

## AKR-Z Kulmalevyt AKR ZPRO

*These brackets allow optimum connection between wood and other building materials such as concrete and steel. This is an economic connection that can be used in many areas. The types AKR and AKR-L differ in having either a hole or an oblong hole for the bolt, in the smaller flange.. AKR bracket is 3 mm thick and the edges are reinforced with rib.*

## Ominaisuudet

### Material

#### **Steel:**

**S250GD + ZPRO**

#### **Corrosion protection:**

**ZPRO coating - corresponding to a zinc layer of approx. 55 µm**

### Benefits

- Load capacity in all directions
- Optimized capacities for partnailing and fullnailing
- One- or two-sided connections
- Possible mounting with distance from the support at tension connections
- Optimized bolt utilization

## Sovellus

### Applications

#### **Supporting member:**

- Concrete, steel

#### **Supported member:**

- Solid wood, engineered wood

### When to use

- The AKR brackets allow optimum connection between wood and other building materials such as concrete and steel.
- **According to their overall ZPRO surface the AKR-Z angle brackets could be used in outdoor areas**



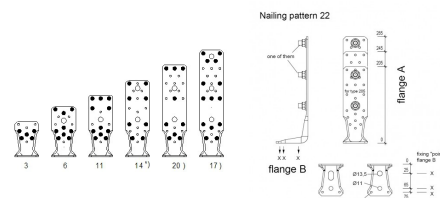
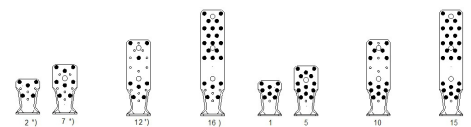
AKR95Z



AKR135Z



AKR265LZ



AKR-Z  
Kulmalevyt AKR ZPRO

## Technical Data

Mitat ja ominaisarvot

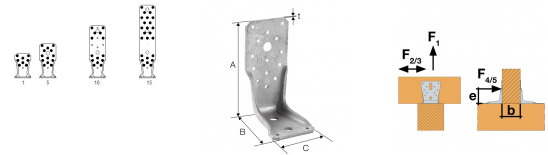


Tuotenro	Mitat ja ominaisarvot [mm]				Holes flange A		Holes flange B			
	A	B	C	t	Ø5	Ø13.5	Ø5	Ø11	Ø13.5	Ø13.5x25
AKR95Z	95	85	65	3	9	-	2	1	1	-
AKR95LZ	95	85	65	3	9	-	2	1	-	1
AKR135Z	135	85	65	3	14	1	2	1	1	-
AKR135LZ	135	85	65	3	14	1	2	1	-	1
AKR285Z	285	85	65	3	26	3	2	1	1	-
AKR285LZ	285	85	65	3	26	3	2	1	-	1

Below you will find load details to the nail pattern: fullnailing, partnailing and post connection. Further connection options, see the corresponding ETA.

## AKR-Z Kulmalevyt AKR ZPRO

Characteristic capacities - Full nailing



Tuotenro	Product capacities - Timber to timber - Full nailing											
	Litoskiinnikkeet				Nail pattern	Characteristic capacities - Timber C24 - 2 angle brackets per connection [kN]						
	Flange A		Flange B			R <sub>1,k</sub>			R <sub>2,k</sub> = R <sub>3,k</sub>			R <sub>4,k</sub> = R <sub>5,k</sub>
	Qty	Type	Qty	Type		CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40/50/60
AKR95Z	8	CNA*	1	Ø12*	1	min (17.55 ; 25.04/kmod + 13.2)	min (22.64 ; 25.04/kmod + 17.6)	min (26.48 ; 25.04/kmod + 22)	5	6.2	6.9	15.75 / kmod
AKR95LZ	8	CNA*	1	Ø12**	1	min (13.31 ; 25.04/kmod + 8.92)	min (17.4 ; 25.04/kmod + 11.89)	min (20.89 ; 25.04/kmod + 14.87)	4.4	5.6	6.4	-
AKR135Z	13	CNA*	1	Ø12**	5	min (31.78 ; 25.04/kmod + 8.69)	min (40.69 ; 25.4/kmod + 11.58)	min (46.92 ; 25.04/kmod + 14.48)	8	10.1	11.2	15.75 / kmod
AKR135LZ	13	CNA*	1	Ø12**	5	min (24.88 ; 25.04/kmod + 5.87)	min (32.34 ; 25.4/kmod + 7.83)	min (38.36 ; 25.04/kmod + 9.78)	7.2	9.1	10.4	-
AKR285Z	25	CNA*	1	Ø12**	15	min (45.25 ; 25.04/kmod + 8.69)	min (58.98 ; 25.04/kmod + 11.58)	min (70.31 ; 25.04/kmod + 14.48)	8.9	11.6	14.1	15.75 / kmod
AKR285LZ	25	CNA*	1	Ø12**	15	min (32.96 ; 25.04/kmod + 5.87)	min (43.42 ; 25.04/kmod + 7.83)	min (52.87 ; 25.04/kmod + 9.78)	6.6	8.7	10.7	-

