







Benefits of Peikko® fastening plates

- ETA-approval (SBKL, JPL):
 - No commercial nor technical limitations, free movement of the products over borders
 - Ease of design; precalculated capacities can be used together with Eurocode all over EU
 - Products are authorized to have CE-marking. Products fullfill the required quality and safety criterias
- Precalculated capacities speed up the design work
- Standardized products enable fast deliveries directly from storage
- Multitude of material options and combinations enable the use even in the most demanding cases
- Different types of fastening plates available for all sorts of loading situations
- The capacities and dimensioning criteria can easily be checked with the free PeikPlat -dimensioning software



CONCRETE CONNECTIONS

Peikko benefits

- reliable: passed demanding test program
- competitive price and delivery time
- economical and easy to use in designing, manufacturing and installation of the elements

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1. DESCRIPTION OF THE SYSTEM

SBKL, KL, JPL and PKL fastening plates are steelparts that are installed before the concrete hard-

ens. The plates transfer the loads from plate to the concrete structure. Structural fixings are made by welding to the steel plate.



2. DIMENSIONS AND **MATERIALS**

Each parts' dimensions and materials are described in section 8.

3. MANUFACTURING

3.1 Manufacturing method

Plates Ribbed bars Angle bars Weld

Flame or mechanical cutting Mechanical cutting

Mechanical cutting MAG by hand or with a robot,

automatic stud welding (SBKL 50/100, 100/100, 100/150 and 150/150) or arc stud welding (SBKL acc. SFS-EN ISO 13918 and SFS-EN ISO 14555)

Welding class

C (SFS-EN 25817)

3.2 Quality control

The quality control involved in producing the steel parts conforms to the requirements set by the Finnish Code of Building Regulations. Peikko Finland Oy is under the Inspecta Certification for quality control.

Each parts' certified product declarations and manufacturing markings are described in section 8.

4. CAPACITIES

Each parts' capacities are described in section 8.

5. APPLICATION

An extensive range of standard sizes is maintained. Other sizes can be manufactured when needed. Capacities of those can be interpolated between standard plates. When interpolating plate thickness,

anchor size, anchor length and fastening area should be noted. Capacities can be checked also with Peik-Plat dimensioning program.

5.1 Limitations for application

The capacities of the fastening plates have been calculated for static loads. In the case of dynamic and fatigue loads, greater safety factors have to be used individually for each case.

20 mm eccentricity caused by manufacturing and installation tolerances has been taken into account in capacities. Bigger eccentricities of fastening must be taken into account when designing plates.

Usability of the S355J0 material has to be checked individually for each case.

5.2 Design principles

5.2.1 Dimensioning

The calculations are made according to following regulations and instructions:

RakMK B4, regulations 2005 (Finnish Building Codes) RakMK B7, regulations 1996 (Finnish Building Codes)

5.2.2 Combined tensions (action)

Combined tensions must be checked (interaction) if the fastening plate is loaded with shear and tension loads.

Common case:

V_d, N_d, T_d and M_d are design values of action V_{Rd} , N_{Rd} , T_{Rd} and M_{Rd} are capacities or design resistances

5.2.3 Fastening areas

5.2.3.1 SBKL, KL and PKL fastening plates

Tension capacities and bending moment must be reduced when the true fastening area is smaller than the required fastening area (see tables (Min. area of fastening) of capacities). For shear loaded plates this reduction is not needed.

$$\begin{split} &\left(\frac{N_d}{N_{Rd}}\right)^{\frac{4}{3}} + \left(\frac{V_d}{V_{Rd}}\right)^{\frac{4}{3}} \leq 1 \\ &N_d = N_{Rd} \times \frac{M_{dA}}{M_{RdA}} + N_{Rd} \times \frac{M_{dD}}{M_{RdD}} + N_d \\ &V_d = V_{Rd} \times \frac{T_d}{T_{Rd}} + V_d \end{split}$$

 N_{red} (M_{red}) new capacity N_{Rd} (M_{Rd})

capacity in table

centerpoint distance of anchors

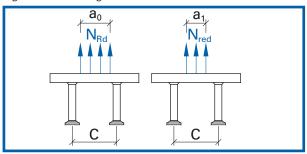
$$N_{red} = N_{Rd} \times \frac{(c - a_0)}{(c - a_1)} > 0.2 \times N_{Rd}$$
, $(a_0 > a_1)$

a₀ edge measurement of fastening area

from tables

a₁ edge dimension of true fastening area

Figure 1. Fastening area



NOTE! The reduction of the fixing area applies only to the design of the thickness of the plate. The reduced capacity is not used when calculating combined impact of the strengths.

