50 3/4* 51* 51 1/4* 51 1/2* 51 3/4* 52* 52 1/4* 52 1/2* 52 3/4* 53* 53 1/4* 53 1/2* 53 3/4* 54* 54 1/4* 54 1/2* 54 3/4* 55* 55 1/4* 55 1/2* 55 3/4* 56* 56 1/4* 56 1/2* 56 3/4* 57* 57 1/4* 57 1/2* 57 3/4* 58* 58 1/4* 58 1/2* 58 3/4* 59* 59 1/4* 59 1/2* 59 3/4* 60* 60 1/4* 60 1/2* 60 3/4* 61* 61 1/4* 61 1/2* 61 3/4* 62* 62 1/4* 62 1/2* 62 3/4* 63* 63 1/4* 63 1/2* 63 3/4* 64* 64 1/4* 64 1/2* 64 3/4* 65* 65 1/4* 65 1/2* 65 3/4* 66* 66 1/4* 66 1/2* 66 3/4* 67* 67 1/4* 67 1/2* 67 3/4* 68* 68 1/4* 68 1/2* 68 3/4* 69* 69 1/4* 69 1/2* 69 3/4* 70* 70 1/4* 70 1/2* 70 3/4* 71* 71 1/4* 71 1/2* 71 3/4* 72* 72 1/4* 72 1/2* 72 3/4* 73* 73 1/4* 73 1/2* 73 3/4* 74* 74 1/4* 74 1/2* 74 3/4* 75* 75 1/4* 75 1/2* 75 3/4* 76* 76 1/4* 76 1/2* 76 3/4* 77* 77 1/4* 77 1/2* 77 3/4* 78* 78 1/4* 78 1/2* 78 3/4* 79* 79 1/4* 79 1/2* 79 3/4* 80* 80 1/4* 80 1/2* 80 3/4* 81* 81 1/4* 81 1/2* 81 3/4* 82* 82 1/4* 82 1/2* 82 3/4* 83* 83 1/4* 83 1/2* 83 3/4* 84* 84 1/4* 84 1/2* 84 3/4* 85* 85 1/4* 85 1/2* 85 3/4* 86* 86 1/4* 86 1/2* 86 3/4* 87* 87 1/4* 87 1/2* 87 3/4* 88* 88 1/4* 88 1/2* 88 3/4* 89* 89 1/4* 89 1/2* 89 3/4* 90* 90 1/4* 90 1/2* 90 3/4* 91* 91 1/4* 91 1/2* 91 3/4* 92* 92 1/4* 92 1/2* 92 3/4* 93* 93 1/4* 93 1/2* 93 3/4* 94* 94 1/4* 94 1/2* 94 3/4* 95* 95 1/4* 95 1/2* 95 3/4* 96* 96 1/4* 96 1/2* 96 3/4* 97* 97 1/4* 97 1/2* 97 3/4* 98* 98 1/4* 98 1/2* 98 3/4* 99* 99 1/4* 99 1/2* 99 3/4* 100* 100 1/4* 100 1/2* 100 3/4* 101* 101 1/4* 101 1/2* 101 3/4* 102* 102 1/4* 102 1/2* 102 3/4* 103* 103 1/4* 103 1/2* 103 3/4* 104* 104 1/4* 104 1/2* 104 3/4* 105* 105 1/4* 105 1/2* 105 3/4* 106* 106 1/4* 106 1/2* 106 3/4* 107* 107 1/4* 107 1/2* 107 3/4* 108* 108 1/4* 108 1/2* 108 3/4* 109* 109 1/4* 109 1/2* 109 3/4* 110* 110 1/4* 110 1/2* 110 3/4* 111* 111 1/4* 111 1/2* 111 3/4* 112* 112 1/4* 112 1/2* 112 3/4* 113* 113 1/4* 113 1/2* 113 3/4* 114* 114 1/4* 114 1/2* 114 3/4* 115* 115 1/4* 115 1/2* 115 3/4* 116* 116 1/4* 116 1/2* 116 3/4* 117* 117 1/4* 117 1/2* 117 3/4* 118* 118 1/4* 118 1/2* 118 3/4* 119* 119 1/4* 119 1/2* 119 3/4* 120* 120 1/4* 120 1/2* 120 3/4* 121* 121 1/4* 121 1/2* 121 3/4* 122* 122 1/4* 122 1/2* 122 3/4* 123* 123 1/4* 123 1/2* 123 3/4* 124* 124 1/4* 124 1/2* 124 3/4* 125* 125 1/4* 125 1/2* 125 3/4* 126* 126 1/4* 126 1/2* 126 3/4* 127* 127 1/4* 127 1/2* 127 3/4* 128* 128 1/4* 128 1/2* 128 3/4* 129* 129 1/4* 129 1/2* 129 3/4* 130* 130 1/4* 130 1/2* 130 3/4* 131* 131 1/4* 131 1/2* 131 3/4* 132* 132 1/4* 132 1/2* 132 3/4* 133* 133 1/4* 133 1/2* 133 3/4* 134* 134 