KOP

COACH SCREW DIN571

CE
EN 14592

CE MARKING
Screws with the CE mark, in accordance with EN 14592.

HEXAGONAL HEAD
Appropriate for use on plates in steel-to-timber applications, thanks to its hexagonal head.

OUTDOOR VERSION
Also available in stainless steel A2 | AISI304 for outdoor use (service class 3).

KOP AI571

DIAMETER [mm]	6	8 – 16	16
LENGTH [mm]	40	50 – 400	1000

MATERIAL

Zn ELECTRO PLATED	electrogalvanized carbon steel	SC2	C2 T2
A2 AISI 304	A2 | AISI304 austenitic stainless steel (CRC II)	SC3	C4 T4

FIELDS OF USE
- timber based panels
- fibreboard and MDF panels
- solid timber
- glulam (Glued Laminated Timber)
- CLT, LVL

CODES AND DIMENSIONS

KOP

Zn ELECTRO PLATED

d_1 [mm]	CODE	L [mm]	pcs
8 SW 13	KOP850(*)	50	100
	KOP860	60	100
	KOP870	70	100
	KOP880	80	100
	KOP8100	100	50
	KOP8120	120	50
	KOP8140	140	50
	KOP8160	160	50
	KOP8180	180	50
	KOP8200	200	50
10 SW 17	KOP1050(*)	50	50
	KOP1060(*)	60	50
	KOP1080	80	50
	KOP10100	100	50
	KOP10120	120	50
	KOP10140	140	50
	KOP10150	150	50
	KOP10160	160	50
	KOP10180	180	50
	KOP10200	200	50
	KOP10220	220	50
	KOP10240	240	50
	KOP10260	260	50
	KOP10280	280	50
	KOP10300	300	50
12 SW 19	KOP1250(*)	50	50
	KOP1260(*)	60	50
	KOP1270(*)	70	50
	KOP1280	80	50
	KOP1290	90	50
	KOP12100	100	25
	KOP12120	120	25
	KOP12140	140	25

d_1 [mm]	CODE	L [mm]	pcs
12 SW 19	KOP12150	150	25
	KOP12160	160	25
	KOP12180	180	25
	KOP12200	200	25
	KOP12220	220	25
	KOP12240	240	25
	KOP12260	260	25
	KOP12280	280	25
	KOP12300	300	25
	KOP12320	320	25
	KOP12340	340	25
	KOP12360	360	25
	KOP12380	380	25
	KOP12400	400	25
16 SW 24	KOP1680(*)	80	25
	KOP16100(*)	100	25
	KOP16120	120	25
	KOP16140	140	25
	KOP16150	150	25
	KOP16160	160	25
	KOP16180	180	25
	KOP16200	200	25
	KOP16220	220	25
	KOP16240	240	25
	KOP16260	260	25
	KOP16280	280	25
	KOP16300	300	25
	KOP16320	320	25
	KOP16340	340	25
	KOP16360	360	25
	KOP16380	380	25
	KOP16400	400	25

(*) Not holding CE marking.

AI571 - A2 | AISI304 VERSION

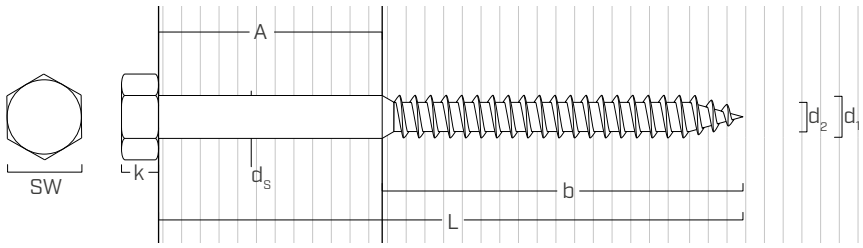
A2 AISI 304

d_1 [mm]	CODE	L [mm]	pcs
8 SW 13	AI571850	50	100
	AI571860	60	100
	AI571880	80	100
	AI5718100	100	100
	AI5718120	120	100
10 SW 17	AI5711050	50	100
	AI5711060	60	100
	AI5711080	80	100
	AI57110100	100	50
	AI57110120	120	50
	AI57110140	140	50
	AI57110160	160	50
	AI57110180	180	50
	AI57110200	200	50

d_1 [mm]	CODE	L [mm]	pcs
12 SW 19	AI57112100	100	50
	AI57112120	120	25
	AI57112140	140	25
	AI57112160	160	25
	AI57112180	180	25

The stainless steel screws have not been granted the CE mark.

