



LIEBIG HEAVY DUTY ANCHOR RANGE

ANCHORBOLT - SAFETYBOLT - SUPERPLUS

**Anchors for exceptionally high loads
in concrete and masonry**



European technical
approval option1

Exceptional loading. Exceptional performance.

When the EJOT fastener manufacturing Group acquired the LIEBIG brand, we made a promise to provide full accessibility to the LIEBIG product range and the technical data that supports it.

The unique modular design and absolute strength of LIEBIG anchoring products is well known and engineers around the world know the brand for its reputation to deliver outstanding performance.

Being less familiar with the EJOT brand is understandable, unless career paths have included sorties into the numerous sectors that comprise industrial roofing, cladding and insulation. Designing and manufacturing fastening solutions for this domain is EJOT's world.

This brochure brings together the power of LIEBIG's original anchoring technology with EJOT's manufacturing and technical excellence.

Together we are making LIEBIG products and the technical guidance to support them readily accessible; putting the world's finest anchoring technology back in your hands.



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A heavy duty Self-undercutting anchor for high performance applications
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Carbon steel zinc plated A4 stainless steel



European technical approval option1



LIEBIG®

The ORIGINAL Anchoring Technology

Heinrich Liebig was an inventor. Since 1946 the originality and innovation that the LIEBIG brand stands for, has gone largely unmatched and unrivalled.

In 1978 he designed and patented the expandable locking toggle.

In 1980 he patented the positive locking toggle bolt which activated expansion segments by way of an ingenious spring-loaded mechanism.

In 1981 he patented the tool he designed to create the perfect shape of undercut required to house the expansion shells of the positive locking toggle.

The LIEBIG ULTRAPLUS undercutting anchorage system was born and in turn, a further range of anchoring products all designed to deliver the same level of performance.



Structural engineers and construction professionals around the world have embraced the unique power and reliability of LIEBIG's original anchoring technology.



EJOT® **High performance** **fastening with** **unrivalled global** **support**

Worldwide, the EJOT name is synonymous with the excellence of its products and technical support. This approach has positioned EJOT as market leaders in so many diverse and international sectors, predominantly automotive engineering and industrial roofing / cladding construction.

Our design and testing wing, EJOT Applitec is at the hub of everything we do worldwide, often in partnership with many leading OEM's.

When customers need support with technical issues on-site, particularly where there are structural implications, our teams of Applitec technicians are able to replicate conditions off-site – providing a resource of immeasurable value. Testing data can often enable structural engineers to determine if an incorrect installation is still fit for purpose.



ANCHOR BOLT M6-M16

General purpose heavy duty anchor.

FUNCTION

Application of the installation torque draws the anchor's cone into the thick-walled expansion sleeve. This causes the sleeve to be pressed against the sidewalls of the hole and develops tension resistance through friction.



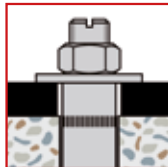
Type AB

Type AS

Unique correct-set indicator washers



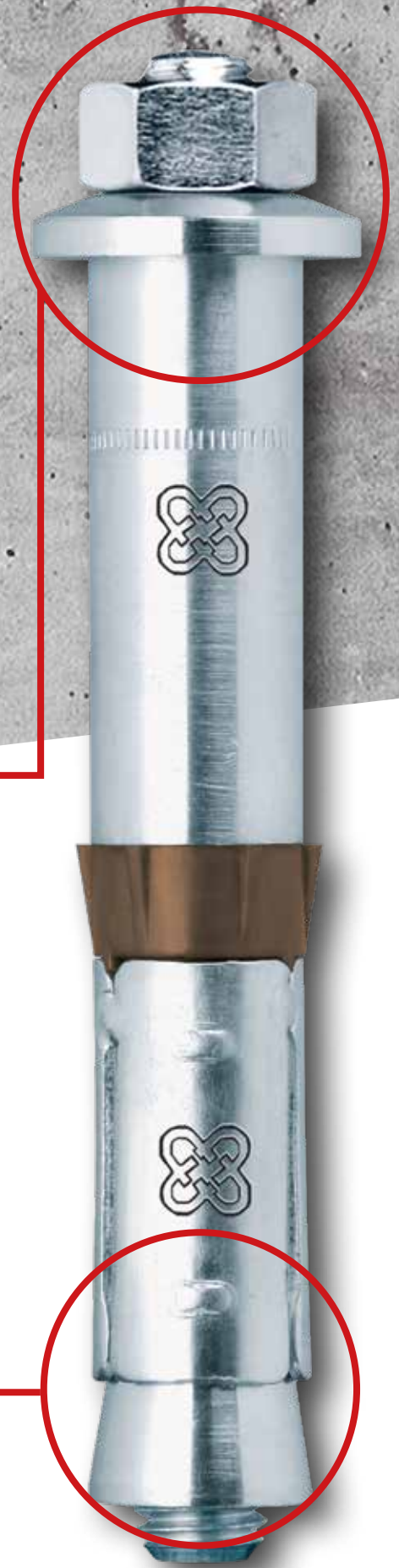
Uninstalled



Installed

BENEFITS

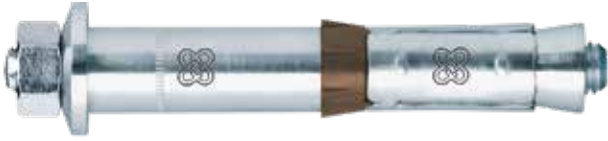
- Economical high capacity anchor
- Approved for use in cracked and non-cracked concrete.
- Torque indication from domed washer
- Custom lengths available on request
- Tested in accordance with ETA Option 1



EJOT® High performance fastening with unrivalled global support

CONSTRUCTION

AB With hex nut, domed washer and threaded stud



AS With hex head screw and domed washer



MATERIAL

Grade 8.8 carbon steel, zinc plated

A4 stainless steel

BASE MATERIAL

Cracked and non-cracked concrete: C20/25 to C50/60

APPROVAL

ETA Option 1 – Carbon steel, zinc plated

LOAD RANGE

Tension: $N_{perm} = 2.4 - 37.2$ [kN]

Shear: $V_{perm} = 5.2 - 54.9$ [kN]

PRODUCT RANGE

AB: M6 - M16, carbon steel, zinc plated / A4 stainless steel

AS: M6 - M16, carbon steel, zinc plated / M6 - M12, A4 stainless steel

APPLICATIONS

- Steel construction
- Cable trays
- Railing
- Machines
- Gates
- Façades
- Lifting systems
- Base plates

BENEFITS

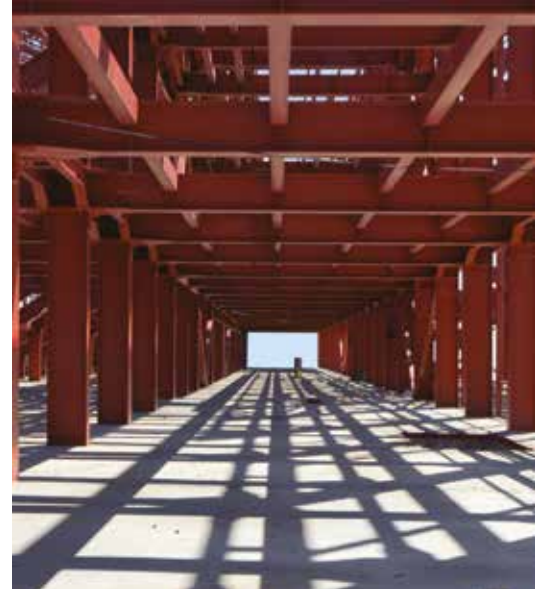
- Economical anchor for wide range of uses
- Torque indication from domed washer

PRODUCT DESCRIPTION

- Heavy duty anchor for high loads
- Torque-controlled mechanical anchor



European technical approval option1



ANCHOR BOLT M6-M16

Custom lengths available on request.

ANCHOR AB, LAB Carbon Steel Zinc Plated

Threaded stud with hex nut and domed washer

Material: Grade 8.8 carbon steel, zinc plated

Approvals: ETA Option 1



New Type	Old Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
AB M6-10/45/5	AB 10/0	LAB0610045005	M6	10 x 60	5	12	45	70	2.7	50
AB M6-10/45/15	AB 10/15	LAB0610045015	M6	10 x 60	15	12	45	80	3.4	50
AB M6-10/45/40	AB 10/40	LAB0610045040	M6	10 x 60	40	12	45	105	4.6	50
AB M8-12/55/5	AB12/0	LAB0812055005	M8	12 x 70	5	14	55	85	5.8	25
AB M8-12/55/15	AB 12/15	LAB0812055015	M8	12 x 70	15	14	55	95	7.0	25
AB M8-12/55/40	AB 12/40	LAB0812055040	M8	12 x 70	40	14	55	120	9.0	25
AB M8-12/55/65	AB 12/65	LAB0812055065	M8	12 x 70	65	14	55	145	10.6	25
AB M8-12/55/100	-	LAB0812055100	M8	12 x 70	100	14	55	180	12.8	25
AB M10-15/65/5 AB	15/0	LAB1015065005	M10	15 x 85	5	17	65	100	11.0	25
AB M10-15/65/15	AB 15/15	LAB1015065015	M10	15 x 85	15	17	65	110	12.8	25
AB M10-15/65/40	AB 15/40	LAB1015065040	M10	15 x 85	40	17	65	135	16.0	10
AB M10-15/65/65	AB 15/65	LAB1015065065	M10	15 x 85	65	17	65	160	18.5	10
AB M10-15/65/100	-	LAB1015065100	M10	15 x 85	100	17	65	195	22.0	10
AB M12-20/80/5	AB 20/0	LAB1220080005	M12	20 x 100	5	21	80	120	20.8	10
AB M12-20/80/15	AB 20/15	LAB1220080015	M12	20 x 100	15	21	80	130	24.8	10
AB M12-20/80/40	AB 20/40	LAB1220080040	M12	20 x 100	40	21	80	155	29.0	10
AB M12-20/80/65	AB 20/65	LAB1220080065	M12	20 x 100	65	21	80	180	33.5	10
AB M12-20/80/100	-	LAB1220080100	M12	20 x 100	100	21	80	215	39.8	20
AB M16-25/100/5	AB 25/0	LAB1625100005	M16	25 x 125	5	26	100	150	43.4	5
AB M16-25/100/15	AB 25/15	LAB1625100015	M16	25 x 125	15	26	100	160	48.4	5
AB M16-25/100/40	AB 25/40	LAB1625100040	M16	25 x 125	40	26	100	185	56.7	5
AB M16-25/100/65	AB 25/65	LAB1625100065	M16	25 x 125	65	26	100	210	63.6	10
AB M16-25/100/100	-	LAB1625100100	M16	25 x 125	100	26	100	245	73.3	10

