Technical 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.







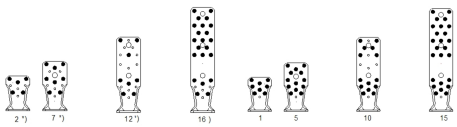
AKR95Z

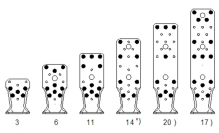


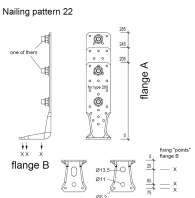
AKR135Z



AKR285LZ







Features

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

Applications

Applications

Supporting member:

- Concrete, steel

Supported member:

- Solid wood, engineered wood

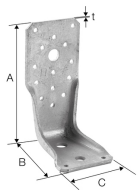
When to use

- 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**

Technical Sheet

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Angle bracket

Technical Data



Product Dimensions

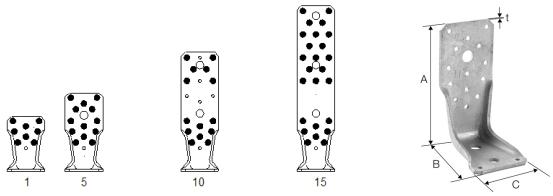
Reference	Connector Dimensions													
	Other				Product Dimensions[mm]				Joist		Flange B			
	Tun / DB nr.	NOB nr.	Qty per Box	Weight[kg]	A[mm]	B[mm]	C[mm]	t[mm]	Round		Round			Obround
									Ø5	Ø13.5[mm]	Ø5[mm]	Ø11[mm]	Ø13.5[mm]	Ø13.5x25[mm]
AKR95Z	2048459	55360544	25.0	0.24	95	85	65	3	9	-	2	1	1	-
AKR95LZ	2048462	55360563	25.0	0.24	95	85	65	3	9	-	2	1	-	1
AKR135Z	2048465	55360578	25.0	0.3	135	85	65	3	14	1	2	1	1	-
AKR135LZ	2048466	55360616	25.0	0.3	135	85	65	3	14	1	2	1	-	1
AKR285Z	2048467	55360620	25.0	0.56	285	85	65	3	26	3	2	1	1	-
AKR285LZ	2048468	55360635	25.0	0.5	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.

Technical Sheet

AKR-Z
Angle bracket

Characterisitic capacities - Full nailing



Reference	Holdowns capacity											
	Product characteristic capacities - Full nailing - 2 brackets per connection											
	Nail pattern	Number of Fasteners				Characteristic capacity - 2 angle brackets per connection - full nailing[kN]						
		Flange B		Joist		R4/5,k	$R_{1,k}$			$R_{2,k}=R_{3,k}$		
		Qty	Type	Qty	Type	CNA4.0x40/50/60	CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40	CNA4.0x50	CNA4.0x60
AKR95Z	1	1.0	M12**	8.0	CNA*	15.75 / kmod	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
AKR95LZ	1	1.0	M12**	8.0	CNA*	-	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	5	1.0	M12**	13.0	CNA*	15.75 / kmod	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
AKR135LZ	5	1.0	M12**	13.0	CNA*	-	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	15	1.0	M12**	25.0	CNA*	15.75 / kmod	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
AKR285LZ	15	1.0	M12**	25.0	CNA*	-	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.

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

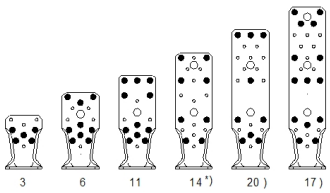
Combined load:

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

Technical Sheet

AKR-Z
Angle bracket

Characteristic capacities - Partial nailing



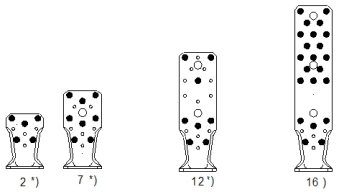
Reference	Holdowns capacity											
	Product characteristic capacities - Partial nailing - 2 brackets per connection											Product characteristic capacities - Full nailing - 2 brackets per connection
	nail pattern	Number of Fasteners				Characteristic capacity - 2 angle brackets per connection - full nailing[kN]						Characteristic capacity - 2 angle brackets per connection - full nailing[kN]
		Joist		Flange B		$R_{1,k}$			$R_{2,k}=R_{3,k}$			R4/5,k
		Qty	Type	Qty	Type	CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40/50/60
AKR95Z	3	5.0	CNA*	1.0	M12**	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	3	5.0	CNA*	1.0	M12**	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	6	9.0	CNA*	1.0	M12**	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	6	9.0	CNA*	1.0	M12**	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	17	14.0	CNA*	1.0	M12**	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	17	14.0	CNA*	1.0	M12**	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 Sheet

AKR-Z
Angle bracket

Characteristic capacities - Post connection



Reference	Holdowns capacity											
	Product characteristic capacities - Column nailing - 2 brackets per connection											
	nail pattern	Number of Fasteners				Characteristic Capacities[kN]						
		Joist		Flange B		R4/5,k	R1,k (2)			$R_{2,k}=R_{3,k}$		
		Qty	Type	Qty	Type	CNA4.0x40/50/60	CNA4.0x40	CNA4.0x50	CNA4.0x60	CNA4.0x40	CNA4.0x50	CNA4.0x60
AKR95Z	2	5	CNA*	1.0	M12**	15.75 / kmod	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
AKR95LZ	2	5	CNA*	1.0	M12**	-	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	7	8	CNA*	1.0	M12**	15.75 / kmod	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
AKR135LZ	7	8	CNA*	1.0	M12**	-	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	16	22	CNA*	1.0	M12**	15.75 / kmod	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
AKR285LZ	16	22	CNA*	1.0	M12**	-	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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