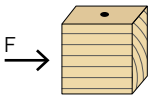
GEOMETRY AND MECHANICAL CHARACTERISTICS | KOP



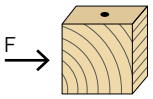
Nominal diameter	**d_1**	**[mm]**	**8**	**10**	**12**	**16**
Wrench size	SW	[mm]	13	17	19	24
Head thickness	k	[mm]	5,50	7,00	8,00	10,00
Thread diameter	d_2	[mm]	5,60	7,00	9,00	12,00
Shank diameter	d_S	[mm]	8,00	10,00	12,00	16,00
Diameter pre-drilling hole - smooth part	d_{V1}	[mm]	8,0	10,0	12,0	16,0
Diameter pre-drilling hole - threaded part	d_{V2}	[mm]	5,5	7,0	8,5	11,0
Thread length	b	[mm]		≥ 0,6 L		
Characteristic tensile strength	$f_{tens,k}$	[kN]	13,0	21,23	32,0	60,0
Characteristic yield moment	$M_{y,k}$	[Nm]	16,9	30,0	56,0	125,0
Characteristic withdrawal-resistance parameter	$f_{ax,k}$	[N/mm²]	11,6	12,4	10,0	9,9
Associated density	ρ_a	[kg/m³]	350	350	350	350
Characteristic head-pull-through parameter	$f_{head,k}$	[N/mm²]	16,5	16,3	14,0	12,9
Associated density	ρ_a	[kg/m³]	350	350	350	350

MINIMUM DISTANCES FOR SHEAR LOADS

screws inserted **WITH pre-drilled hole**

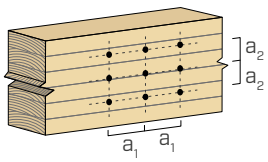


d_1	**[mm]**		**8**	**10**	**12**	**16**
a_1	[mm]	**5·d**	40	50	60	80
a_2	[mm]	**4·d**	32	40	48	64
$a_{3,t}$	[mm]	**min (7·d;80)**	80	80	84	112
$a_{3,c}$	[mm]	**4·d**	32	40	48	64
$a_{4,t}$	[mm]	**3·d**	24	30	36	48
$a_{4,c}$	[mm]	**3·d**	24	30	36	48

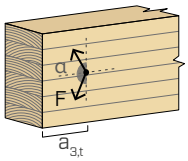


d_1	**[mm]**		**8**	**10**	**12**	**16**
a_1	[mm]	**4·d**	32	40	48	64
a_2	[mm]	**4·d**	32	40	48	64
$a_{3,t}$	[mm]	**min (7·d;80)**	80	80	84	112
$a_{3,c}$	[mm]	**7·d**	56	70	84	112
$a_{4,t}$	[mm]	**4·d**	32	40	48	64
$a_{4,c}$	[mm]	**3·d**	24	30	36	48

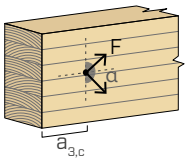
α = load-to-grain angle
d = d_1 = nominal screw diameter



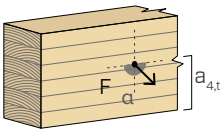
stressed end
-90° < α < 90°



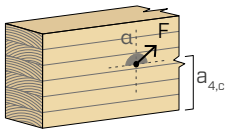
unloaded end
90° < α < 270°



stressed edge
0° < α < 180°

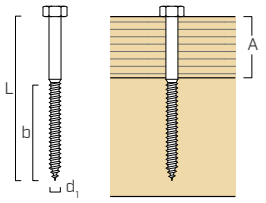
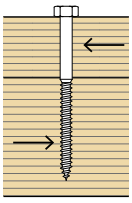
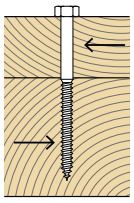
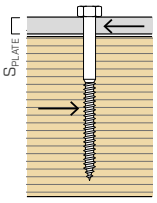
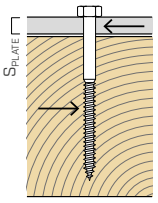
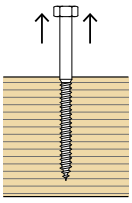
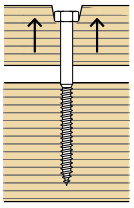


unload edge
180° < α < 360°

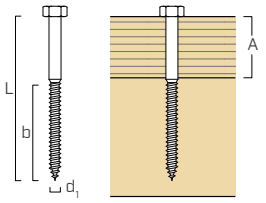
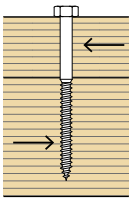
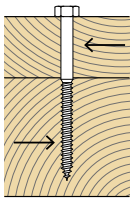
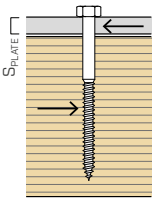
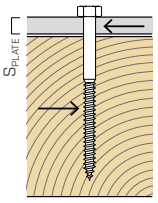
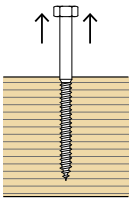
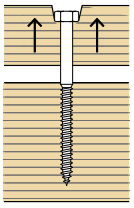