ANCHOR AS Carbon Steel Zinc Plated

Hex head screw and domed washer

Material: Grade 8.8 carbon steel, zinc plated

Approval: ETA Option 1



New Type	Old Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
AS M6-10/45/5	AS 10/0	LAS0610045005	M6	10 x 60	5	12	45	70	2.7	50
AS M6-10/45/15	AS 10/15	LAS0610045015	M6	10 x 60	15	12	45	80	3.4	50
AS M6-10/45/40	AS 10/40	LAS0610045040	M6	10 x 60	40	12	45	105	4.6	50
AS M8-12/55/5	AS 12/0	LAS0812055005	M8	12 x 70	5	14	55	80	5.8	25
AS M8-12/55/15	AS 12/15	LAS0812055015	M8	12 x 70	15	14	55	90	7.0	25
AS M8-12/55/40	AS 12/40	LAS0812055040	M8	12 x 70	40	14	55	115	9.0	25
AS M10-15/65/5	AS 15/0	LAS1015065005	M10	15 x 85	5	17	65	95	11.0	25
AS M10-15/65/15	AS 15/15	LAS1015065015	M10	15 x 85	15	17	65	105	12.8	25
AS M10-15/65/40	AS 15/40	LAS1015065040	M10	15 x 85	40	17	65	130	16.0	10
AS M12-20/80/5	AS 20/0	LAS1220080005	M12	20 x 100	5	21	80	113	20.8	10
AS M12-20/80/15	AS 20/15	LAS1220080015	M12	20 x 100	15	21	80	123	24.8	10
AS M12-20/80/40	AS 20/40	LAS1220080040	M12	20 x 100	40	21	80	148	29.0	10
AS M16-25/100/15	AS 25/15	LAS1625100015	M16	25 x 125	15	26	100	155	48.4	5
AS M16-25/100/40	AS 25/40	LAS1625100040	M16	25 x 125	40	26	100	180	56.7	5

TECHNICAL DATA Carbon Steel Zinc Plated

Permissible loads for single anchors with no influencing edge distances or spacings. Loads are calculated using partial safety factors from ETAG 001 and the characteristic anchor and installation data from this catalogue. Design calculations shall follow the requirements of ETA-06/0123.

Material: Carbon steel, Grade 8.8, zinc plated

Thread Size	M6	M8	M10	M12	M16
Effective embedment depth (h_{ef}) (mm)	45	55	65	80	100
Type AB..., AS...	M6-10/45/...	M8-12/55/...	M10-15/65/...	M12-20/80/...	M16-25/100/...

Permissible tension loads¹⁾

N_{perm}	Concrete	Rebar	[kN]	Thread Size				
				M6	M8	M10	M12	M16
	Cracked	C20/25	[kN]	2.4	3.6	7.6	12.3	17.1
		C30/37	[kN]	2.9	4.4	9.3	15.0	20.9
		C40/50	[kN]	3.4	5.0	10.7	17.3	24.2
		C50/60	[kN]	3.7	5.5	11.8	19.0	26.6
	Non-Cracked Concrete ³⁾	C20/25	[kN]	3.0	4.8	9.5	17.1	24.0
		C30/37	[kN]	3.6	5.8	11.6	20.9	29.3
		C40/50	[kN]	4.2	6.7	13.4	24.2	33.8
		C50/60	[kN]	4.6	7.4	14.8	26.6	37.2

Permissible shear loads^{1) 2)}

V_{perm}	Concrete	Rebar	[kN]	Thread Size				
				M6	M8	M10	M12	M16
	Cracked	C20/25	[kN]	5.2	7.0	18.0	24.5	34.3
		C30/37	[kN]	6.3	8.5	21.9	29.8	41.7
		C40/50	[kN]	7.3	9.9	22.3	34.3	48.5
		C50/60	[kN]	8.0	10.8	22.3	34.3	53.1
	Non-Cracked Concrete ³⁾	C20/25	[kN]	7.2	9.8	22.3	34.3	48.0
		C30/37	[kN]	8.6	11.9	22.3	34.3	54.9
		C40/50	[kN]	8.6	13.8	22.3	34.3	54.9
		C50/60	[kN]	8.6	14.3	22.3	34.3	54.9

Permissible bending moments^{1) 5)}

M_{perm} ⁴⁾	[Nm]	M6	M8	M10	M12	M16
		6.9	17.1	34.3	60	152

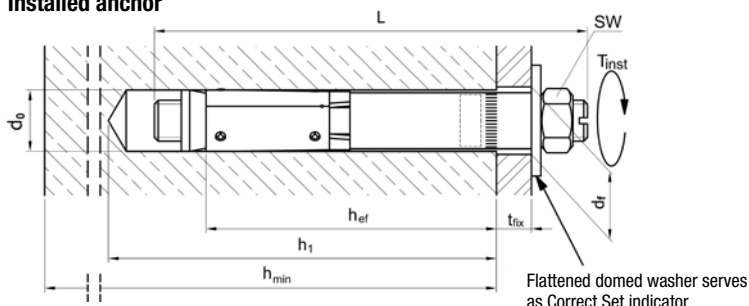
Spacings, edge distances and member thicknesses

Parameter	Symbol	Unit	M6	M8	M10	M12	M16
Effective embedment depth	h_{ef}	[mm]	45	55	65	80	100
Characteristic spacing ⁵⁾	$s_{cr,N}$	[mm]	135	165	195	240	300
Minimum spacing	s_{min}	[mm]	60	80	130	200	300
Characteristic edge distance ⁶⁾	$c_{cr,N}$	[mm]	67.5	82.5	97.5	120	150
Minimum edge distance	c_{min}	[mm]	80	100	130	200	300
Minimum member thickness	h_{min}	[mm]	100	110	130	160	200

Installation data

Parameter	Symbol	Unit	M6	M8	M10	M12	M16	
Drill hole diameter	d_0	[mm]	10	12	15	20	25	
Drill hole depth	h_1	[mm]	60	70	85	100	125	
Clearance hole in the fixture	Through-fix anchorage	d_f	[mm]	12	14	17	21	26
	Installation on threaded stud	d_f	[mm]	7	9	12	14	18
Width across flat	AB	sw	[mm]	10	13	17	19	24
	AS	sw	[mm]	10	13	17	19	24
Installation torque	AB	T_{inst}	[Nm]	7	15	30	50	115
	AS	T_{inst}	[Nm]	8	20	50	75	170

Installed anchor



- 1) The permissible loads have been calculated using the partial safety factors for resistances stated in the ETA-approval and a partial safety factor for actions of $\gamma_F = 1.4$. The permissible loads are valid for unreinforced concrete and reinforced concrete with a rebar spacing $s \geq 15$ cm and reinforced concrete with a rebar spacing $s \geq 10$ cm if the rebar is 10 mm or smaller.
- 2) The permissible shear loads are based on a single anchor without influencing concrete edges. For shear loads applied close to an edge ($c \leq 10 h_{ef}$ or $60d$) concrete edge failure must be checked per ETAG 001, Annex C, design method A.
- 3) Concrete is considered non-cracked when the tensile stress within the concrete is $\sigma_t + \sigma_a \leq 0$. In the absence of detailed verification $\sigma_a = 3$ N/mm² can be assumed (σ_t equals the tensile stress within the concrete as a result of external loads, forces on anchors included).
- 4) The permissible bending moments are only valid for the threaded stud type AB (e.g. in case of a distance mounting).
- 5) For spacings smaller than the characteristic values (i.e. $s \leq s_{cr,N}$) a calculation per ETAG 001, Annex C, design method A shall be performed.
- 6) The actual edge distance shall not be less than the value of c_{min} shown in the table.

Custom lengths available on request.

ANCHOR AB A4 stainless steel

Threaded stud with hex nut and domed washer
Material: A4 stainless steel



New Type	Old Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
AB M6-10/45/5 A4	AB 10/0 A4	AB0610045005A4	M6	10 x 60	5	12	45	70	2.9	50
AB M6-10/45/15 A4	AB 10/15 A4	AB0610045015A4	M6	10 x 60	15	12	45	80	3.4	50
AB M6-10/45/40 A4	AB 10/40 A4	AB0610045040A4	M6	10 x 60	40	12	45	105	4.6	50
AB M8-12/55/5 A4	AB 12/0 A4	AB0812055005A4	M8	12 x 70	5	14	55	85	6.2	25
AB M8-12/55/15 A4	AB 12/15 A4	AB0812055015A4	M8	12 x 70	15	14	55	95	7.0	25
AB M8-12/55/40 A4	AB 12/40 A4	AB0812055040A4	M8	12 x 70	40	14	55	120	9.0	25
AB M10-15/65/5 A4	AB 15/0 A4	AB1015070005A4	M10	15 x 85	5	17	65	100	11.5	25
AB M10-15/65/15 A4	AB 15/15 A4	AB1015070015A4	M10	15 x 85	15	17	65	110	12.8	25
AB M10-15/65/40 A4	AB 15/40 A4	AB1015070040A4	M10	15 x 85	40	17	65	135	16.0	10
AB M12-20/80/5 A4	AB 20/0 A4	AB1220080005A4	M12	20 x 95	5	21	80	120	25.1	10
AB M12-20/80/15 A4	AB 20/15 A4	AB1220080015A4	M12	20 x 95	15	21	80	130	24.8	10
AB M12-20/80/40 A4	AB 20/40 A4	AB1220080040A4	M12	20 x 95	40	21	80	155	29.0	10
AB M16-25/100/15 A4	AB 25/15 A4	AB1625100015A4	M16	25 x 125	15	26	100	160	48.4	5
AB M16-25/100/40 A4	AB 25/40 A4	AB1625100040A4	M16	25 x 125	40	26	100	185	56.7	5

ANCHOR AS A4 stainless steel

Hex head screw and domed washer
Material: A4 stainless steel



New Type	Old Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
AS M6-10/45/5 A4	AS 10/0 A4	AS0610045005A4	M6	10 x 60	5	12	45	70	2.9	50
AS M6-10/45/15 A4	AS 10/15 A4	AS0610045015A4	M6	10 x 60	15	12	45	80	3.4	50
AS M8-12/55/15 A4	AS 12/15 A4	AS0812055015A4	M8	12 x 70	15	14	55	90	7.0	25
AS M8-12/55/40 A4	AS 12/40 A4	AS0812055040A4	M8	12 x 70	40	14	55	115	9.0	25
AS M10-15/65/15 A4	AS 15/15 A4	AS1015065015A4	M10	15 x 85	15	17	65	105	12.8	25
AS M10-15/65/40 A4	AS 15/40 A4	AS1015065040A4	M10	15 x 85	40	17	65	130	16.0	10
AS M12-20/80/15 A4	AS 20/15 A4	AS1220080015A4	M12	20 x 95	15	21	80	123	24.8	10
AS M12-20/80/40 A4	AS 20/40 A4	AS1220080040A4	M12	20 x 95	40	21	80	148	29.0	10

TECHNICAL DATA A4 stainless steel

Permissible loads for single anchors with no influencing edge distances or spacings. Loads are calculated using partial safety factors from ETAG 001 and the characteristic anchor and installation data from this catalogue.

Material: A4 Stainless steel

Thread Size	M6	M8	M10	M12	M16
Effective embedment depth (h_{ef}) (mm)	45	55	65	80	100
Type AB..., AS...	M6-10/45/...	M8-12/55/...	M10-15/65/...	M12-20/80/...	M16-25/100/...