5.2.3.2 JPL fastening plate

Tension- and bending moment capacities must be reduced when the true fastening area is smaller than the required fastening area. For shear or torsion loaded plates this reduction is not needed.

The correction factor is aquired the following way:

Figure 2. Calculation of fastening area

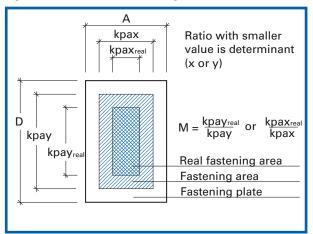
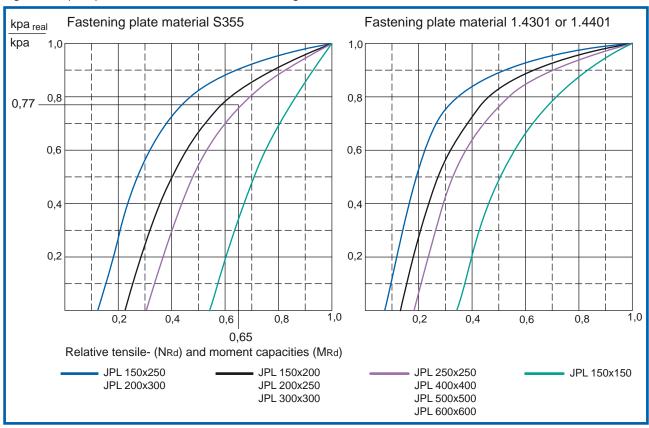


Figure 3. Capacity reduction factor for smaller fastening areas.



e.g. 120x120 RHS tube fastened into JPL 250/250 plate.

$$\frac{\text{kpa}_{\text{real}}}{\text{kpa}} = \frac{120}{155} = 0.77 \rightarrow M_{\text{Rd}} = 0.65 \times 49.7 \text{ kNm} = 32.3 \text{ kNm}$$

5.3The edge and centre distances

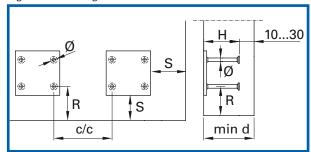
Tensile force

 $R \ge 8 \times \emptyset$ (SBKL, KL, PKL) $R \ge 11 \times \emptyset$ (JPL) $c/c = 2 \times R$

Shear force

$$R \geq \frac{\left(1,05 \; x \; V_{ud}\right)}{H} \; \geq 6 \; x \; \emptyset$$

Figure 4. The edge and centre distances



The small distance of another fastening plate doesn't reduce the shear capacities. The edge distance of KL fastening plates for tension are designed like ribbed bars in accordance with ENV.

5.4 Correction of JPL fastening plates' capacity

Table 1. Correction of JPL fastening plates' capacity

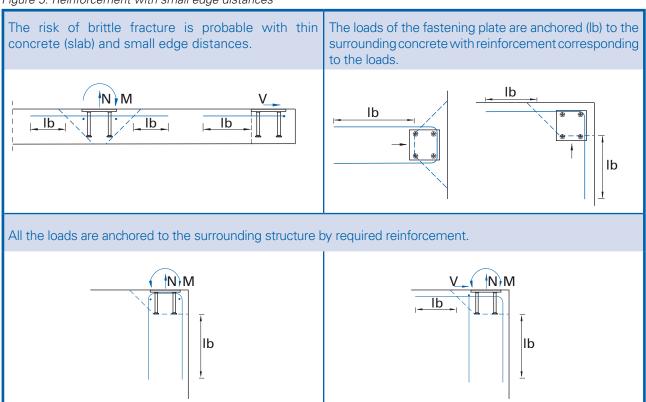
	Tensile N _{Rd}	Bending moment M _{Rd}	Shear V _{Rd}	Torsion T _{Rd}			
Small edge distances R* Smaller edge distances than 11 x Ø, the edge needs to be reinforced accordingly the loads of the fastening plate. Minimum edge distance from plate's edge is 15 mm							
S _{min} = 15 mm	need to be reduced in distances R/4Ø so that	Edge distances < 4Ø the given capacities need to be reduced in ratio to edge distances R/4Ø so that capacities are 0 when edge distance is R = 1,5 x Ø					
Distance c/c to another fastening plate	If distance < 22 x Ø, re corresponding to plate used		If the edge distances are not small, or the concrete bedding is reinforced according to planned forces, the plates can be placed side by side.				
Small fastening area	Capacities are reduced	d acc. section 5.2.3.2	The reduction of capacities is not needed				
Concrete strenght < K30	Capacities are reduced tensile strength	d in ratio to concrete	Capacities are reduced to square root of the compression strength				
Concrete strenght > K30	By increasing the cond	crete strenght, the capa	cities cannot be influend	ced.			
Bond coefficient II	Capacities has to be re	educed with value 0,7.	The capacities do not	need to be reduced.			
Structural class 1	Capacities can be multiplied with value 1,09.						
Reinforcement	Recommended to use with small edge distances when the tenacious fracture can be made sure.						
Dynamic load	In the case of dynamic and fatigue loads greater safety factors have to be considered individually for each case.						