NOTES

- Minimum distances in accordance with EN 1995:2014.
- For KOP screws a pre-drill is required as per EN 1995:2014:
  - pre-drill hole for smooth part of the shank, dimensions matching that of the shank itself, depth equal to the length of the shank.
  - pre-drill hole for the threaded portion, equal to approximately 70% of the shank diameter.

geometry				SHEAR						TENSION	
				timber-to-timber α=0°	timber-to-timber α=90°	steel-timber thick plate α=0°		steel-timber thick plate α=90°		thread withdrawal	head pull-through
											
d_1 [mm]	L [mm]	b [mm]	A [mm]	$R_{V,0,k}$ [kN]	$R_{V,90,k}$ [kN]	S_{PLATE} [mm]	$R_{V,k}$ [kN]	S_{PLATE} [mm]	$R_{V,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]
8	50	30	20	3,17	2,44	8	5,31	8	4,05	3,00	3,32
	60	36	24	3,46	2,82		5,46		4,66	3,61	3,32
	70	42	28	3,70	2,96		5,61		4,81	4,21	3,32
	80	48	32	3,96	3,12		5,76		4,96	4,81	3,32
	100	60	40	4,05	3,47		6,06		5,26	6,01	3,32
	120	72	48	4,05	3,49		6,36		5,56	7,21	3,32
	140	84	56	4,05	3,49		6,66		5,86	8,41	3,32
	160	96	64	4,05	3,49		6,96		6,16	9,61	3,32
	180	108	72	4,05	3,49		7,26		6,46	10,82	3,32
	200	120	80	4,05	3,49		7,56		6,76	12,02	3,32
10	50	30	20	4,04	3,03	10	6,74	10	5,15	4,01	5,61
	60	36	24	4,76	3,64		7,92		5,95	4,81	5,61
	80	48	32	5,50	4,41		8,32		7,08	6,41	5,61
	100	60	40	6,13	4,79		8,72		7,49	8,01	5,61
	120	72	48	6,15	5,21		9,12		7,89	9,61	5,61
	140	84	56	6,15	5,28		9,52		8,29	11,21	5,61
	150	90	60	6,15	5,28		9,72		8,49	12,02	5,61
	160	96	64	6,15	5,28		9,92		8,69	12,82	5,61
	180	108	72	6,15	5,28		10,32		9,09	14,42	5,61
	200	120	80	6,15	5,28		10,72		9,49	16,02	5,61
	220	132	88	6,15	5,28		11,12		9,89	17,62	5,61
	240	144	96	6,15	5,28		11,52		10,29	19,22	5,61
	260	156	104	6,15	5,28		11,92		10,69	20,83	5,61
	280	168	112	6,15	5,28		12,02		10,79	22,43	5,61
	300	180	120	6,15	5,28		12,02		10,79	24,03	5,61
12	50	30	20	4,54	3,30	12	8,19	12	6,33	3,89	6,01
	60	36	24	5,45	3,97		9,39		7,06	4,66	6,01
	70	42	28	6,36	4,63		10,70		7,91	5,44	6,01
	80	48	32	6,89	5,24		11,49		8,83	6,22	6,01
	90	54	36	7,20	5,69		11,69		9,78	6,99	6,01
	100	60	40	7,54	5,88		11,88		9,98	7,77	6,01
	120	72	48	8,27	6,30		12,27		10,37	9,32	6,01
	140	84	56	8,53	6,77		12,66		10,75	10,88	6,01
	150	90	60	8,53	7,01		12,85		10,95	11,66	6,01
	160	96	64	8,53	7,18		13,05		11,14	12,43	6,01
	180	108	72	8,53	7,18		13,43		11,53	13,99	6,01
	200	120	80	8,53	7,18		13,82		11,92	15,54	6,01
	220	132	88	8,53	7,18		14,21		12,31	17,10	6,01
	240	144	96	8,53	7,18		14,60		12,70	18,65	6,01
	260	156	104	8,53	7,18		14,99		13,09	20,20	6,01
	280	168	112	8,53	7,18		15,38		13,47	21,76	6,01
	300	180	120	8,53	7,18		15,77		13,86	23,31	6,01
	320	192	128	8,53	7,18		16,15		14,25	24,87	6,01
	340	195(*)	145	8,53	7,18		16,25		14,35	25,25	6,01
	360	195(*)	165	8,53	7,18		16,25		14,35	25,25	6,01
	380	195(*)	185	8,53	7,18		16,25		14,35	25,25	6,01
	400	195	205	8,53	7,18		16,25		14,35	25,25	6,01

