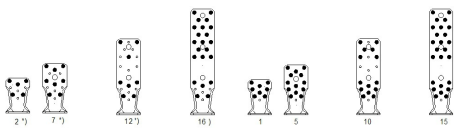
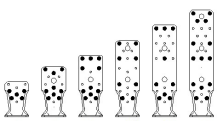
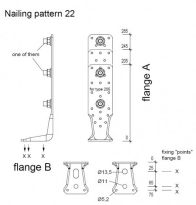
Technical data sheet

AKR-Z
Angle bracket

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.







Features

Material

<u>Steel:</u>
S250GD + ZPRO
<u>Corrosion protection:</u>
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

Applications

Applications

<u>Supporting member:</u>

- Concrete, steel

<u>Supported member:</u>

- 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**

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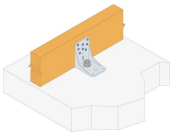
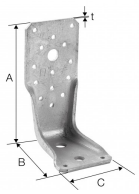
Technical Data





Product Dimensions

References	Tun / DB nr.	NOB nr.	Product Dimensions [mm]				Holes flange A		Holes flange B				Box Quantity	Weight [kg]
			A	B	C	t	Ø5	Ø13.5	Ø5	Ø11	Ø13.5	Ø13.5x25		
AKR95Z	2048459	55360544	95	85	65	3	9	-	2	1	1	-	25	0.24
AKR95LZ	2048462	55360563	95	85	65	3	9	-	2	1	-	1	25	0.24
AKR135Z	2048465	55360578	135	85	65	3	14	1	2	1	1	-	25	0.3
AKR135LZ	2048466	55360616	135	85	65	3	14	1	2	1	-	1	25	0.3
AKR285Z	2048467	55360620	285	85	65	3	26	3	2	1	1	-	25	0.56
AKR285LZ	2048468	55360635	285	85	65	3	26	3	2	1	-	1	25	0.5

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

Technical data sheet

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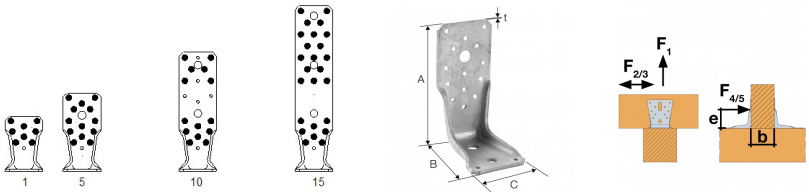
Characterisitic capacities - Full nailing



References	Product capacities - Timber to timber - Full nailing											
	Number of Fasteners				Nail pattern	Characteristic capacities - Timber C24 - 2 angle brackets per connection [kN]						
	Flange A		Flange B			$R_{1.k}$			$R_{2.k} = R_{3.k}$			$R_{4.k} = R_{5.k}$
	Qty	Type	Qty	Type		CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40/50/60
AKR95Z	8	CNA*	1	M12**	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	M12**	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	M12**	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	M12**	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	M12**	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	M12**	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 $R_{\#,d}$ is determined from (bolt factor x connection design load $F_{\#,d}$) 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_{ax}	k_{lat}
F_1 Bolt 1 and 2	0,5	0
$F_{2/3}$ Bolt 1 and 2	0,2	0,5
$F_{4/5}$ Bolt 1 from $F_{1,d}$	1	0
$F_{4/5}$ Bolt 2	0,5	1

For load direction F4/5 applies: An additional tensile load ($F_{1,d}$) must be received and verified for the left AKR, and for both bolts.

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

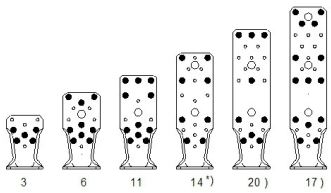
Combined load:

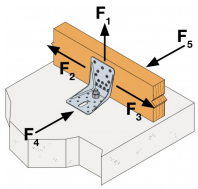
$$\sqrt{\left(\frac{F_{1,d}}{R_{1,d}} + \frac{F_{4/5,d}}{R_{4/5,d}}\right)^2 + \left(\frac{F_{2/3,d}}{R_{2/3,d}}\right)} \leq 1$$

Technical data sheet

AKR-Z
Angle bracket

Characteristic capacities - Partial nailing





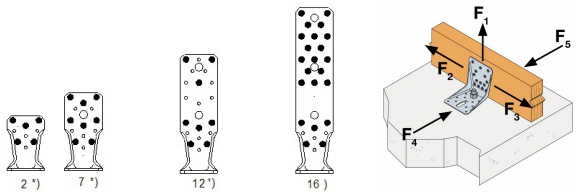
References	Product capacities - Timber to timber - Partial nailing											
	Number of Fasteners				Nail pattern	Characteristic capacities - Timber C24 - 2 angle brackets per connection [kN]						
	Flange A		Flange B			$R_{1.k}$			$R_{2.k} = R_{3.k}$			$R_{4.k} = R_{5.k}$
	Qty	Type	Qty	Type		CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40/50/60
AKR95Z	5	CNA*	1	M12**	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	M12**	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	M12**	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	M12**	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	M12**	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	M12**	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#,d is determined from (bolt factor x connection design load F#,d) 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.

Technical data sheet

AKR-Z
Angle bracket

Characteristic capacities - Post connection



References	Product capacities - Timber C24 - column											
	Number of Fasteners				Nail pattern	Characteristic capacities - Timber C24 - 2 angle brackets per connection [kN]						
	Flange A		Flange B			$R_{1.k}$			$R_{2.k} = R_{3.k}$			$R_{4.k} = R_{5.k}$
	Qty	Type	Qty	Type		CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40/50/60
AKR95Z	5	CNA*	1	M12**	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	M12**	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	M12**	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	M12**	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	M12**	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	M12**	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#,d is determined from (bolt factor x connection design load F#,d) 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.

Installation

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.

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