1/4* 134 1/2* 134 3/4* 135* 135 1/4* 135 1/2* 135 3/4* 136* 136 1/4* 136 1/2* 136 3/4* 137* 137 1/4* 137 1/2* 137 3/4* 138* 138 1/4* 138 1/2* 138 3/4* 139* 139 1/4* 139 1/2* 139 3/4* 140* 140 1/4* 140 1/2* 140 3/4* 141* 141 1/4* 141 1/2* 141 3/4* 142* 142 1/4* 142 1/2* 142 3/4* 143* 143 1/4* 143 1/2* 143 3/4* 144* 144 1/4* 144 1/2* 144 3/4* 145* 145 1/4* 145 1/2* 145 3/4* 146* 146 1/4* 146 1/2* 146 3/4* 147* 147 1/4* 147 1/2* 147 3/4* 148* 148 1/4* 148 1/2* 148 3/4* 149* 149 1/4* 149 1/2* 149 3/4* 150* 150 1/4* 150 1/2* 150 3/4* 151* 151 1/4* 151 1/2* 151 3/4* 152* 152 1/4* 152 1/2* 152 3/4* 153* 153 1/4* 153 1/2* 153 3/4* 154* 154 1/4* 154 1/2* 154 3/4* 155* 155 1/4* 155 1/2* 155 3/4* 156* 156 1/4* 156 1/2* 156 3/4* 157* 157 1/4* 157 1/2* 157 3/4* 158* 158 1/4* 158 1/2* 158 3/4* 159* 159 1/4* 159 1/2* 159 3/4* 160* 160 1/4* 160 1/2* 160 3/4* 161* 161 1/4* 161 1/2* 161 3/4* 162* 162 1/4* 162 1/2* 162 3/4* 163* 163 1/4* 163 1/2* 163 3/4* 164* 164 1/4* 164 1/2* 164 3/4* 165* 165 1/4* 165 1/2* 165 3/4* 166* 166 1/4* 166 1/2* 166 3/4* 167* 167 1/4* 167 1/2* 167 3/4* 168* 168 1/4* 168 1/2* 168 3/4* 169* 169 1/4* 169 1/2* 169 3/4* 170* 170 1/4* 170 1/2* 170 3/4* 171* 171 1/4* 171 1/2* 171 3/4* 172* 172 1/4* 172 1/2* 172 3/4* 173* 173 1/4* 173 1/2* 173 3/4* 174* 174 1/4* 174 1/2* 174 3/4* 175* 175 1/4* 175 1/2* 175 3/4* 176* 176 1/4* 176 1/2* 176 3/4* 177* 177 1/4* 177 1/2* 177 3/4* 178* 178 1/4* 178 1/2* 178 3/4* 179* 179 1/4* 179 1/2* 179 3/4* 180* 180 1/4* 180 1/2* 180 3/4* 181* 181 1/4* 181 1/2* 181 3/4* 182* 182 1/4* 182 1/2* 182 3/4* 183* 183 1/4* 183 1/2* 183 3/4* 184* 184 1/4* 184 1/2* 184 3/4* 185* 185 1/4* 185 1/2* 185 3/4* 186* 186 1/4* 186 1/2* 186 3/4* 187* 187 1/4* 187 1/2* 187 3/4* 188* 188 1/4* 188 1/2* 188 3/4* 189* 189 1/4* 189 1/2* 189 3/4* 190* 190 1/4* 190 1/2* 190 3/4* 191* 191 1/4* 191 1/2* 191 3/4* 192* 192 1/4* 192 1/2* 192 3/4* 193* 193 1/4* 193 1/2* 193 3/4* 194* 194 1/4* 194 1/2* 194 3/4* 195* 195 1/4* 195 1/2* 195 3/4* 196* 196 1/4* 196 1/2* 196 3/4* 197* 197 1/4* 197 1/2* 197 3/4* 198* 198 1/4* 198 1/2* 198 3/4* 199* 199 1/4* 199 1/2* 199 3/4* 200* 200 1/4* 200 1/2* 200 3/4* 201* 201 1/4* 201 1/2* 201 3/4* 202* 202 1/4* 202 1/2* 202 3/4* 203* 203 1/4* 203 1/2* 203 3/4* 204* 204 1/4* 204 1/2* 204 3/4* 205* 205 1/4* 205 1/2* 205 3/4* 206* 206 1/4* 206 1/2* 206 3/4* 207* 207 1/4* 207 1/2* 207 3/4* 208* 208 1/4* 208 1/2* 208 3/4* 209* 209 1/4* 209 1/2* 209 3/4* 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