^{*} Edge and c/c distances are measured from centre of the anchor bar.

5.5 Reinforcement

When the fastening plate is close to an edge, another plate or on a cracked ground, a full concrete cone is not possible which leads to brittle failure. In such cases, the loads must be divided to the surrounding constructions by reinforcement. Nevertheless the reinforcement of the ground does not increase the capacity of the fastening plate shown in tables. The reinforcement bars must be placed close to the fastening plate's anchors so that it is inside the concrete cone and is fully anchored (lb) to the outside of this breaking area.

Figure 5. Reinforcement with small edge distances



6. INSTALLATION

The precise position of the fastening plate is indicated on the design drawings.

Fastening plates can be fixed on the formwork/mould by nailing, gluing, two-sided sticker tape or by clamping. Nail holes in plate for easy fixing are also available by request.

In casting, the dropping height of the concrete shall be kept as small as possible. This way the mass stays even and the fastening plate is not exposed to great impelling forces. There should be paid close attention during casting, that the fastening plates position stays unchanged.

The concrete under the heads of headed studs or achors as well as under the base plate should be properly compacted.

6.1 Installation tolerances

6.1.1 In situ

In situ casted concrete structures, normal class (acc. BY 39, Finnish)

in direction parallel to the plane \pm 15 mm in direction perpendicular to the plane \pm 5 mm

6.1.2 Concrete elements

Tolerance for concrete elements, normal class, (acc. SBK 1.20, Finnish)

in direction parallel to the plane; longitudinal \pm 15 mm in direction parallel to the plane; transversal \pm 10 mm in direction perpendicular to the plane \pm 5 mm

6.2 Welding

6.2.1 Welding to the fastening plate

Especially in demanding welding works, it is most recommended, that the designer makes a welding plan, which notes the welding orders and the welding fillet etc.

All impurities, which can have a degenerating effect on welding, must be removed from the surface before welding. Such matter can be such as:

- oil, grease and dirt
- paint and zinc coating etc.

The method of welding must be chosen so that a sufficient welding quality for the required welding class is achieved.

The following procedures, for example, aid in this:

- the welds and the welding must be done symmetrically relations the crosssections centre of gravity
- welding has to be done in direction from the structures centre towards the sides, unless other actions are done
- separate structural elements should be allowed to move freely as long as possible during the welding procedure
- in the case of different needs of heating, preheating should be done separately
- if the temperature is below –5°C preheating is recommended in any case

6.2.2 Welding to the anchor bars and headed studs

The anchorage can be welded with all normal fusion-welding methods.

In the structural as well as assembling weldings, following issues must be considered:

- In a moist or low temperature (below –5 °C) surroundings the steel must be preheated to min.
 +50 °C temperature. The bigger diameter of the bar the more important is the preheating.
- The weldable steel must be cleaned from ice, snow, moisture, rust, paint, grease and other impurities
- Sufficient welding current should be used and in pin welding, the diameter of the pin must be large enough in relation to the bar
- The welder must be qualified

Table 2. Normative recommendations for welding fillet with common steel qualities

		THE MAT		LDED ON TH ART	HE STEEL
		S235JR S355JO, S355J2+N		1.4301	1.4401
L PART	S235JR	ED708 6 /			
THE MATERIAL OF THE STEEL PART	S355J0, S355J2+N	ER70S-6 / E70C-6MI			
1ATERIAL	1.4301				
THE N	1.4401		ER30	9MoL	-

6.3 Bending the anchors

The anchoring of the JPL, SBKL and PKL fastening plates is based on the concrete cone which is due to the headed studs. Bending of the anchors reduces the capacities of tension and moment of fastening plates because it downsizes the concrete cone. In the case of bending the anchors the capacities of the fastening plate must be checked.

