



## KK LIFTING SYSTEM



Version EN-7/2009  
Replaces brochure 2/2007

# KK LIFTING SYSTEM



## Benefits of KK lifting system

### KK

- Rapid coupling system
- Economical solution
- Wide range of anchors types

**For technical support, contact local Peikko Sales office or by email [lifting.systems@peikko.com](mailto:lifting.systems@peikko.com)**



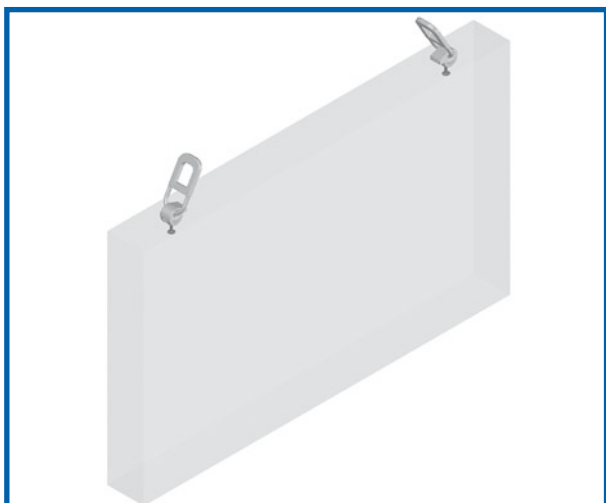
**CONCRETE CONNECTIONS**

### 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

# KK LIFTING ANCHOR

The KK anchors are used for lifting of different precast components, like beams, slabs and pipes, where a rapid coupling lifting system is suitable.



KK anchor is installed in the concrete with a hemispherical recess former. This allows a direct transfer of the horizontal force into the concrete via the T-spherical head during diagonal pull.

Lifting anchors shall be covered and protected against corrosion for example with mortar layer – otherwise cracking of the concrete or surface soiling due to anchor corrosion might occur.

## Available types:

KK	untreated
KKZ	hot dip galvanized
KKG	zinc plated (upon order)
KKS	stainless steel (upon order)

<b>Material</b>	S355J0	EN 10025
	S355J2	EN 10025
	1.0577	EN 10025

Untreated KK anchors are recommended to use in concrete elements for dry internal areas.

Hot dipped galvanized KKZ anchors (layer thickness  $\geq 45 \mu\text{m}$ ) can also be used in internal spaces with moisture and in external areas.

## Ordering example KKZ 5x85:

KK for KK –anchor  
Z for hot dip galvanized treatment  
5x85 for 5 tn load class and length 85 mm

Table 1. Available sizes

Load class	Length	Type, untreated	Type, HDG		Packing size
1.3	65	KK	KKZ	1.3x65	100
	85	KK	KKZ	1.3x85	100
	120	KK	KKZ	1.3x120	100
2.5	65	KK	KKZ	2.5x65	100
	85	KK	KKZ	2.5x85	100
	120	KK	KKZ	2.5x120	100
	140	KK	KKZ	2.5x140	50
	170	KK	KKZ	2.5x170	50
	280	KK	KKZ	2.5x280	50
4	75	KK	KKZ	4x75	50
	95	KK	KKZ	4x95	50
	120	KK	KKZ	4x120	50
	210	KK	KKZ	4x210	25
	240	KK	KKZ	4x240	25
	340	KK	KKZ	4x340	25
5	75	KK	KKZ	5x75	100
	85	KK	KKZ	5x85	100
	95	KK	KKZ	5x95	50
	120	KK	KKZ	5x120	50
	180	KK	KKZ	5x180	50
	240	KK	KKZ	5x240	50
7.5	340	KK	KKZ	5x340	10
	100	KK	KKZ	7.5x100	25
	120	KK	KKZ	7.5x120	25
	160	KK	KKZ	7.5x160	25
10	300	KK	KKZ	7.5x300	10
	120	KK	KKZ	10x120	10
15	340	KK	KKZ	10x340	10
	200	KK	KKZ	15x200	1
20	300	KK	KKZ	15x300	1
	400	KK	KKZ	15x400	1
32	200	KK	KKZ	20x200	1
	500	KK	KKZ	20x500	1
32	500	KK	KKZ	32x500	1

Other sizes also available, please contact local Peikko Sales Office for details.

For choosing the correct size for the Anchor, please check the basics of taking into account factors like mould adhesion, statical system, lifting angle and dynamic forces from General Installation Instructions -brochure.