Permissible tension loads¹⁾

N_{perm}		Concrete	[kN]	M6		M8		M10		M12		M16	
				Cracked	Non-Cracked Concrete ³⁾	Cracked	Non-Cracked Concrete ³⁾	Cracked	Non-Cracked Concrete ³⁾	Cracked	Non-Cracked Concrete ³⁾	Cracked	Non-Cracked Concrete ³⁾
	Cracked Concrete	C20/25	[kN]	-	-	-	-	-	-	7.1	-	10.7	-
		C30/37	[kN]	-	-	-	-	-	-	8.4	-	12.6	-
		C40/50	[kN]	-	-	-	-	-	-	9.5	-	14.3	-
		C50/60	[kN]	-	-	-	-	-	-	10.5	-	15.8	-
	Non-Cracked Concrete ³⁾	C20/25	[kN]	3.2	4.3	7.1	10.7	16.0					
		C30/37	[kN]	3.9	5.2	8.6	12.6	18.8					
		C40/50	[kN]	4.5	6.1	10.0	14.3	21.4					
		C50/60	[kN]	5.0	6.7	11.0	15.8	23.7					

Permissible shear loads^{1) 2)}

V_{perm}		Concrete	[kN]	M6		M8		M10		M12		M16	
				Cracked	Non-Cracked Concrete ³⁾	Cracked	Non-Cracked Concrete ³⁾	Cracked	Non-Cracked Concrete ³⁾	Cracked	Non-Cracked Concrete ³⁾	Cracked	Non-Cracked Concrete ³⁾
	Cracked Concrete	C20/25	[kN]	-	-	-	-	-	-	20.5	20.5	28.6	28.6
		C30/37	[kN]	-	-	-	-	-	-	24.2	24.2	33.7	33.7
		C40/50	[kN]	-	-	-	-	-	-	27.5	24.6	38.3	38.3
		C50/60	[kN]	-	-	-	-	-	-	28.9	24.6	42.3	41.5
	Non-Cracked Concrete ³⁾	C20/25	[kN]	3.2	4.3	7.1	10.7	16.0					
		C30/37	[kN]	3.9	5.2	8.6	12.6	18.8					
		C40/50	[kN]	4.5	6.1	10.0	14.3	21.4					
		C50/60	[kN]	5.0	6.7	11.0	15.8	23.7					

Permissible bending moments^{1) 4)}

M_{perm} ⁴⁾	[Nm]	M6	M8	M10	M12	M16
		6.5	16.1	32.1	56.1	142.7

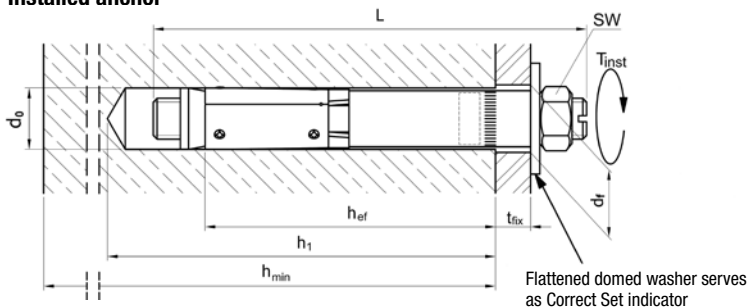
Spacings, edge distances and member thicknesses

Parameter	Symbol	Unit	M6	M8	M10	M12	M16
Effective embedment depth	h_{ef}	[mm]	45	55	70	80	100
Characteristic spacing ⁵⁾	$s_{cr,N}$	[mm]	140	165	235	240	300
Minimum spacing	s_{min}	[mm]	140	165	235	80	100
Characteristic edge distance	$c_{cr,N}$	[mm]	80	120	165	120	150
Minimum edge distance ⁶⁾	c_{min}	[mm]	80	120	165	160	200
Minimum member thickness	h_{min}	[mm]	100	110	130	150	200

Installation data

Parameter	Symbol	Unit	M6	M8	M10	M12	M16	
Drill hole diameter	d_0	[mm]	10	12	15	20	25	
Drill hole depth	h_1	[mm]	60	70	85	95	125	
Clearance hole in the fixture	Through-fix anchorage	d_f	[mm]	12	14	17	21	26
	Installation on threaded stud	d_f	[mm]	7	9	12	14	18
Width across flats	AB, AS	sw	[mm]	10	13	17	19	24
Installation torque	AB, AS	T_{inst}	[Nm]	10	25	50	80	180

Installed anchor



- 1) The permissible loads have been calculated using the partial safety factors for resistances stated in the ETA-approval and a partial safety factor for actions of $\gamma_c = 1.4$. The permissible loads are valid for unreinforced concrete and reinforced concrete with a rebar spacing $s \geq 15$ cm and reinforced concrete with a rebar spacing $s \geq 10$ cm if the rebar is 10 mm or smaller.
- 2) The permissible shear loads are based on a single anchor without influencing concrete edges. For shear loads applied close to an edge ($c \leq 10 h_{ef}$ or $60d$) concrete edge failure must be checked per ETAG 001, Annex C, design method A.
- 3) Concrete is considered non-cracked when the tensile stress within the concrete is $\sigma_L + \sigma_R \leq 0$. In the absence of detailed verification $\sigma_R = 3$ N/mm² can be assumed (σ_L equals the tensile stress within the concrete as a result of external loads, forces on anchors included).
- 4) The permissible bending moments are only valid for the threaded stud type AB (e.g. in case of a distance mounting).
- 5) For spacings smaller than the characteristic values (i.e. $s \leq s_{cr,N}$) a calculation per ETAG 001, Annex C, design method A shall be performed.
- 6) The actual edge distance shall not be less than the value of c_{min} shown in the table.

SAFETY BOLT M6-M20

Double expansion, heavy duty anchor for increased security.

FUNCTION

Application of the installation torque causes the anchor's two opposing cones to be drawn into the expansion sleeve. This causes the sleeve to be pressed against the sidewalls of the hole over its entire length and results in optimum frictional resistance and high load capacity in cracked and non-cracked concrete.



Type B



Type S

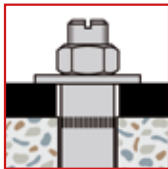


Type SK

Unique correct-set indicator washers



Uninstalled



Installed



European technical approval option 1

BENEFITS

- High capacity anchor for use in cracked and non-cracked concrete
- Uniformed expansion of sleeve over entire length
- Solid all-steel construction
- Torque indication from domed washer
- Custom lengths available on request



CONSTRUCTION

B With hex nut, domed washer and threaded stud



S With hex head screw and domed washer



SK With countersunk headed screw



MATERIAL

Grade 8.8 carbon steel, zinc plated
A4 stainless steel

BASE MATERIAL

Cracked and non-cracked concrete: C20/25 to C50/60

APPROVAL

ETA-06/0108 – Option 1 – Carbon steel, zinc plated

LOAD RANGE

Tension: $N_{perm} = 2.4 - 48.9$ [kN]
Shear: $V_{perm} = 5.2 - 80.6$ [kN]

PRODUCT RANGE

B: M6 – M20, carbon steel, zinc plated / A4 stainless steel
S: M6 – M20, carbon steel, zinc plated / M6 – M12, A4 stainless steel
SK: M6 – M16, carbon steel, zinc plated / M6 – M12, A4 stainless steel

APPLICATIONS

- Steel construction
- Cable trays
- Railing
- Machines
- Gates
- Façades
- Lifting systems
- Base plates

BENEFITS

- Cylindrical expansion with optimal friction resistance
- Higher anchoring intensity from twin-cone design
- Torque indication from domed washer

PRODUCT DESCRIPTION

- Twin-coned heavy duty sleeve anchor for high loads
- Torque-controlled mechanical anchor
- Solid, all-steel construction



European technical approval option1

SAFETY BOLT M6-M20

Custom lengths available on request.

SAFETY BOLT B Carbon Steel Zinc Plated

Threaded stud with hex nut and domed washer

Material: Grade 8.8 carbon steel, zinc plated

Approvals: ETA-06/0108 – Option 1



New Type	Old Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
B M6-10/45/5	B 10/20	LB0610045005	M6	10 x 60	5	12	45	70	2.7	50
B M6-10/45/15	B 10/35	LB0610045015	M6	10 x 60	15	12	45	80	3.4	50
B M6-10/45/40	B 10/60	LB0610045040	M6	10 x 60	40	12	45	105	4.6	50
B M8-12/55/5	B 12/25	LB0812055005	M8	12 x 70	5	14	55	85	5.8	25
B M8-12/55/15	B 12/40	LB0812055015	M8	12 x 70	15	14	55	95	7.0	25
B M8-12/55/40	B 12/65	LB0812055040	M8	12 x 70	40	14	55	120	9.0	25
B M8-12/55/65	B 12/90	LB0812055065	M8	12 x 70	65	14	55	145	10.6	25
B M8-12/55/100	B 12/125	LB0812055100	M8	12 x 70	100	14	55	180	12.7	25
B M10-15/70/5	B 15/30	LB1015070005	M10	15 x 85	5	17	70	100	11.0	25
B M10-15/70/15	B 15/45	LB1015070015	M10	15 x 85	15	17	70	110	12.8	25
B M10-15/70/40	B 15/70	LB1015070040	M10	15 x 85	40	17	70	135	16.0	10
B M10-15/70/65	B 15/95	LB1015070065	M10	15 x 85	65	17	70	160	18.5	10
B M10-15/70/100	B 15/120	LB1015070100	M10	15 x 85	100	17	70	195	22.0	10
B M12-20/80/5	B 20/35	LB1220080005	M12	20 x 100	5	21	80	120	20.8	10
B M12-20/80/15	B 20/50	LB1220080015	M12	20 x 100	15	21	80	130	24.8	10
B M12-20/80/40	B 20/75	LB1220080040	M12	20 x 100	40	21	80	155	29.0	10
B M12-20/80/65	B 20/100	LB1220080065	M12	20 x 100	65	21	80	180	33.5	10
B M12-20/80/100	B 20/135	LB1220080100	M12	20 x 100	100	21	80	215	39.8	10
B M16-25/100/5	B 25/40	LB1625100005	M16	25 x 125	5	26	100	150	43.4	5
B M16-25/100/15	B 25/55	LB1625100015	M16	25 x 125	15	26	100	160	48.4	5
B M16-25/100/40	B 25/80	LB1625100040	M16	25 x 125	40	26	100	185	56.7	5
B M16-25/100/65	B 25/105	LB1625100065	M16	25 x 125	65	26	100	210	63.6	5
B M16-25/100/100	B 25/130	LB1625100100	M16	25 x 125	100	26	100	245	75.0	5
B M20-30/125/15*	B 30/65	B2030125015	M20	30 x 150	15	32	125	180	85.9	5
B M20-30/125/40*	B 30/90	B2030125040	M20	30 x 150	40	32	125	205	96.7	5
B M20-30/125/65*	B 30/115	B2030125065	M20	30 x 150	65	32	125	230	107.6	5
B M20-30/125/100*	B 30/150	B2030125100	M20	30 x 150	100	32	125	265	122.0	5

*Not included in approval.