7. USING PEIKPLAT -SOFTWARE TO CALCU-LATE THE CAPACITY OF FASTENING PLATE

With PeikPlat dimensioning software the capacity of fastening plate can be easily and quickly calculated and verified.

The software can be freely downloaded from Peikko's website www.peikko.com.

7.1 Using the software

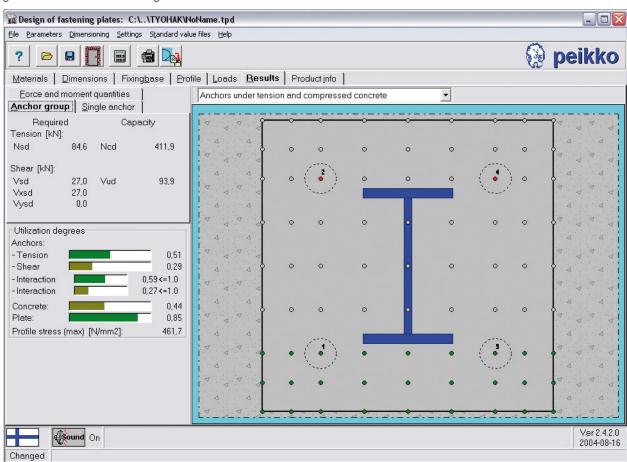
1. First, determine the design values of forces on the surface of the fastening plate.

 N_{zd} = design value of normal force [kN] V_{xd}/V_{yd} = design value of shear force [kN] M_{xd}/M_{yd} = design value of bending moment [kNm] M_{zd} = design value of torsion moment [kNm]

2. Choose materials and calculation models

- 3. Choose a standard fastening plate or define your own plate
- 4. Define the location of the plate, fixing base and reinforcement
- 5. Choose a standard profile or define your own to be fixed to the fastening plate
- 6. Input the determined design loads
- Calculate the capacity of the fastening plate by clicking the calculator icon
- 8. Check that all utilization degrees are ≤ 1

More information about the PeikPlat from Peikko's technical support.



Peikko

Figure 6. PeikPlat dimensioning software

8. PRODUCTS

8.1 SBKL fastening plates

Plates's dimensions SFS-EN ISO 13920 Class C

Coatings 40 µm protective painting. Available also epoxy painted or galvanized. Manufacturing markings Products are marked with the mark of Inspecta, the emblem of Peikko

Group, the type of the product and date and place of manufacturing.

Approval BY 242 in Finland, ETA-04/0056 (SBKL)

Application With small edge and centre distances surrounded concrete must be reinforced

Permissible stress Capacities are divided by 1,6

Table 3. Materials of the SBKL fastening plate

	plate	standard	anchors	standard
SBKL	S355J2+N*	SFS-EN 10025-2	Ø12-S235J2+N, Ø16-S355J2+N Ø13-S235J2 + C450, Ø16-S235J2 + C450	SFS-EN 10025-2
SBKLR	1.4301*	SFS-EN 10088	Ø12-S235J2+N, Ø16-S355J2+N	SFS-EN 10025-2
SBKLH	1.4401*	SFS-EN 10088	Ø12-S235J2+N, Ø16-S355J2+N	SFS-EN 10025-2
SBKLRr	1.4301*	SFS-EN 10088	Ø12-1.4301*, Ø16-1.4301*	SFS-EN 10088
SBKLHh	1.4401*	SFS-EN 10088	Ø12-1.4401, Ø16-1.4401	SFS-EN 10088
SBKLHr	1.4401*	SFS-EN 10088	Ø12-1.4301*, Ø16-1.4301*	SFS-EN 10088

^{*}other materials has to be asked from Peikko sales

Table 4. Dimensions [mm] and weight [kg] of the SBKL fastening plate

		А	D	Н	а	d	Ø	t	weight
	SBKL 50×100	50	100	68	-	60	12 or 13	8	0.5
- A -	SBKL 100×100	100	100	68	60	60	12 or 13	8	0.9
T	SBKL 100x150	100	150	70	60	90	12 or 13	10	1.5
D d ⊕ ⊕	SBKL 150x150	150	150	162	90	90	12 or 13	12	2.7
	SBKL 100x200	100	200	162	60	120	12 or 13	12	2.5
<u>,</u>	SBKL 200x200	200	200	162	120	120	16	12	4.9
	SBKL 250x250	250	250	165	170	170	16	15	8.6
H V V V	SBKL 100x300	100	300	165	60	180	16	15	4.7
	SBKL 200x300	200	300	165	120	180	16	15	8.2
	SBKL 300x300	300	300	165	180	180	16	15	11.9