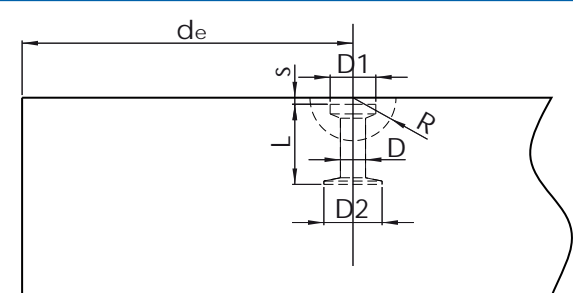


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## Edge distances and allowed loads for KK anchors

For slab and wall units the value for edge distance ( $d_e$ ) of the KK Anchor is  $3x(L+s)$ .

Table 2. Important dimensions



The diagram shows a cross-section of a concrete slab with a KK anchor. The anchor has a main body of diameter D and two end caps of diameter D1 and D2. The distance from the end of the anchor to the edge of the slab is d\_e. The anchor is shown at an angle R. The immersion length s is the distance from the end of the anchor to the center of the main body. The total length of the anchor is L.

Load Class	D	D1	D2	R	s	Immersion length	Minimum edge distance $d_e$
1.3	10	19	25	30	10	10	250
2.5	14	26	35	37	11	11	350
4.0	18	36	45	47	15	15	675
5.0	20	36	50	47	15	15	765
7.5	24	47	60	59	15	15	945
10	28	47	70	59	15	15	1100
15	34	70	80	80	15	15	1250
20	39	70	98	80	15	15	1550
32	50	88	135	107	23	23	2150

Smaller edge distances are possible but will cause a loss of bearing capacity and should be avoided.

All given capacities are based on following safety factors:

- Safety against concrete failure : 2,5
- Safety against anchor material failure : 3

User should check the capacities according to local requirements of safety factors. The anchor will hold with the required reinforcement, but the designer has to consider the strenght of the whole element during transport, lifting and erection.

**Note:** Horizontally cast wall panels shall be lifted into a vertical position ( $\geq 70^\circ$  from horizontal) with a tilting table. If panels must be lifted from horizontal position with lifting anchors, using of Peikko JENKA or RR - system is recommended.

Table 3. Examples of load capacities for beams and wall panels in lifting angles from  $0^\circ$  to  $45^\circ$

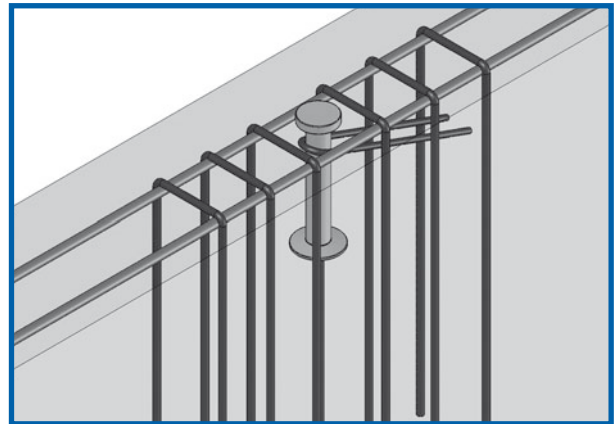
Load class	Precast component minimum thickness, mm	Minimum anchor length	Max loading, kN with concrete compressive strength
			15 MPa
1.3	100	120	13
2.5	120	170	25
4.0	160	210	40
5.0	180	240	50
7.5	240	300	75
10	260	340	100
15	280	400	150
20	280	500	200

**Note:** Loading Class, and allowed load are different with short anchors. For short anchors, which are used in slabs, allowed loads are limited to values given on the next page.

Table 4. Examples of loading capacities for lifting slabs for all lifting angles and –directions

Anchor type	Slab thickness mm	Mesh reinforcement mm <sup>2</sup>	Max Load, kN Concrete compression strength 15 MPa
KK1.3x55	85	131	7
KK1.3x65	100	131	10
KK1.3x85	120	131	13
KK2.0x85	110	131	19
KK2.5x55	90	131	9
KK2.5x65	100	131	13
KK2.5x85	120	131	20
KK2.5x120	155	131	25
KK4.0x75	115	221	18
KK4.0x100	140	221	29
KK4.0x170	210	221	40
KK5.0x95	145	221	23
KK5.0x120	160	221	32
KK5.0x180	220	221	50
KK7.5x100	140	378	25
KK7.5x120	165	378	38
KK7.5x165	190	378	55
KK7.5x200	240	378	75
KK10x115	155	378	35
KK10x150	190	378	51
KK10x170	210	378	55
KK10x250	290	513	100
KK15x165	205	513	55
KK15x300	340	513	150
KK20x200	240	513	75
KK20x250	290	513	100
KK20x300	340	513	150