TECHNICAL DATA Carbon Steel Zinc Plated

Permissible loads for single anchors with no influencing edge distances or spacings. Loads are calculated using partial safety factors from ETAG 001 and the characteristic anchor and installation data from this catalogue. Design calculations shall follow the requirements of ETA-06/0108.

Material: Carbon steel, Grade 8.8, zinc plated

Thread Size	M6	M8	M10	M12	M16	M20 ⁷⁾
Effective embedment depth (h_{ef}) (mm)	45	55	70	80	100	125
Type B...	M6-10/45/...	M8-12/55/...	M10-15/70/...	M12-20/80/...	M16-25/100/...	M20-30/125/...

Permissible tension loads¹⁾

N_{perm}		Concrete	[kN]	Thread Size					
				M6	M8	M10	M12	M16	M20 ⁷⁾
	Cracked Concrete	C20/25	[kN]	2.4	3.6	7.6	12.3	17.1	18.6
		C30/37	[kN]	2.9	4.4	9.3	15.0	20.9	22.7
		C40/50	[kN]	3.4	5.0	10.7	17.3	24.2	26.2
		C50/60	[kN]	3.7	5.5	11.8	19.0	26.2	28.8
	Non-Cracked Concrete ³⁾	C20/25	[kN]	3.0	4.8	9.5	17.2	24.0	31.6
		C30/37	[kN]	3.6	5.8	11.6	21.0	29.3	38.5
		C40/50	[kN]	4.2	6.7	13.4	24.2	33.8	44.5
		C50/60	[kN]	4.6	7.4	14.8	26.2	37.2	48.9

Permissible shear loads^{1) 2)}

V_{perm}		Concrete	[kN]	Thread Size					
				M6	M8	M10	M12	M16	M20 ⁷⁾
	Cracked Concrete	C20/25	[kN]	5.2	7.0	20.1	24.5	34.3	49.2
		C30/37	[kN]	6.3	8.5	22.3	29.8	41.7	59.8
		C40/50	[kN]	7.3	9.9	22.3	34.3	48.5	61.6
		C50/60	[kN]	8.0	10.8	22.3	34.3	53.1	76.3
	Non-Cracked Concrete ³⁾	C20/25	[kN]	7.2	9.8	22.3	34.3	48.0	68.9
		C30/37	[kN]	8.6	11.9	22.3	34.3	54.9	80.6
		C40/50	[kN]	8.6	13.8	22.3	34.3	54.9	80.6
		C50/60	[kN]	8.6	14.3	22.3	34.3	54.9	80.6

Permissible bending moments^{1) 4)}

M_{perm}	[Nm]	M6	M8	M10	M12	M16	M20 ⁷⁾
		6.9	17.1	34.3	60.0	152.0	296.6

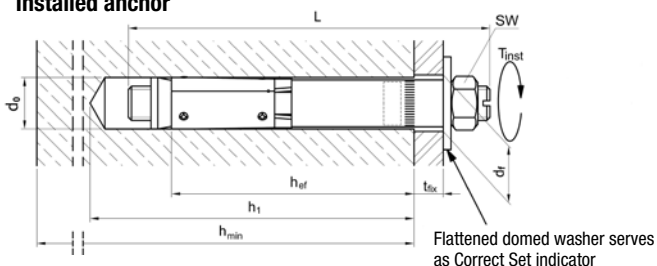
Spacings, edge distances and member thicknesses

Parameter	Symbol	[mm]	M6	M8	M10	M12	M16	M20 ⁷⁾
Effective embedment depth	h_{ef}	[mm]	45	55	70	80	100	125
Characteristic spacing ⁵⁾	$s_{cr, N}$	[mm]	135	165	210	240	300	375
Minimum spacing	s_{min}	[mm]	60	100	150	200	250	195
Characteristic edge distance	$c_{cr, N}$	[mm]	67.5	82.5	105	120	150	185
Minimum edge distance ⁶⁾	c_{min}	[mm]	80	100	150	200	250	350
Minimum member thickness	h_{min}	[mm]	100	110	140	160	200	250

Installation data

Parameter	Symbol	[mm]	M6	M8	M10	M12	M16	M20 ⁷⁾	
Drill hole diameter	d_0	[mm]	10	12	15	20	25	30	
Drill hole depth	h_1	[mm]	60	70	85	100	125	150	
Clearance hole in the fixture	Through-fix anchorage	d_f	[mm]	12	14	17	21	26	32
	Installation on threaded stud	d_f	[mm]	7	9	12	14	18	22
Width across flats	sw	[mm]	10	13	17	19	24	32	
Installation torque	T_{inst}	[Nm]	8	15	40	70	115	300	

Installed anchor



- 1) The permissible loads have been calculated using the partial safety factors for resistances stated in the ETA-approval and a partial safety factor for actions of $\gamma_c = 1.4$. The permissible loads are valid for unreinforced concrete and reinforced concrete with a rebar spacing $s \geq 15$ cm and reinforced concrete with a rebar spacing $s \geq 10$ cm if the rebar is 10 mm or smaller.
- 2) The permissible shear loads are based on a single anchor without influencing concrete edges. For shear loads applied close to an edge ($c \leq 10 h_{ef}$ or $60 d$) concrete edge failure must be checked per ETAG 001, Annex C, design method A.
- 3) Concrete is considered non-cracked when the tensile stress within the concrete is $\sigma_t + \sigma_r \leq 0$. In the absence of detailed verification $\sigma_r = 3$ N/mm² can be assumed (σ_t equals the tensile stress within the concrete as a result of external loads, forces on anchors included).
- 4) The permissible bending moments are only valid for the threaded stud (e.g. in case of a distance mounting).
- 5) For spacings smaller than the characteristic values (i.e. $s \leq s_{cr, N}$) a calculation per ETAG 001, Annex C, design method A shall be performed. For details, see ETA-06/0108.
- 6) The actual edge distance shall not be less than the value of c_{min} shown in the table.
- 7) Size M20 is not included in the approval.

Custom lengths available on request.

SAFETY BOLT S Carbon Steel Zinc Plated

Hex head screw and domed washer

Material: Grade 8.8 carbon steel, zinc plated

Approvals: ETA-06/0108 – Option 1



New Type	Old Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
S M6-10/45/5	S 10/20	LS0610045005	M6	10 x 60	5	12	45	70	2.7	50
S M6-10/45/15	S 10/35	LS0610045015	M6	10 x 60	15	12	45	80	3.4	50
S M6-10/45/40	S 10/60	LS0610045040	M6	10 x 60	40	12	45	105	4.6	50
S M8-12/55/5	S 12/25	LS0812055005	M8	12 x 70	5	14	55	80	5.8	25
S M8-12/55/15	S 12/40	LS0812055015	M8	12 x 70	15	14	55	90	7.0	25
S M8-12/55/40	S 12/65	LS0812055040	M8	12 x 70	40	14	55	115	9.0	25
S M10-15/70/5	S 15/30	LS1015070005	M8	12 x 70	5	17	70	95	11.0	25
S M10-15/70/15	S 15/45	LS1015070015	M10	15 x 85	15	17	70	105	12.8	25
S M10-15/70/40	S 15/70	LS1015070040	M12	20 x 100	40	17	70	130	16.0	10
S M12-20/80/5	S 20/35	LS1220080005	M16	25 x 125	5	21	80	113	20.8	10
S M12-20/80/15	S 20/50	LS1220080015	M16	25 x 125	15	21	80	123	24.8	10
S M12-20/80/40	S 20/75	LS1220080040	M16	25 x 125	40	21	80	148	29.0	10
S M16-25/100/5	B 25/40	LS1625100005	M16	25 x 125	5	26	100	145	43.4	5
S M16-25/100/15	S 25/55	LS1625100015	M16	25 x 125	15	26	100	155	48.4	5
S M16-25/100/40	S 25/80	LS1625100040	M20	30 x 150	40	26	105	180	56.7	5
S M20-30/125/15*	S 30/65	S2030125015	M20	30 x 150	15	32	125	180	85.9	5
S M20-30/125/40*	S 30/90	S2030125040	M20	30 x 150	40	32	125	205	96.7	5

*Not included in approval.

SAFETY BOLT SK Carbon Steel Zinc Plated

Countersunk head screw

Grade 8.8 carbon steel, zinc plated

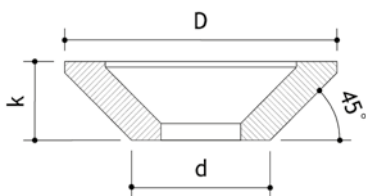
Approvals: ETA-06/0108 – Option 1



New Type	Old Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
SK M6-10/45/6**	SK 10/20	LSK0610045006	M6	10 x 60	6	12	45	70	2.7	50
SK M6-10/45/15	SK 10/35	LSK0610045015	M6	10 x 60	15	12	45	70	3.4	50
SK M6-10/45/40	SK 10/60	LSK0610045040	M6	10 x 60	40	12	45	95	4.6	50
SK M8-12/55/10**	SK 12/25	LSK0812055010	M8	12 x 70	10	14	55	75	5.8	25
SK M8-12/55/15	SK 12/40	LSK0812055015	M8	12 x 70	15	14	55	85	7.0	25
SK M8-12/55/40	SK 12/65	LSK0812055040	M8	12 x 70	40	14	55	110	9.0	25
SK M10-15/70/10**	SK 15/30	LSK1015070010	M10	15 x 85	10	17	70	90	11.0	25
SK M10-15/70/15	SK 15/45	LSK1015070015	M10	15 x 85	15	17	70	100	12.8	25
SK M10-15/70/40	SK 15/70	LSK1015070040	M10	15 x 85	40	17	70	120	26.0	25
SK M12-20/80/15	SK 20/50	LSK1220080015	M12	20 x 100	15	21	80	110	24.8	10
SK M12-20/80/40	SK 20/75	LSK1220080040	M10	20 x 100	40	21	80	135	29.0	10
SK M16-25/100/15	SK 25/55	LSK1625100015	M16	25 x 125	15	26	100	135	48.4	5
SK M16-25/100/40	SK 25/80	LSK1625100040	M16	25 x 125	40	26	100	160	56.7	5

**MT0.

Countersunk washer



Size	D (mm)	d (mm)	k (mm)
M6	20	10	5,5
M8	24	12	6,5
M10	27	15	7
M12	33	19	8
M16	50	24	14

TECHNICAL DATA Carbon Steel Zinc Plated

Permissible loads for single anchors with no influencing edge distances or spacings. Loads are calculated using partial safety factors from ETAG 001 and the characteristic anchor and installation data from this catalogue. Design calculations shall follow the requirements of ETA-06/0108.

Material: Carbon steel, Grade 8.8, zinc plated

Thread Size	M6	M8	M10	M12	M16	M20 ⁶⁾
Effective embedment depth (h_{ef}) (mm)	45	55	70	80	100	125
Type S..., SK...	M6-10/45/...	M8-12/55/...	M10-15/70/...	M12-20/80/...	M16-25/100/...	M20-30/125/...