 $\textit{Table 5. Capacities N_{Rd}, V_{Rd} [kN], M_{RdD}, M_{RdA}, T_{Rd} [kNm] and minimum fastening area kpa [mm] of the SBKL fastening plate}$

rable 5. Capacities 11 _{Rd} , v _{Rd} (N	7.62 7.63 7.76	N_{Rd}	V_{Rd}	M_RdD	M _{RdA}	T_Rd	minimum kpa
	SBKL 50x100	7.7	9.8	0.38	0.28	0.49	10x50
₩ ₩ MD	SBKL 100x100	13.7	19.3	0.68	0.68	1.38	40x40
$T \rightarrow \left \left(-\frac{N}{A} \right \right $	SBKL 100x150	18.4	19.3	1.20	0.91	1.76	40x60
	SBKL 150x150	39.6	22.6	2.57	2.57	2.10	60×60
	SBKL 100×200	37.2	19.3	2.96	1.86	2.15	40×100
	SBKL 200x200	82.8	43.5	6.62	6.62	4.92	100×100
VTN / MA	SBKL 250×250	91.7	45.0	8.70	8.70	6.00	130x130
<u> </u>	SBKL 100x300	72.3	34.8	7.94	3.61	5.50	40x155
	SBKL 200x300	90.3	43.5	9.94	7.22	6.28	90×150
	SBKL 300x300	98.5	47.5	10.80	10.80	7.38	140×140

Table 4b. Straightness tolerances of SBKL fastening plates [mm].

t _p	SBKL 50x100 SBKL 100x100 SBKL 100x150 SBKL 150x150 SBKL 100x200 SBKL 200x200 SBKL 250x250 SBKL 100x300 SBKL 200x300	t _p Max. 2,5 Max. 2,5 Max. 2,5 Max. 5,0 Max. 2,5 Max. 5,0 Max. 5,0 Max. 5,0 Max. 5,0 Max. 5,0	t _s ±3 ±3 ±3 ±3 ±3 ±3 ±3 ±3
	SBKL 200x300	Max. 5,0	±3
	SBKL 300x300	Max. 5,0	±3

8.2 KL fastening plates

Plates's dimensions SFS-EN ISO 13920 Class C

Coatings 40 µm protective painting. Available also epoxy painted or galvanized. Manufacturing markings Products are marked with the mark of Inspecta, the emblem of Peikko

Group, the type of the product and date and place of manufacturing.

Approval BY 242 in Finland

Application With small edge and centre distances surrounded concrete must be

reinforced

Permissible stress Capacities divided by 1,6

Table 6. Materials of the KL fastening plate

	plate	standard	anchors	standard
KL	S355J2+N*	SFS-EN 10025	A500HW / BSt500S / B500B	SFS 1215 / DIN 488 / EN 10080
KLR	1.4301*	SFS-EN 10088	A500HW / BSt500S / B500B	SFS 1215 / DIN 488 / EN 10080
KLH	1.4401*	SFS-EN 10088	A500HW / BSt500S / B500B	SFS 1215 / DIN 488 / EN 10080

^{*}other materials has to be asked from Peikko sales

Table 7. Dimensions [mm] and weight [kg] of the KL fastening plate

		А	D	Н	а	d	Ø	t	weight
Δ	KL 50×100	50	100	218	-	60	12	8	0.7
- 	KL 100x100	100	100	218	60	60	12	8	1.4
T T 0 0	KL 100x150	100	150	220	60	90	12	10	2.0
D d	KL 150x150	150	150	222	90	90	16	12	3.6
<u> </u>	KL 100x200	100	200	222	60	120	16	12	3.3
,	KL 200×200	200	200	312	120	120	20	12	6.9
t	KL 100x300	100	300	315	60	180	20	15	6.7
H Ø	KL 200x300	200	300	315	120	180	20	15	10.3
<u>-</u>	KL 250x250	250	250	315	150	150	20	15	10.6
	KL 300x300	300	300	315	180	180	20	15	13.9

Table 8. Capacities N_{Rd} , V_{Rd} [kN], M_{RdD} , M_{RdA} , T_{Rd} [kNm] and minimum fastening areas kpa [mm] of the KL fastening plate