\* Refer to Characteristic Capacity table columns for type of fasteners that can be used in Flange A. Capacities vary depending on fastener type used.

\*\* The bolt design resistance requirement R<sub>#,d</sub> is determined from (bolt factor x connection design load F<sub>#,d</sub>) for the required load direction and fastener. Refer to the Simpson Strong-Tie anchor product range for suitable anchors. Typical anchor solutions depend on the concrete type, spacing and edge distances.

Factor for bolt calculation at 2 AKR connections

Load direction	k <sub>ax</sub>	k <sub>lat</sub>
F <sub>1</sub> Bolt 1 and 2	0,5	0
F <sub>2/3</sub> Bolt 1 and 2	0,2	0,5
F <sub>4/5</sub> Bolt 1 from F <sub>1,d</sub>	1	0
F <sub>4/5</sub> Bolt 2	0,5	1

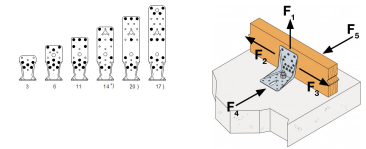
For load direction F<sub>4/5</sub> applies: An additional tensile load (F<sub>1,d</sub>) must be received and verified for the left AKR, and for both bolts.

$$F_{1,d}^* = \frac{F_{4/5,d} \times (e - 16,5mm)}{b + 83mm}$$

Combined load:

$$\sqrt{\left(\frac{F_{1,d}}{R_{1,d}} + \frac{F_{4/5,d}}{R_{4/5,d}}\right)^2 + \left(\frac{F_{2/3,d}}{R_{2/3,d}}\right)^2} \leq 1$$

## AKR-Z Kulmalevyt AKR ZPRO



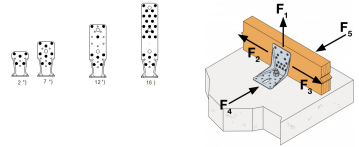
### Characteristic capacities - Partial nailing

Tuotenro	Product capacities - Timber to timber - Partial nailing											
	Litoskiinnikkeet				Nail pattern	Characteristic capacities - Timber C24 - 2 angle brackets per connection [kN]						
	Flange A		Flange B			R <sub>1,k</sub>			R <sub>2,k</sub> = R <sub>3,k</sub>			R <sub>4,k</sub> = R <sub>5,k</sub>
	Qty	Type	Qty	Type		CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40/50/60
AKR95Z	5	CNA*	1	Ø12**	3	min (10.3 ; 25.04/kmod + 12.62)	min (13.34 ; 25.04/kmod + 16.82)	min (15.72 ; 25.04/kmod + 21.04)	3.2	4	4.5	15.75 / kmod
AKR95LZ	5	CNA*	1	Ø12**	3	min (7.7 ; 25.04/kmod + 8.52)	min (10.1 ; 25.04/kmod + 11.36)	min (12.18 ; 25.04/kmod + 14.22)	2.9	3.6	4.1	-
AKR135Z	9	CNA*	1	Ø12**	6	min (21.19 ; 25.04/kmod + 8.69)	min (27.21 ; 25.04/kmod + 11.58)	min (31.54 ; 25.04/kmod + 11.58)	5.9	7.5	8.4	15.75 / kmod
AKR135LZ	9	CNA*	1	Ø12**	6	min (16.39 ; 25.04/kmod + 5.87)	min (21.35 ; 25.04/kmod + 7.83)	min (25.45 ; 25.04/kmod + 9.78)	5.2	6.6	7.6	-
AKR285Z	14	CNA*	1	Ø12**	17	min (27.93 ; 25.04/kmod + 3.93)	min (36.23 ; 25.04/kmod + 5.24)	min (42.8 ; 25.04/kmod + 6.55)	5.5	7.3	8.8	15.75 / kmod
AKR285LZ	14	CNA*	1	Ø12**	17	min (20.71 ; 25.04/kmod + 2.66)	min (27.2 ; 25.04/kmod + 3.54)	min (32.91 ; 25.04/kmod + 4.43)	4.1	5.5	6.7	-