Permissible tension loads¹⁾

N_{perm}								
			M6	M8	M10	M12	M16	M20 ⁶⁾
	Cracked Concrete	C20/25 [kN]	2.4	3.6	7.6	12.3	17.1	18.6
		C30/37 [kN]	2.9	4.4	9.3	15.0	20.9	22.7
		C40/50 [kN]	3.4	5.0	10.7	17.3	24.2	26.2
		C50/60 [kN]	3.7	5.5	11.8	19.0	26.2	28.8
	Non-Cracked Concrete ³⁾	C20/25 [kN]	3.0	4.8	9.5	17.2	24.0	31.6
		C30/37 [kN]	3.6	5.8	11.6	21.0	29.3	38.5
		C40/50 [kN]	4.2	6.7	13.4	24.2	33.8	44.5
		C50/60 [kN]	4.6	7.4	14.8	26.2	37.2	48.9

Permissible shear loads^{1) 2)}

V_{perm}								
			M6	M8	M10	M12	M16	M20 ⁶⁾
	Cracked Concrete	C20/25 [kN]	5.2	7.0	20.1	24.5	34.3	49.2
		C30/37 [kN]	6.3	8.5	22.3	29.8	41.7	59.8
		C40/50 [kN]	7.3	9.9	22.3	34.3	48.5	69.6
		C50/60 [kN]	8.0	10.8	22.3	34.3	53.1	76.3
	Non-Cracked Concrete ³⁾	C20/25 [kN]	7.2	9.8	22.3	34.3	48.0	68.9
		C30/37 [kN]	8.6	11.9	22.3	34.3	54.9	80.6
		C40/50 [kN]	8.6	13.8	22.3	34.3	54.9	80.6
		C50/60 [kN]	8.6	14.3	22.3	34.3	54.9	80.6

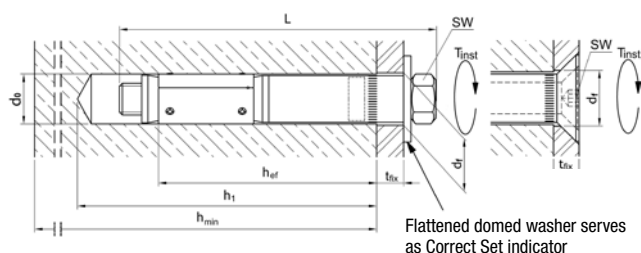
Spacings, edge distances and member thicknesses

			M6	M8	M10	M12	M16	M20 ⁶⁾
Effective embedment depth	h_{ef} [mm]		45	55	70	80	100	125
Characteristic spacing ⁴⁾	$s_{cr,N}$ [mm]		135	165	210	240	300	375
Minimum spacing	s_{min} [mm]		60	100	150	200	250	195
Characteristic edge distance	$c_{cr,N}$ [mm]		67.5	82.5	105	120	150	185
Minimum edge distance ⁵⁾	c_{min} [mm]		80	100	150	200	250	350
Minimum member thickness	h_{min} [mm]		100	110	140	160	200	250

Installation data

			M6	M8	M10	M12	M16	M20 ⁶⁾
Drill hole diameter	d_0 [mm]		10	12	15	20	25	30
Drill hole depth	h_1 [mm]		60	70	85	100	125	150
Clearance hole in the fixture	Through-fix anchorage	d_f [mm]	12	14	17	21	26	32
Width across flat	S	sw [mm]	10	13	17	19	24	32
	SK	sw [mm]	4	5	6	8	10	-
Installation torque	S	T_{inst} [Nm]	8	20	60	90	170	300
	SK	T_{inst} [Nm]	12	20	60	90	190	-

Installed anchor



- 1) The permissible loads have been calculated using the partial safety factors for resistances stated in the ETA-approval and a partial safety factor for actions of $\gamma_c = 1.4$. The permissible loads are valid for unreinforced concrete and reinforced concrete with a rebar spacing $s \geq 15$ cm and reinforced concrete with a rebar spacing $s \geq 10$ cm if the rebar is 10 mm or smaller.
- 2) The permissible shear loads are based on a single anchor without influencing concrete edges. For shear loads applied close to an edge ($c \leq 10 h_{ef}$ or $60d$) concrete edge failure must be checked per ETAG 001, Annex C, design method A.
- 3) Concrete is considered non-cracked when the tensile stress within the concrete is $\sigma_1 + \sigma_2 \leq 0$. In the absence of detailed verification $\sigma_R = 3$ N/mm² can be assumed (σ_1 equals the tensile stress within the concrete as a result of external loads, forces on anchors included).
- 4) For spacings smaller than the characteristic values (i.e. $s \leq s_{cr,N}$) a calculation per ETAG 001, Annex C, design method A shall be performed. For details, see ETA-06/0108.
- 5) The actual edge distance shall not be less than the value of c_{min} shown in the table.
- 6) Size M20 is not included in the approval.

SAFETY BOLT B A4 stainless steel

Threaded stud with hex nut and domed washer

Material: A4 stainless steel



New Type	Old Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
B M6-10/45/5 A4	B 10/20 A4	B0610045005A4	M6	10 x 60	5	12	45	70	2.7	50
B M6-10/45/15 A4	B 10/35 A4	B0610045015A4	M6	10 x 60	15	12	45	80	3.4	50
B M6-10/45/40 A4	B 10/60 A4	B0610045040A4	M6	10 x 60	40	12	45	105	4.6	50
B M8-12/55/5 A4	B 12/25 A4	B0812055005A4	M8	12 x 70	5	14	55	85	5.8	25
B M8-12/55/15 A4	B 12/40 A4	B0812055005A4	M8	12 x 70	15	14	55	95	7.0	25
B M8-12/55/40 A4	B 12/65 A4	B0812055040A4	M8	12 x 70	40	14	55	120	9.0	25
B M10-15/70/5 A4	B 15/30 A4	B1015070005A4	M10	15 x 85	5	17	70	100	11.0	25
B M10-15/70/15 A4	B 15/45 A4	B1015070015A4	M10	15 x 85	15	17	70	110	12.8	25
B M10-15/70/40 A4	B 15/70 A4	B1015070040A4	M10	15 x 85	40	17	70	135	16.0	10
B M12-20/80/5 A4	B 20/35 A4	B1220080005A4	M12	20 x 95	5	21	80	120	20.8	10
B M12-20/80/15 A4	B 20/50 A4	B1220080015A4	M12	20 x 95	15	21	80	130	24.8	10
B M12-20/80/40 A4	B 20/75 A4	B1220080040A4	M12	20 x 95	40	21	80	155	29.0	10
B M16-25/100/5 A4	B 25/55 A4	B1625100015A4	M16	25 x 125	15	26	100	160	48.4	5
B M16-25/100/15 A4	B 25/80 A4	B1625100040A4	M16	25 x 125	40	26	100	185	56.7	5
B M20-30/125/40 A4	B 30/90 A4	B2030125040A4	M20	30 x 150	40	32	125	205	96.7	5

SAFETY BOLT S A4 stainless steel

Hex head screw and domed washer

Material: A4 stainless steel



New Type	Old Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
S M6-10/45/15 A4	S 10/35 A4	S0610045015A4	M6	10 x 60	15	12	45	80	3.4	50
S M6-10/45/40 A4	S 10/60 A4	S0610045040A4	M6	10 x 60	40	12	45	105	4.6	50
S M8-12/55/15 A4	S 12/40 A4	S0812055015A4	M8	12 x 70	15	14	55	90	7.0	25
S M8-12/55/40 A4	S 12/65 A4	S0812055040A4	M8	12 x 70	40	14	55	115	9.0	25
S M10-15/70/15 A4	S 15/45 A4	S1015070015A4	M10	15 x 85	15	17	70	105	12.8	25
S M10-15/70/40 A4	S 15/70 A4	S1015070040A4	M10	10 x 60	40	17	70	130	16.0	10
S M12-20/80/15 A4	S 20/50 A4	S1220080015A4	M12	20 x 95	15	21	80	123	24.8	10
S M12-20/80/40 A4	S 20/75 A4	S1220080040A4	M12	20 x 95	40	21	80	148	29.0	10

SAFETY BOLT SK A4 stainless steel

Hex head screw and domed washer

Material: A4 stainless steel



New Type	Old Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
SK M6-10/45/15 A4	SK 10/35 A4	SK0610045015A4	M6	10 x 60	15	12	45	70	3.4	50
SK M6-10/45/40 A4	SK 10/60 A4	SK0610045040A4	M6	10 x 60	40	12	45	95	4.6	50
SK M8-12/55/15 A4	SK 12/40 A4	SK0812055015A4	M8	12 x 70	15	14	55	85	7.0	25
SK M8-12/55/40 A4	SK 12/65 A4	SK0812055040A4	M8	12 x 70	40	14	55	110	9.0	25
SK M10-15/70/15 A4	SK 15/45 A4	SK1015070015A4	M10	15 x 85	15	17	70	100	12.8	25
SK M10-15/70/40 A4	SK 15/70 A4	SK1015070040A4	M10	10 x 60	40	17	70	125	16.0	25
SK M12-20/80/15 A4	SK 20/50 A4	SK1220080015A4	M12	20 x 95	15	21	80	110	24.8	10
SK M12-20/80/40 A4	SK 20/75 A4	SK1220080040A4	M12	20 x 95	40	21	80	135	29.0	10

TECHNICAL DATA A4 stainless steel

Permissible loads for single anchors with no influencing edge distances or spacings. Loads are calculated using partial safety factors from ETAG 001 and the characteristic anchor and installation data from this catalogue.

Material: A4 stainless steel (Type B), A4 stainless steel (Type S, SK)

Thread Size	M6	M8	M10	M12	M16	M20
Effective embedment depth (h_{ef}) (mm)	45	55	70	80	100	125
Type B.... S.... SK...	M6-10/45/...	M8-12/55/...	M10-15/70/...	M12-20/80/...	M16-25/100/...	M20-30/125/...