Table 6. Capacities 14 _{Rd} , v _{Rd [N]}	1100 1101 110	N_{Rd}	V_{Rd}	M_RdD	M_{RdA}	T_Rd	minimum kpa
г Моп	KL 50×100	7.7	9.8	0.38	0.28	0.49	10x50
Φ Φ NID	KL 100x100	13.7	19.3	0.68	0.68	1.38	40x40
	KL 100x150	18.4	19.3	1.20	0.91	1.76	40x60
	KL 150x150	39.6	22.6	2.57	2.57	2.10	60x60
	KL 100×200	37.2	19.3	2.96	1.86	2.15	40×100
V/N MA	KL 200x200	82.8	43.5	6.62	6.62	4.92	100×100
	KL 100x300	72.3	34.8	7.94	3.61	5.50	40×155
KARAGARA	KL 200x300	90.3	43.5	9.94	7.22	6.28	90×150
	KL 250x250	91.7	45.0	8.70	8.70	6.00	130×130
	KL 300x300	98.5	47.5	10.80	10.80	7.38	140×140

Table 7b. Straightness tolerances of KL fastening plates [mm].

lable /b. Straightness tolerances of KL fastening plates [mm].						
		t _p	t _s			
	KL 50×100	Max. 2,5	±5			
	KL 100×100	Max. 2,5	±5			
-	KL 100x150	Max. 2,5	±5			
	KL 150x150	Max. 5,0	±5			
	KL 100x200	Max. 2,5	±5			
t _p	KL 200x200	Max. 5,0	±8			
t _s	KL 100x300	Max. 2,5	±8			
	KL 200x300	Max. 5,0	±8			
	KL 250x250	Max. 5,0	±8			
	KL 300x300	Max. 5,0	±8			

8.3 JPL fastening plates

Plates's dimensions SFS-EN ISO 13920 Class C

Coatings Sandblasted (SA 2½) and coated A40µm. Available also epoxy painted or

galvanized.

Manufacturing markings Products are marked with the mark of Inspecta, the emblem of Peikko

Group, the type of the product and date and place of manufacturing.

Approval BY 243 in Finland, ETA-04/0056 (JPL)

Application Use when high capacities are needed. With small edge and centre distances

surrounded concrete must be reinforced.

Permissible stress Capacities divided by 1,6

Table 9. Materials of JPL fastening plate

	plate	standard	anchors	standard
JPL	S355J2+N*	SFS-EN 10025	A500HW / BSt500S / B500B	SFS 1215 / DIN 488 / EN 10080
JPLR	1.4301*	SFS-EN 10088	A500HW / BSt500S / B500B	SFS 1215 / DIN 488 / EN 10080
JPLH	1.4401*	SFS-EN 10088	A500HW / BSt500S / B500B	SFS 1215 / DIN 488 / EN 10080

^{*}other materials has to be asked from Peikko sales

Table 10. Dimensions [mm] and weight [kg] of the JPL fastening plate

		А	D	Н	а	d	Ø	t	weight JPL
- A -	JPL 150x150	150	150	220	90	90	16	25	5.9
- 	JPL 150x200	150	200	220	100	120	20	25	8.3
	JPL 200x200	200	200	220	120	120	20	25	10.3
D d	JPL 150x250	150	250	220	100	190	20	25	9.8
	JPL 200x250	200	250	220	120	190	20	25	12.3
	JPL 250x250	250	250	220	190	190	20	25	14.8
H	JPL 200x300	200	300	280	120	200	25	25	16.8
	JPL 300x300	300	300	280	200	200	25	25	22.7
	JPL 400x400	400	400	280	300	300	25	30	43.0
	JPL 500x500	500	500	280	400	400	25	30	64.6
	JPL 600x600	600	600	280	500	500	25	30	91.0

Table 11. Capacities N_{Rd} , V_{Rd} [kN], M_{RdD} , M_{RdA} , T_{Rd} [kNm] and minimum fastening areas kpa [mm] of the JPL fastening plate