\* Refer to Characteristic Capacity table columns for type of fasteners that can be used in Flange A. Capacities vary depending on fastener type used.

\*\* The bolt design resistance requirement R<sub>#,d</sub> is determined from (bolt factor x connection design load F<sub>#,d</sub>) for the required load direction and fastener. Refer to the Simpson Strong-Tie anchor product range for suitable anchors. Typical anchor solutions depend on the concrete type, spacing and edge distances.

## AKR-Z Kulmalevyt AKR ZPRO



### Characteristic capacities - Post connection

Tuotenro	Product capacities - Timber C24 - column											
	Litoskiinnikkeet				Nail pattern	Characteristic capacities - Timber C24 - 2 angle brackets per connection [kN]						
	Flange A		Flange B			R <sub>1,k</sub>			R <sub>2,k</sub> = R <sub>3,k</sub>			R <sub>4,k</sub> = R <sub>5,k</sub>
	Qty	Type	Qty	Type		CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40/50/60
AKR95Z	5	CNA*	1	Ø12**	2	min (11.5 ; 25.04/kmod + 5.97)	min (14.78 ; 25.04/kmod + 7.97)	min (17.19 ; 25.04/kmod + 9.96)	3.5	4.4	5	15.75 / kmod
AKR95LZ	5	CNA*	1	Ø12**	2	min (8.83 ; 25.04/kmod + 4.04)	min (11.52 ; 25.04/kmod + 5.38)	min (13.76 ; 25.04/kmod + 6.73)	3.1	3.9	4.5	-
AKR135Z	8	CNA*	1	Ø12**	7	min (20.49 ; 25.04/kmod + 3.93)	min (26.13 ; 25.04/kmod + 5.24)	min (29.94 ; 25.04/kmod + 6.55)	5.6	7	7.9	15.75 / kmod
AKR135LZ	8	CNA*	1	Ø12**	7	min (16.31 ; 25.04/kmod + 2.66)	min (21.13 ; 25.04/kmod + 3.54)	min (24.91 ; 25.04/kmod + 4.43)	4.9	6.2	7.1	-
AKR285Z	22	CNA*	1	Ø12**	16	min (41.66 ; 25.04/kmod + 3.93)	min (54.19 ; 25.04/kmod + 5.24)	min (64.34 ; 25.04/kmod + 6.55)	5.8	7.6	9.3	15.75 / kmod
AKR285LZ	22	CNA*	1	Ø12**	16	min (30.58 ; 25.04/kmod + 2.66)	min (40.23 ; 25.04/kmod + 3.54)	min (48.85 ; 25.04/kmod + 4.43)	4.2	5.6	6.9	-

\* Refer to Characteristic Capacity table columns for type of fasteners that can be used in Flange A. Capacities vary depending on fastener type used.

\*\* The bolt design resistance requirement R<sub>#,d</sub> is determined from (bolt factor x connection design load F<sub>#,d</sub>) for the required load direction and fastener. Refer to the Simpson Strong-Tie anchor product range for suitable anchors. Typical anchor solutions depend on the concrete type, spacing and edge distances.

AKR-Z

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## Asennus

### Fasteners

- The fixing needs to be done with CNA4,0xl threaded nails or CSA5,0xl screws. On concrete or steel by an wedge anchor M12 and a washer Ø24.
- It is possible to single or double sided connections.