α = load-to-grain angle

geometry				SHEAR						TENSION	
				timber-to-timber α=0°	timber-to-timber α=90°	steel-timber thick plate α=0°		steel-timber thick plate α=90°		thread withdrawal	head pull-through
											
d_1 [mm]	L [mm]	b [mm]	A [mm]	$R_{V,0,k}$ [kN]	$R_{V,90,k}$ [kN]	S_{PLATE} [mm]	$R_{V,k}$ [kN]	S_{PLATE} [mm]	$R_{V,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]
16	80	48	32	9,33	6,63	16	15,98	16	11,75	8,24	8,86
	100	60	40	11,08	7,93		19,32		13,90	10,30	8,86
	120	72	48	11,86	9,07		19,84		16,25	12,36	8,86
	140	84	56	12,73	9,57		20,35		16,89	14,42	8,86
	150	90	60	13,19	9,83		20,61		17,15	15,45	8,86
	160	96	64	13,67	10,09		20,87		17,40	16,48	8,86
	180	108	72	14,06	10,65		21,38		17,92	18,54	8,86
	200	120	80	14,06	11,25		21,90		18,43	20,60	8,86
	220	132	88	14,06	11,61		22,41		18,95	22,66	8,86
	240	144	96	14,06	11,61		22,93		19,46	24,72	8,86
	260	156	104	14,06	11,61		23,44		19,98	26,78	8,86
	280	168	112	14,06	11,61		23,96		20,49	28,84	8,86
	300	180	120	14,06	11,61		24,47		21,01	30,90	8,86
	320	192	128	14,06	11,61		24,99		21,52	32,96	8,86
	340	204	136	14,06	11,61		25,50		22,04	35,01	8,86
	360	205(*)	155	14,06	11,61		25,55		22,08	35,19	8,86
	380	205(*)	175	14,06	11,61		25,55		22,08	35,19	8,86
	400	205(*)	195	14,06	11,61		25,55		22,08	35,19	8,86

α = load-to-grain angle

STRUCTURAL VALUES

GENERAL PRINCIPLES

- Characteristic values are consistent with EN 1995:2014 and in accordance with EN 14592.
- Design values can be obtained from characteristic values as follows:

$$R_d = \frac{R_k \cdot k_{mod}}{\gamma_M}$$

  The coefficients γ_M and k_{mod} should be taken according to the current regulations used for the calculation.
- Mechanical strength values and KOP screw geometry according to CE marking according to EN 14592.
- Dimensioning and verification of the timber elements must be carried out separately.
- The characteristic shear resistance values are calculated for screws inserted with pre-drilling hole.
- The screws must be positioned in accordance with the minimum distances.
- The thread withdrawal characteristic strength has been evaluated considering a fixing length equal to b.
- The head pull-through characteristic strength was calculated using timber elements.
  In the case of steel-to-timber connections, generally the steel tensile strength is binding with respect to head separation or pull-through.

NOTES

- The characteristic timber-to-timber shear strengths were evaluated by considering an angle α between the acting force and the grains of the timber elements of both 0° ($R_{v,0,k}$) and 90° ($R_{v,90,k}$).
- The characteristic steel-timber shear strengths were evaluated considering an angle α between the acting force and the grains of the timber element of both 0° ($R_{v,0,k}$) and 90° ($R_{v,90,k}$).
- The shear strength characteristics on the plate are calculated considering the case of a thick plate ($S_{PLATE} = d_1$).
- The characteristic thread withdrawal resistances were evaluated by considering an angle α of 90° ($R_{ax,90,k}$) between the acting force and the grains of the timber elements.
- During calculation, a thread length of b = 0,6 L is used, with the exception of the measures (*).
- For the calculation process a timber characteristic density ρ_k = 385 kg/m^3 has been considered.
  For different ρ_k values, the strength values in the table can be converted by the k_{dens} coefficient.
- For a row of n screws arranged parallel to the direction of the grain at a distance a_1, the characteristic effective shear bearing capacity $R_{ef,V,k}$ can be calculated by means of the effective number n_{ef}.