Table 11. Capacities N _{Rd} , V _{Rd} IN	nub nua	N _{Rd}	V _{Rd}	M _{RdD}	M_{RdA}	T _{Rd}	minimum kpa S355	minimum kpa 1.4301/1.4401
	JPL 150x150	177	61	15.1	15.1	4.8	60×60	87x87
	JPL 150x200	295	96.7	31.4	23.6	8.9	115x70	133x94
	JPL 200x200	314	100.4	31.4	31.4	10.0	115x115	133x133
	JPL 150x250	316	101	49.7	23.6	12.5	185x55	203x84
	JPL 200x250	339	103	49.7	31.4	13.3	170x85	194×114
V N MA	JPL 250x250	369	107	49.7	49.7	15.9	155x155	184x184
	JPL 200x300	533	161	81.8	49.1	21.6	202×102	217x125
	JPL 300x300	584	168	81.8	81.8	26.2	182x182	205x205
	JPL 400x400	646	173	123	123	39.3	230×230	273x273
	JPL 500x500	682	176	164	164	52.3	302x302	356x356
	JPL 600x600	705	178	205	205	65.4	374x374	439x439

Table 10b. Straightness tolerances of JPL fastening plates [mm].

table 10b. Straightness tolerances of JPL fastening plates [mm].						
		t _p	t _s			
	JPL 150x150	Max. 5,0	±5			
	JPL 150x200	Max. 5,0	±5			
	JPL 200×200	Max. 5,0	±5			
	JPL 150×250	Max. 5,0	±5			
	JPL 200x250	Max. 5,0	±5			
t_p $\bigg] \bigg[- \frac{1}{2} \bigg] \bigg] \bigg[- \frac{1}{2} \bigg] \bigg] \bigg[- \frac{1}{2} \bigg[- \frac{1}{2} \bigg[- \frac{1}{2} \bigg] \bigg] \bigg[- \frac{1}{2} \bigg[- \frac{1}{2} \bigg[- \frac{1}{2} \bigg[- \frac{1}{2} \bigg] \bigg] \bigg] \bigg[- \frac{1}{2} \bigg[- $	JPL 250x250	Max. 5,0	±5			
t_{s}	JPL 200x300	Max. 5,0	±8			
-~ ▶! . ∢-	JPL 300x300	Max. 5,0	±8			
	JPL 400×400	Max. 5,0	±8			
	JPL 500x500	Max. 9,0	±8			
	JPL 600×600	Max. 9,0	±8			

8.4 PKL, P2KL and P3KL fastening plates

Installation tolerance ± 15 mm ± 3° Pitch of the anchors Mutual location of the anchors ± 5 mm Total height ± 5 mm

Plates's dimensions SFS-EN ISO 13920 Class C

Coatings Sandblasted (SA 2½) and coated A40µm.

Manufacturing markings Products are marked with the mark of Inspecta, the emblem of Peikko

Group, the type of the product and date and place of manufacturing.

BY 230 in Finland, ETA-04/0056 (PKL) Approval Application Prefer length multiplied with c/c.

Capacities divided by 1,6 Permissible stress

K30-2 Nominal strength of concrete

Table 12. Materials of the long fastening plates

	plate	standard	anchors	standard
PKL / P2KL / P3KL	S355J2+N*	SFS-EN 10025	Ø12-S235J2+N, Ø16-S355J2+N, Ø16-S355J2+C450, Ø20-S355J2+N	SFS-EN 10025
PKLR / P2KLR / P3KLR	1.4301*	SFS-EN 10088	Ø12-S235J2+N, Ø16-S355J2+N, Ø20-S355J2+N	SFS-EN 10025
PKLH / P2KLH / P3KLH	1.4401*	SFS-EN 10088	Ø12-S235J2+N, Ø16-S355J2+N, Ø20-S355J2+N	SFS-EN 10025

^{*}Contact our sales for other materials

Table 13. Dimensions [mm], weight [~kg/m] and welding of the headed studs of the long fastening plates

	A H		А	а	Н	Ø	t	c/c	weight	weld
PKL	A H t 100	PKL 100	100	50	70	12	10	150	9	surface
P2KL	* *	PKL 150	150	90	70	12	10	150	13	surface
	● ●	PKL 200	200	100	70	12	10	150	17	surface
		P2KL 100	100	50	115	16	15	200	14	hole*
	└─	P2KL 150	150	90	115	16	15	200	20	hole*
	ΑΗ	P2KL 200	200	100	115	16	15	200	26	hole*
P3KL	a	P2KL 300	300	200	115	16	15	200	38	hole*
	100 c/c	P2KL 400	400	200	115	16	20	200	66	hole
		P3KL 300	300	200	220	20	25	200	68	hole
		P3KL 400	400	300	220	20	25	200	88	hole
	, j	P3KL 500	500	400	220	20	25	200	108	hole
		P3KL 600	600	500	220	20	25	200	128	hole