Permissible tension loads¹⁾

N_{perm}			[kN]	M6		M8		M10		M12		M16		M20	
				B	S/SK	B	S/SK	B	S/SK	B	S/SK	B	S/SK		
	Cracked Concrete	C20/25	[kN]	-	-	-	-	7.1	10.7	15.5					
		C30/37	[kN]	-	-	-	-	8.4	12.6	18.3					
		C40/50	[kN]	-	-	-	-	9.5	14.3	20.8					
		C50/60	[kN]	-	-	-	-	10.5	15.8	22.9					
	Non-Cracked Concrete ³⁾	C20/25	[kN]	3.2	4.3	7.1	10.7	16.0	23.2						
		C30/37	[kN]	3.9	5.2	8.6	12.6	18.8	27.4						
		C40/50	[kN]	4.5	6.1	10.0	14.3	21.4	31.1						
		C50/60	[kN]	5.0	6.7	11.0	15.8	23.7	34.3						

Permissible shear loads^{1) 2)}

V_{perm}			[kN]	M6		M8		M10		M12		M16		M20	
				B	S/SK	B	S/SK	B	S/SK	B	S/SK	B	S/SK		
	Cracked Concrete	C20/25	[kN]	-	-	-	-	20.5	20.5	28.6	28.6	39.9	39.9		
		C30/37	[kN]	-	-	-	-	24.2	24.2	33.7	33.7	47.1	47.1		
		C40/50	[kN]	-	-	-	-	27.5	24.6	38.3	38.3	53.5	53.5		
		C50/60	[kN]	-	-	-	-	28.9	24.6	42.3	41.5	59.1	59.1		
	Non-Cracked Concrete ³⁾	C20/25	[kN]	3.2	4.3	7.1	10.7	28.7	24.6	40.0	40.0	55.9	55.9		
		C30/37	[kN]	3.9	5.2	8.6	12.6	28.9	24.6	47.2	41.5	66.0	61.6		
		C40/50	[kN]	4.5	6.1	10.0	14.3	28.9	24.6	49.5	41.5	67.4	61.6		
		C50/60	[kN]	5.0	6.7	11.0	15.8	28.9	24.6	49.5	41.5	67.4	61.6		

Permissible bending moments^{1) 4)}

M_{perm}	[Nm]	M6	M8	M10	M12	M16	M20
		6.5	16.1	32.1	56.1	142.7	278.1

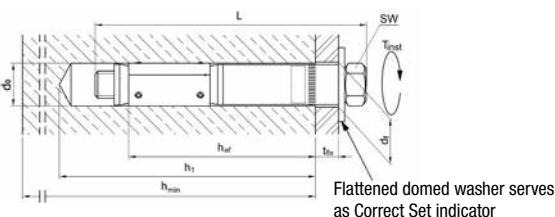
Spacings, edge distances and member thicknesses

		M6	M8	M10	M12	M16	M20
Effective embedment depth	h_{ef} [mm]	45	55	70	80	100	125
Characteristic spacing ⁵⁾	$s_{cr,N}$ [mm]	140	165	235	240	300	375
Minimum spacing	s_{min} [mm]	140	165	235	120	150	195
Characteristic edge distance	$c_{cr,N}$ [mm]	80	120	165	120	150	195
Minimum edge distance ⁶⁾	c_{min} [mm]	80	120	165	210	270	350
Minimum member thickness	h_{min} [mm]	100	110	140	150	200	250

Installation data

			M6	M8	M10	M12	M16	M20
Drill hole diameter	d_0 [mm]		10	12	15	20	25	30
Drill hole depth	h_1 [mm]		60	70	85	95	125	150
Clearance hole in the fixture	Through-fix anchorage	d_f [mm]	12	14	17	21	26	32
	Installation on threaded stud	d_f [mm]	7	9	12	14	18	22
Width across flat	B	sw [mm]	10	13	17	19	24	30
	S	sw [mm]	10	13	17	19	-	-
	SK	sw [mm]	4	5	6	8	-	-
Installation torque	B	T_{inst} [Nm]	10	25	50	80	180	300
	S	T_{inst} [Nm]	10	25	50	80	-	-
	SK	T_{inst} [Nm]	10	25	50	80	-	-

Installed anchor



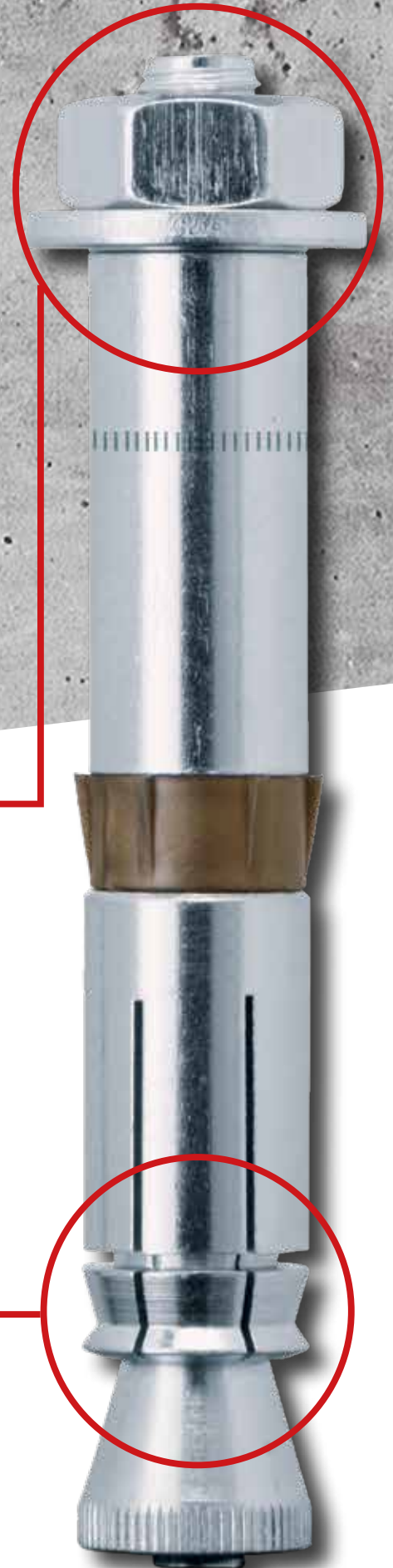
- The permissible loads have been calculated using partial safety factors for resistances and a partial safety factor for actions of $\gamma_F = 1.4$. The permissible loads are valid for unreinforced concrete and reinforced concrete with a rebar spacing $s \geq 15$ cm and reinforced concrete with a rebar spacing $s \geq 10$ cm if the rebar is 10 mm or smaller.
- The permissible shear loads are based on a single anchor without influencing concrete edges. For shear loads applied close to an edge ($c \leq 10 h_{ef}$ or $60d$) concrete edge failure must be checked per ETAG 001, Annex C, design method A.
- Concrete is considered non-cracked when the tensile stress within the concrete is $\sigma_t + \sigma_a \leq 0$. In the absence of detailed verification $\sigma_a = 3$ N/mm² can be assumed (σ_t equals the tensile stress within the concrete as a result of external loads, forces on anchors included).
- The permissible bending moments are only valid for the threaded stud (e.g. in case of a distance mounting).
- For spacings smaller than the characteristic values (i.e. $s \leq s_{cr,N}$) a calculation per ETAG 001, Annex C, design method A shall be performed.
- The actual edge distance shall not be less than the value of c_{min} shown in the table.

SUPERPLUS M8-M16

The undercut fixing system that does not require a special setting tool.

FUNCTION

Automatic self-undercutting. The unique design of the SUPERPLUS causes an undercut to be created when the installation torque is applied. The sleeve's outer cutting teeth expand and undercut into the base material. This results in a durable mechanical interlock with base material that functions in both cracked and non-cracked concrete.

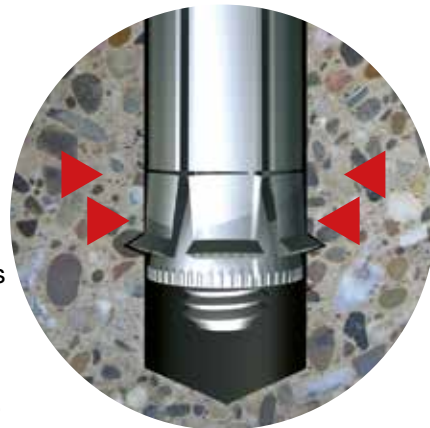


BENEFITS

- High capacity anchor for cracked and non-cracked concrete
- Increased reliability due to undercut technology
- Simple installation, no special drill bit or setting tool required
- Applying torque creates undercut
- Two approved embedment depths per diameter
- Lower installed cost than traditional undercut anchors
- Reduced edge distances and spacings
- Approved for fire resistance
- Custom lengths available on request



European technical approval ETA-001/0011 option1



CONSTRUCTION

BLS With hex nut, washer and threaded stud



BLS-P With hex nut, washer and threaded stud



ILS With internally threaded sleeve



MATERIAL

Grade 8.8 carbon steel, zinc plated
A4-80 stainless steel

BASE MATERIAL

Cracked and non-cracked concrete: C20/25 to C50/60

APPROVAL

ETA-01/0011 – Option 1 – Carbon steel, zinc plated, A4 stainless steel

LOAD RANGE

Tension: $N_{perm} = 4.3 - 56.1$ [kN]
Shear: $V_{perm} = 4.3 - 90.7$ [kN]

PRODUCT RANGE

BLS: M8, M12 and M16, carbon steel, zinc plated / A4 stainless steel
BLS-P: M8, M12 and M16, carbon steel, zinc plated / A4 stainless steel
ILS: M8, carbon steel, zinc plated

APPLICATIONS

- Power plants
- Machines
- Steel and industrial plants
- Façades
- Structural Steel work
- Base plates
- Nuclear

BENEFITS

- High tension and shear capacity
- Reduced edge distances and spacings
- Simple self-undercutting installation
- Two embedment depths per diameter
- No special drill bit or setting tool required
- Shallow embedment depths

PRODUCT DESCRIPTION

The **LIEBIG SUPERPLUS** is available in zinc plated carbon steel and A4 stainless steel. Its design offers the high load capacity and reliability of an undercut anchor, but with the ease of installation of an expansion anchor. In contrast to competing undercut anchor systems, the **SUPERPLUS** does not require special drill bits or setting tools. You need only apply the torque to create the self-undercut.



European technical approval option1

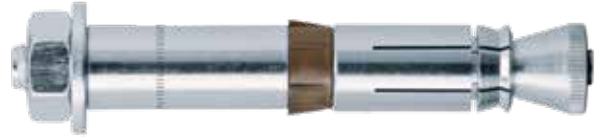


SUPERPLUS M8-M16

Custom lengths available on request.

SUPERPLUS BLS/BLS-P Carbon Steel Zinc Plated

Threaded stud with hex nut and washer
 Material: Grade 8.8 carbon steel, zinc plated
 Approval: ETA- 01/0011 Option 1

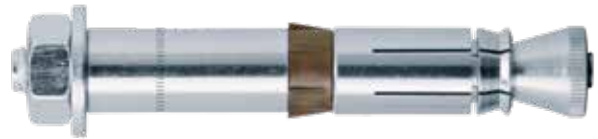


Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
BLS M8-14/40/15	BLS0814040015	M8	14 x 60	15	16	40	80	8.0	25
BLS M8-14/80/25	BLS0814080025	M8	14 x 100	25	16	80	130	13.4	25
BLS M12-20/80/15	BLS1220080015	M12	20 x 105	15	21	80	130	26.5	10
BLS M12-20/80/30	BLS1220080030	M12	20 x 105	30	21	80	145	29.5	10
BLS M12-20/150/30	BLS1220150030	M12	20 x 175	30	21	150	215	43.5	10
BLS M12-20/150/50	BLS1220150050	M12	20 x 175	50	21	150	235	46.0	10
BLS M16-25/150/30	BLS1625150030	M16	25 x 185	30	26	150	220	70.0	10
BLS M16-25/150/40	BLS1625150040	M16	25 x 185	40	26	150	230	72.0	10
BLS M16-25/150/60	BLS1625150060	M16	25 x 185	60	26	150	250	76.0	10
BLS M16-25/200/40	BLS1625200040	M16	25 x 235	40	26	200	280	89.0	10
BLS M16-25/200/60	BLS1625200060	M16	25 x 235	60	26	200	300	95.0	10

*Not included in approval. Available as special order.