## Necessary reinforcement for axial and diagonal lifting



It is necessary in beams and wall panels to have the following reinforcement:

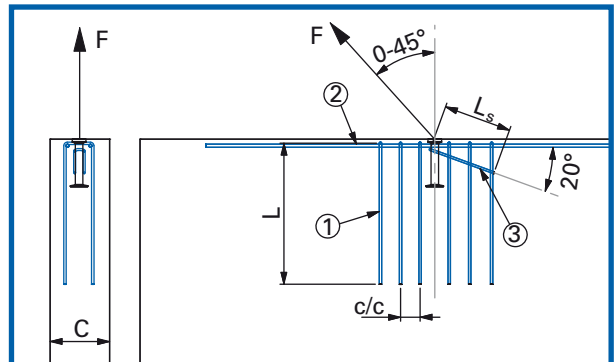


Table 5. Reinforcement for axial lifting, walls and beams

Load class	Mesh reinforcement on both surfaces, mm <sup>2</sup>	Anchor Stirrups (1)	Edge reinforcement (2)
1.3	131	6 Ø 8 L 600 c/c 100	2 Ø 10
2.5	131	6 Ø 8 L 600 c/c 100	2 Ø 10
4	131	6 Ø 8 L 600 c/c 100	2 Ø 10
5	131	6 Ø 8 L 600 c/c 100	2 Ø 10
7.5	221	6 Ø 8 L 600 c/c 125	2 Ø 10
10	257	6 Ø 8 L 1000 c/c 125	2 Ø 14
15	378	8 Ø 10 L 1000 c/c 125	2 Ø 14
20	513	8 Ø 10 L 1000 c/c 125	2 Ø 14
32	2 x 513	8 Ø 10 L 1000 c/c 125	2 Ø 14

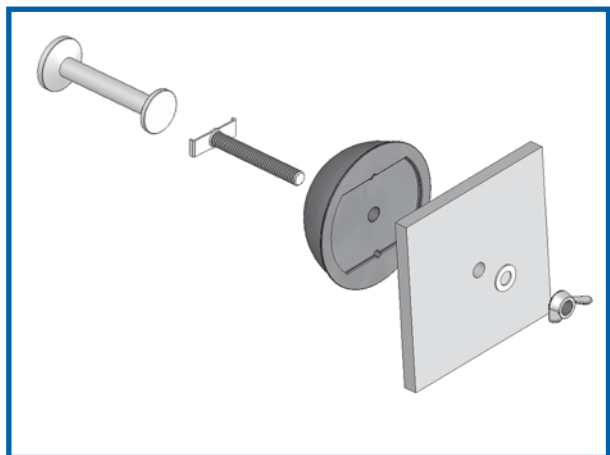
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Table 6. Additional reinforcement loop for lifting angles 10 – 45°

Load class	Diagonal pull reinforcement (3)	Leg length (Ls)	Loop bending diameter, mm
1.3	Ø 8	200	32
2.5	Ø 10	300	40
4	Ø 12	400	40
5	Ø 14	450	56
7.5	Ø 16	600	64
10	Ø 20	600	140
15	Ø 25	750	175
20	Ø 25	950	175
32	2 Ø 25	1000	175

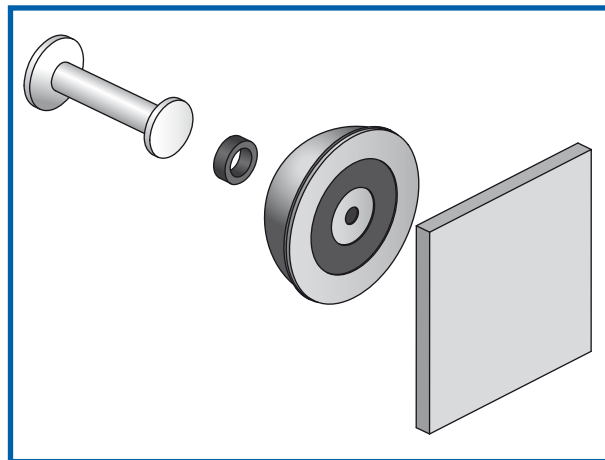
## Installation of KK anchors

The spherical-head KK anchors are installed into the mould by using Peikko® KRC hemispherical recess formers.