^{*} Welding on the surface possible

minimum N_{Rd}^* V_{Rd1} * V_{Rd2} * kpa* PKL 100 15.2 13.4 14.4 84x25 PKL 150 22.7 13.8 14.4 54x28 PKL 200 24.4 14.4 40x31 13.9 P2KL 100 35.6 24.8 24.9 135x5 P2KL 150 44.4 24.8 25.0 125x30 P2KL 200 45.7 24.8 25.0 110x50 P2KL 300 53.3 25.4 90x90 24.8 P2KL 400 53.3 24.8 25.4 90x90 P3KL 300 143.5 56.8 57.6 120x120 56.8 58.3 P3KL 400 143.5 120x120 P3KL 500 143.5 56.8 59.1 80x140 P3KL 600 143.5 56.8 59.7 60x140

Table 14. Capacities [kN] and minimum fastening areas kpa [mm] of the long fastening plates

Table 13b. Straightness tolerances of PKL, P2KL and P3KL fastening plates [mm].

		t _p lengthwise	t _p widthwise	t _s
	PKL 100	Max. 14,0	Max. 2,5	±3
	PKL 150	Max. 14,0	Max. 5,0	±3
	PKL 200	Max. 14,0	Max. 5,0	±3
	P2KL 100	Max. 14,0	Max. 2,5	±3
	P2KL 150	Max. 14,0	Max. 5,0	±3
$t_p^{ op}$	P2KL 200	Max. 14,0	Max. 5,0	±3
	P2KL 300	Max. 14,0	Max. 5,0	±3
<u>t_s</u> ↓	P2KL 400	Max. 14,0	Max. 5,0	±3
	P3KL 300	Max. 14,0	Max. 5,0	±5
	P3KL 400	Max. 14,0	Max. 5,0	±5
	P3KL 500	Max. 14,0	Max. 9,0	±5
	P3KL 600	Max. 14,0	Max. 9,0	±5

^{*} Long fastening plates (PKL, P2KL ja P3KL) capacities are per one row of anchors.

8.5 Fastening angle bars

Location of the anchors ± 5 mm

Plates's dimensions SFS-EN ISO 13920 Class C

Coatings Sandblasted (SA 2½) and coated A40µm. Available also epoxy painted or

galvanized.

Manufacturing markings Products are marked with the mark of Inspecta, the emblem of Peikko

Group, the type of the product and date and place of manufacturing.

Approval BY 230 (KKT) in Finland

Application KS corner protector; to protect chamfered corners of columns.

SKT anchor for inner corners; to bear for example channels.

UKT anchor for outer corners; to e.g. corners of stairs and expansion joints.

KKT; for load bearing corner fastening.

Permissible stress Capacities divided by 1,6

Table 15. Materials of the fastening angle bars

	KKT	KKTR	KKTH	UKT, SKT, KS, RLRK	KSR	KSH	UKTR, SKTR	UKTH, SKTH
angle	S235JR	1.4301	1.4401	S235JR	1.4301	1.4401	1.4301	1.4401
anchors	S235J2+N	S235J2+N	S235J2+N	A500HW	A500HW	A500HW	B600KX	B600KX

Table 16. Dimensions [mm] and weight [~kg/m] of the fastening angle bars

Support for abaquared plata		profile	Ø	c/c	Н	weight
Support for chequered plate RLRK KS 20, 30, 17 21, 18, 22	Support for chequered plate RLRK	see fig.	6	300	-	5.0
	Corner protector KS	60x60x4	8	400	-	4.0
	SKT 50	50x50x5	6	300	-	4.2
UKT KKT 50 - KKT 80 H C/C	UKT 50	50x50x5	6	300	-	4.2
	UKT 60	60x60x6	6	300	-	5.9
	UKT 80	80x80x8	6	300	-	10.2
	UKT 100	100×100×10	6	300	-	16.0
SKT KKT 100	UKT 100x50	100x50x8	6	300	-	9.6
	KKT 50	50x50x5	12	250	160	5.3
c/c H C/c C/c	KKT 80	80x80x8	12	250	160	11.2
(K)	KKT 100	100×100×10	16	200	120	18.0

Table 17. Capacities of the fastening angle bars [kN] (acc. to the Finnish Code of Building Regulations). Capacities are per one row of anchors.

	KKT 50	KKT 80	KKT 100
N_{Rd}	14.6	14.6	26.0
V_{Rd}	16.3	16.3	28.7





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