SUPERPLUS BLS/BLS-P A4 Stainless Steel

Threaded stud with hex nut and washer
 Material: A4 stainless steel
 Approvals: ETA-05/0013 – Option 1



Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
BLS M8-14/80/25A4	BLS0814080025A4	M8	14 x 100	25	16	80	130	13.4	25
BLS M12-20/80/15A4	BLS1220080015A4	M12	20 x 105	15	21	80	130	26.5	10
BLS M12-20/80/30A4	BLS1220080030A4	M12	20 x 105	30	21	80	145	29.5	10
BLS M16-25/150/30A4	BLS1625150030A4	M16	25 x 185	30	26	150	220	70.0	10
BLS M16-25/150/40A4	BLS1625150040A4	M16	25 x 185	40	26	150	230	72.0	10

SUPERPLUS ILS Internally threaded, Carbon steel, zinc plated

Internally threaded sleeve
 Material: Grade 8.8 carbon steel, zinc plated



Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
ILS M8-14/80	ILS0814080	M8	14 x 100	-	10	80	93	8.7	25

TECHNICAL DATA Carbon Steel Zinc Plated

Permissible loads for single anchors with no influencing edge distances or spacings. Loads are calculated using partial safety factors from ETAG 001 and the characteristic anchor and installation data from this catalogue. Design calculations shall follow the requirements of ETA-01/0011.

Material: Carbon steel, Grade 8.8, zinc plated

Thread Size	M8	M8	M12	M12	M16	M16
Effective embedment depth (h_{ef}) (mm)	40	80	80	150	150	200
Type BLS...	M8-14/40/...	M8-14/80/...	M12-20/80/...	M12-20/150/...	M16-25/150/...	M16-25/200/...

Permissible tension loads¹⁾

N_{perm}		Concrete	[kN]	M8		M12		M16	
				Cracked	Non-Cracked ³⁾	Cracked	Non-Cracked ³⁾	Cracked	Non-Cracked ³⁾
	Cracked Concrete	C20/25	[kN]	4.3	7.6	11.9	19.0	23.8	35.7
		C30/37	[kN]	5.2	9.3	14.5	23.2	29.0	43.6
		C40/50	[kN]	6.0	10.7	16.8	26.9	33.6	50.4
		C50/60	[kN]	6.6	10.8	18.5	28.4	36.9	53.0
	Non-Cracked Concrete ³⁾	C20/25	[kN]	6.1	10.8	17.2	28.4	44.1	53.0
		C30/37	[kN]	7.4	10.8	21.0	28.4	53.0	53.0
		C40/50	[kN]	8.6	10.8	24.3	28.4	53.0	53.0
		C50/60	[kN]	9.4	10.8	26.7	28.4	53.0	53.0

Permissible shear loads^{1) 2)}

V_{perm}		Concrete	[kN]	M8		M12		M16	
				Cracked	Non-Cracked ³⁾	Cracked	Non-Cracked ³⁾	Cracked	Non-Cracked ³⁾
	Cracked Concrete	C20/25	[kN]	4.3	23.7	24.6	40.0	63.0	67.4
		C30/37	[kN]	5.3	23.7	30.0	40.0	67.4	67.4
		C40/50	[kN]	6.1	23.7	34.6	40.0	67.4	67.4
		C50/60	[kN]	6.7	23.7	38.1	40.0	67.4	67.4
	Non-Cracked Concrete ³⁾	C20/25	[kN]	6.1	23.7	34.4	40.0	67.4	67.4
		C30/37	[kN]	7.4	23.7	40.0	40.0	67.4	67.4
		C40/50	[kN]	8.6	23.7	40.0	40.0	67.4	67.4
		C50/60	[kN]	9.4	23.7	40.0	40.0	67.4	67.4

Permissible bending moments^{1) 4)}

M_{perm}	[Nm]	M8	M8	M12	M12	M16	M16
		17.1	17.1	60.0	60.0	152.0	152.0

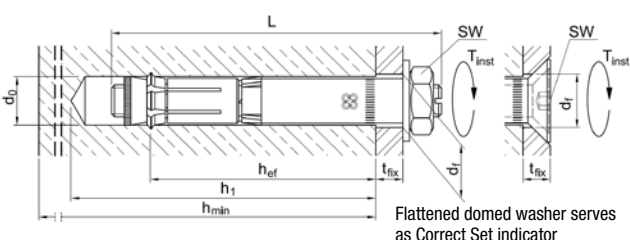
Spacings, edge distances and member thicknesses

Parameter	Symbol	Unit	M8	M8	M12	M12	M16	M16
Effective embedment depth	h_{ef}	[mm]	40	80	80	150	150	200
Characteristic spacing ⁵⁾	$s_{cr,N}$	[mm]	120	240	240	450	450	600
Minimum spacing	s_{min}	[mm]	100	80	120	150	200	150
Characteristic edge distance ⁵⁾	$c_{cr,N}$	[mm]	60	120	125	225	225	300
Minimum edge distance	c_{min}	[mm]	80	50	100	80	150	100
Minimum member thickness	h_{min}	[mm]	100	160	160	300	300	400

Installation data

Parameter	Symbol	Unit	M8	M8	M12	M12	M16	M16	
Drill hole diameter	d_0	[mm]	14	14	20	20	25	25	
Drill hole depth	h_1	[mm]	60	100	105	175	185	235	
Clearance hole in the fixture	Through-fix anchorage	d_f	[mm]	16	16	21	21	26	26
	Installation on threaded stud	d_f	[mm]	10	18	14	14	18	18
Width across flats	sw	[mm]	17	17	22	22	27	27	
Installation torque	T_{inst}	[Nm]	25	25	80	80	180	180	

Installed anchor



1) The permissible loads have been calculated using the partial safety factors for resistances stated in the ETA-approval and a partial safety factor for actions of $\gamma_F = 1.4$. The permissible loads are valid for unreinforced concrete and reinforced concrete with a rebar spacing $s \geq 15$ cm and reinforced concrete with a rebar spacing $s \geq 10$ cm if the rebar is 10 mm or smaller.

2) The permissible shear loads are based on a single anchor without influencing concrete edges. For shear loads applied close to an edge ($c \leq 10 h_{ef}$ or $60 d$) concrete edge failure must be checked per ETAG 001, Annex C, design method A.

3) Concrete is considered non-cracked when the tensile stress within the concrete is $\sigma_t + \sigma_a \leq 0$. In the absence of detailed verification $\sigma_t = 3$ N/mm² can be assumed (σ_t equals the tensile stress within the concrete as a result of external loads, forces on anchors included).

4) The permissible bending moments are only valid for the threaded stud (e.g. in case of a distance mounting).

5) If spacings or edge distances become smaller than the characteristic values (i.e. $s \leq s_{cr,N}$ and/or $c \leq c_{cr,N}$) a calculation per ETAG 001, Annex C, design method A must be performed.

For details, see ETA-01/0011.

TECHNICAL DATA A4 Stainless Steel

Permissible loads for single anchors with no influencing edge distances or spacings. Loads are calculated using partial safety factors from ETAG 001 and the characteristic anchor and installation data from this catalogue. Design calculations shall follow the requirements of ETA-05/0013.

Material: A4 stainless steel

Thread Size	M8	M8	M12	M12	M16	M16
Effective embedment depth (h_{ef}) (mm)	40	80	80	150	150	200
Type BLS...	M8-14/40/...	M8-14/80/...	M12-20/80/...	M12-20/150/...	M16-25/150/...	M16-25/200/...

Permissible tension loads¹⁾

N_{perm}	Concrete	Concrete Class	[kN]	M8		M12		M16	
				Cracked	Non-Cracked ³⁾	Cracked	Non-Cracked ³⁾	Cracked	Non-Cracked ³⁾
	Cracked Concrete	C20/25 [kN]	4.3	5.7	11.9	19.0	23.8	28.6	
		C30/37 [kN]	5.2	7.0	14.5	23.2	34.9	34.9	
		C40/50 [kN]	6.0	8.1	16.8	26.9	40.3	40.3	
		C50/60 [kN]	6.6	8.9	18.5	29.5	44.3	44.3	
	Non-Cracked Concrete ³⁾	C20/25 [kN]	6.1	13.1	17.2	30.1	44.1	56.1	
		C30/37 [kN]	7.4	13.1	21.0	30.1	53.8	56.1	
		C40/50 [kN]	8.6	13.1	24.3	30.1	56.1	56.1	
		C50/60 [kN]	9.4	13.1	26.7	30.1	56.1	56.1	

Permissible shear loads^{1) 2)}

V_{perm}	Concrete	Concrete Class	[kN]	M8		M12		M16	
				Cracked	Non-Cracked ³⁾	Cracked	Non-Cracked ³⁾	Cracked	Non-Cracked ³⁾
	Cracked Concrete	C20/25 [kN]	4.3	24.0	24.6	48.5	63.0	90.7	
		C30/37 [kN]	5.3	24.0	30.0	48.5	76.8	90.7	
		C40/50 [kN]	6.1	24.0	34.6	48.5	88.8	90.7	
		C50/60 [kN]	6.7	24.0	38.1	48.5	90.7	90.7	
	Non-Cracked Concrete ³⁾	C20/25 [kN]	6.1	24.0	34.4	48.5	88.2	90.7	
		C30/37 [kN]	7.4	24.0	42.0	48.5	90.7	90.7	
		C40/50 [kN]	8.6	24.0	48.5	48.5	90.7	90.7	
		C50/60 [kN]	9.4	24.0	48.5	48.5	90.7	90.7	

Permissible bending moments^{1) 4)}

M_{perm}	[Nm]	M8	M8	M12	M12	M16	M16
		16.1	16.1	56.4	56.4	142.9	142.9

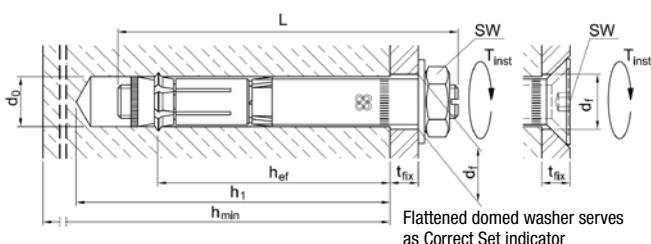
Spacings, edge distances and member thicknesses

Parameter	Symbol	[mm]	M8	M8	M12	M12	M16	M16
Effective embedment depth	h_{ef}	[mm]	40	80	80	150	150	200
Characteristic spacing ⁵⁾	$s_{cr,N}$	[mm]	120	240	240	450	450	600
Minimum spacing	s_{min}	[mm]	100	80	150	150	150	180
Characteristic edge distance ⁵⁾	$c_{cr,N}$	[mm]	60	120	120	225	225	300
Minimum edge distance	c_{min}	[mm]	60	50	100	80	100	100
Minimum member thickness	h_{min}	[mm]	100	160	160	300	300	400

Installation data

Parameter	Symbol	[mm]	M8	M8	M12	M12	M16	M16
Drill hole diameter	d_0	[mm]	14	14	20	20	25	25
Drill hole depth	h_1	[mm]	60	100	105	175	185	235
Clearance hole in the fixture	Through-fix anchorage	d_f	16	16	21	21	26	26
	Installation on threaded stud	d_f	10	10	14	14	18	18
Width across flats	sw	[mm]	17	17	22	22	27	27
Installation torque	T_{inst}	[Nm]	25	25	80	80	180	180

Installed anchor



1) The permissible loads have been calculated using the partial safety factors for resistances stated in the ETA-approval and a partial safety factor for actions of $\gamma_F = 1.4$. The permissible loads are valid for unreinforced concrete and reinforced concrete with a rebar spacing $s \geq 15$ cm and reinforced concrete with a rebar spacing $s \geq 10$ cm if the rebar is 10 mm or smaller.