The recess former retains the anchor in position during the concreting. Recess former creates a recess for Peikko® KKL lifting clutch, which are compatible with same load class KK anchors.

For steel moulds; Peikko offer magnetic steel recess former KMG



## Lifting

### KKL Lifting clutch

Each KKL clutch has identification markings on the handle: name of the manufacturer, the load group and an operating icon. The clutch head is marked with the load group.

KKL clutch has safety factor of 4 against material failure.



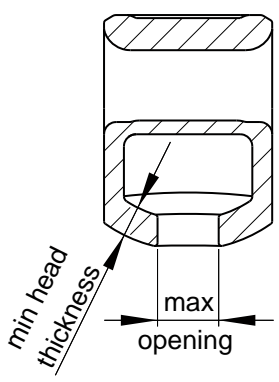
## Inspecting the KKL clutch:

KK Clutches must be inspected once a year by a competent person. If any defects are visible or suspected, please contact our lifting systems technical support to check if the clutch can be used, or scrap the Lifting Device.

The user has to ensure that the KK Clutches are inspected once a year, and that the test results has been documented. As well as any deformations, it is important that wear and tear is determined. The lettering and identification of the clutch must be visible.

If the max opening and minimum head thickness are outside given values, using the KK Clutch is not safe.

Table 7. Limiting dimensions

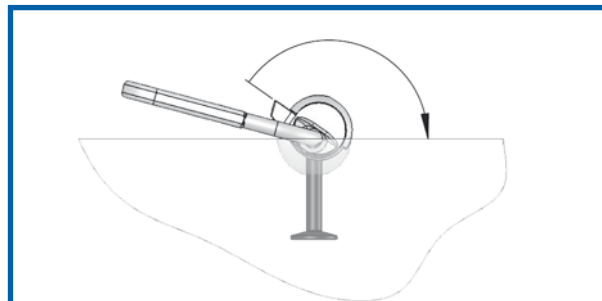
		
Clutch class, tn	Max opening, mm	Min head thickness, mm
1-1.3	≤13	≥5,5
2.5	≤18	≥6
4.0-5.0	≤25	≥8
7.5-10.0	≤32	≥12
15-20.0	≤46	≥18
32.0	≤58	≥24

Inspections mentioned above must be documented and measured values recorded, and in case of any failure these reports must be available to be presented.

**Note:** Any modifications or repairs to the KK Lifting Clutches, especially welding operations, are strictly forbidden in order to minimize risks in lifting.

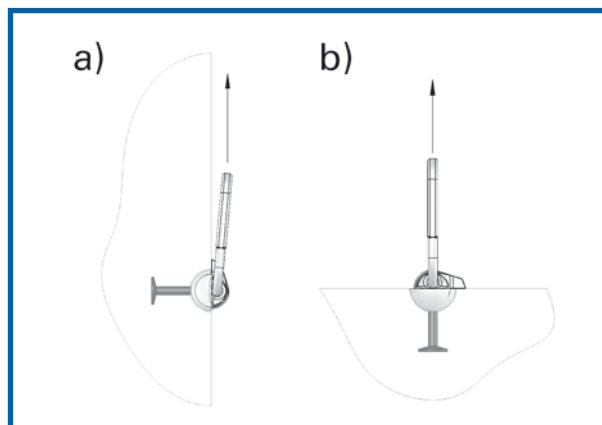
## Operating instructions:

### Connecting



To connect the clutch to the anchor, the head is pushed with its opening facing downwards over the anchor. The latch of the head is then turned downwards. The Lifting Head sits in the recess and is now ready for use. Remember to check that the clutch is for the same load class than the anchor in use.

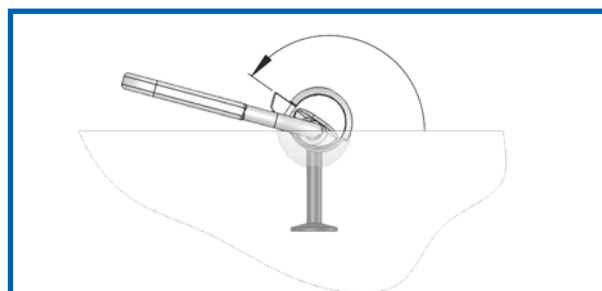
### Lifting



Now, the precast element can be lifted. Tilting, turning and swivelling of the concrete unit in motion is allowed and safe with the KKL Lifting Clutch.

While turning the element with the KKL Lifting Clutch, the latch must be in the correct position pointing to the pulling direction.

### Release



To release, lifting chains are released and the head is turned up and clutch is pulled out.



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