2) The permissible shear loads are based on a single anchor without influencing concrete edges. For shear loads applied close to an edge ($c \leq 10 h_{ef}$ or $60 d$) concrete edge failure must be checked per ETAG 001, Annex C, design method A.

3) Concrete is considered non-cracked when the tensile stress within the concrete is $\sigma_t + \sigma_c \leq 0$. In the absence of detailed verification $\sigma_c = 3$ N/mm² can be assumed (σ_t equals the tensile stress within the concrete as a result of external loads, forces on anchors included).

4) The permissible bending moments are only valid for the threaded stud (e.g. in case of a distance mounting).

5) If spacings or edge distances become smaller than the characteristic values (i.e. $s \leq s_{cr,N}$ and/or $c \leq c_{cr,N}$) a calculation per ETAG 001, Annex C, design method A must be performed.

For details, see ETA-05/0013.

TECHNICAL DATA Internally threaded anchor, Carbon steel, zinc plated

Permissible loads for single anchors with no influencing edge distances or spacings. Loads are calculated using partial safety factors from ETAG 001 and the characteristic anchor and installation data from this catalogue.

Material: Carbon steel, zinc plated

Thread Size	M8
Effective embedment depth (h_{ef}) (mm)	80
Type ILS...	M8-14/80/...

Permissible tension loads¹⁾

N_{perm}	Cracked Concrete	C20/25	[kN]	7.6
		C30/37	[kN]	9.3
	C40/50	[kN]	10.7	
	C50/60	[kN]	10.8	
	Non-Cracked Concrete ³⁾	C20/25	[kN]	10.8
C30/37		[kN]	10.8	
C40/50		[kN]	10.8	
C50/60		[kN]	10.8	

Permissible shear loads^{1) 2)}

V_{perm}	Cracked Concrete	C20/25	[kN]	8.4
		C30/37	[kN]	8.4
	C40/50	[kN]	8.4	
	C50/60	[kN]	8.4	
	Non-Cracked Concrete ³⁾	C20/25	[kN]	8.4
C30/37		[kN]	8.4	
C40/50		[kN]	8.4	
C50/60		[kN]	8.4	

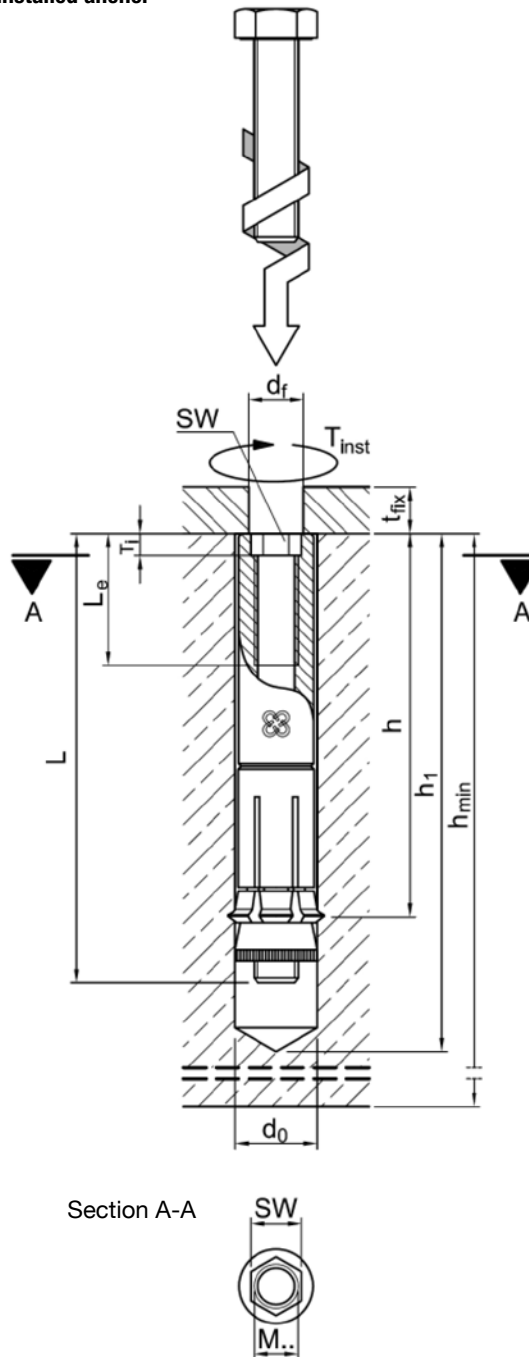
Spacings, edge distances and member thicknesses

Effective embedment depth	h_{ef}	[mm]	80
Characteristic spacing ⁴⁾	$s_{cr,N}$	[mm]	240
Minimum spacing	s_{min}	[mm]	80
Characteristic edge distance ⁴⁾	$c_{cr,N}$	[mm]	120
Minimum edge distance	c_{min}	[mm]	50
Minimum member thickness	h_{min}	[mm]	160

Installation data

Drill hole diameter	d_0	[mm]	14
Drill hole depth	h_1	[mm]	100
Clearance hole in the fixture	d_f	[mm]	10
Threaded depth	L_e	[mm]	12 to 23
Hexagon socket depth	T_i	[mm]	4
Width across flats	sw	[mm]	8
Installation torque	T_{inst}	[Nm]	25

Installed anchor



1) The permissible loads have been calculated assuming that grade 8.8 fasteners are used and using the partial safety factors for resistances stated in ETA-01/0011 and a partial safety factor for actions of $\gamma_F = 1.4$. The permissible loads are valid for unreinforced concrete and reinforced concrete with a rebar spacing $s \geq 15$ cm and reinforced concrete with a rebar spacing $s \geq 10$ cm if the rebar is 10 mm or smaller.

2) The permissible shear loads are based on a single anchor without influencing concrete edges. For shear loads applied close to an edge ($c \leq 10 h_e$ or $60 d$) concrete edge failure must be checked per ETAG 001, Annex C, design method A.

3) Concrete is considered non-cracked when the tensile stress within the concrete is $\sigma_t + \sigma_r \leq 0$. In the absence of detailed verification $\sigma_r = 3$ N/mm² can be assumed (σ_t equals the tensile stress within the concrete as a result of external loads, forces on anchors included).

4) If spacings or edge distances become smaller than the characteristic values (i.e. $s \leq s_{cr,N}$ and/or $c \leq c_{cr,N}$) a calculation per ETAG 001, Annex C, design method A must be performed.

For details, see ETA-01/0011.

Custom lengths available on request.

BLS M8-14/40SA A4 Step Iron Anchor, A4 stainless steel

Threaded stud with hex nut and special plastic sleeve

Material: A4 stainless steel

Approvals: ETA-05/0013 - Option 1, Expert Report AZ.: 05003



Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Max Fixture Thickness	Fixture Hole Diameter	Eff. Embedment Depth	Total Length	Weight (kg/100pcs)	Box Quantity
BLS M8-14/40SA A4	BLS0814040SAA4	M8	14 x 60	20	16	40	85	9.0	25

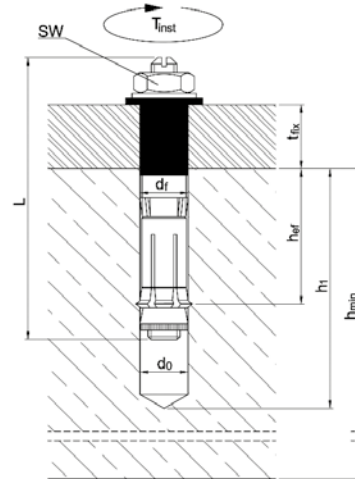
TECHNICAL DATA

Type	BLS M8-14/40SA A4		
Thread size			M8
Eff. embedment depth	h_{ef}	[mm]	40
Min. edge distance	c_{min}	[mm]	60
Min. member thickness	h_{min}	[mm]	100

Installation data

Drilled hole diameter	d_0	[mm]	14
Drilled hole depth	h_1	[mm]	60
Step iron thickness	t_{fix}	[mm]	20
Step iron hole diameter	d_f	[mm]	16
Wrench size	sw	[mm]	17
Installation torque	T_{inst}	[Nm]	25

Installed anchor



BLS M8-14BS85 Lightning Protection Anchor, Carbon steel, zinc plated

Threaded stud with hex nut and washer

Material: Grade 8.8 Carbon steel, zinc plated



Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Total Length	Weight (kg/100pcs)	Box Quantity
BLS M8-14BS85	BLS0814BS085	M8	14 x 40 to 60	85	7.2	25

BLS M8-14BS85 A4 Lightning Protection Anchor, A4 stainless steel

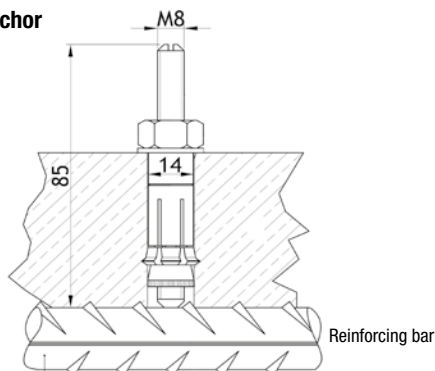
Threaded stud with hex nut and washer

Material: A4 stainless steel

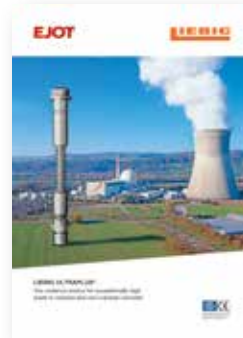


Type	Order Code	Thread Size	Diameter x Depth of drilled hole	Total Length	Weight (kg/100pcs)	Box Quantity
BLS M8-14BS85 A4	BLS0814BS085A4	M8	14 x 40 to 60	85	7.2	25

Installed anchor



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EJOT UK Limited,
Hurricane Close,
Sherburn Enterprise Park,
Sherburn-in-Elmet,
Leeds LS25 6PB.
United Kingdom

Tel: +44 1977 68 70 40

Fax: +44 1977 68 70 41

Email: liebig@ejot.co.uk

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