



# LIEBIG Superplus BLS range

Unique automatic self-undercut anchor offering  
high load capacity with complete reliability

Bringing it together.

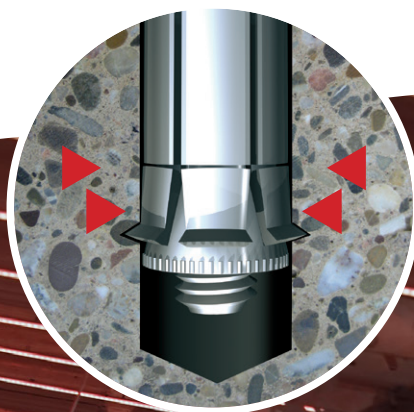
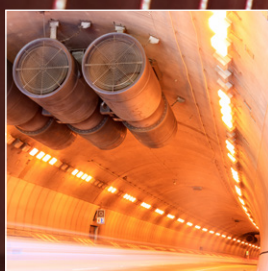


# LIEBIG Superplus BLS range

Unique technology, unrivalled performance

Since 1946, LIEBIG's unique anchoring technology has become synonymous around the world with the highest levels of safety-critical products. And since 2017, the LIEBIG brand has been part of the EJOT Group.

LIEBIG Superplus BLS is the only genuine market-wide self-undercutting anchoring system that does not require special setting tools. Unique in design, the undercut is created when the installation torque is applied, and the sleeve's outer cutting teeth expand into the base material. The result is a high-strength mechanical interlock in both cracked or non-cracked concrete, which has a proven track record in safety-critical applications worldwide.



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# The self-undercut anchor that does not require any special setting tools

**The design principle of the LIEBIG Superplus BLS range is simply unique.**

Available in zinc plated carbon steel and A4 stainless steel, its design offers the high load capacity and reliability of an undercut anchor, with the ease of installation normally associated with an expansion anchor.

That means that, unlike any other competing product, the Superplus range does not require the expense of any special drill bits or setting tools.

## Performance benefits and characteristics

- Unique automatic self-undercut / mechanical interlock anchor
- Very high load performance
- Setting is torque controlled - no special tools required
- Minimal expansion forces allow small spacings and edge distances
- M8 – M16, push-through or pre-installation options
- Two embedment depths per anchor diameter
- Range includes shallow embedment option
- Simplest, quickest and safest solution available
- For static, quasi-static and seismic loads
- UKTA approval
- ETA approval
- ACI 355 Nuclear Performance Standard





#### Type BLS

Stud with nut



#### Type BLS-P

Extended stud with nut



#### Type SLS

Hexagonal bolt



#### Type SKLS

Countersunk screw



#### Type ILS

Internal thread



#### Product material

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

#### Product range

- BLS & BLS-P - M8, M12 and M16  
- zinc plated carbon steel
- ILS: M8  
- zinc plated carbon steel
- BLS (A4), SLS (A4), SKLS (A4)  
- A4 stainless steel
- Effective clamping thickness 0 - 300mm

#### Base material

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

#### Load range

- Tension:  $N_{perm} = 4.3 - 59.8 \text{ kN}$
- Shear:  $V_{perm} = 4.3 - 91.2 \text{ kN}$

#### Typical application area

- Power plants (nuclear, hydroelectric & fossil etc)
- Tunnel ventilation, jet fans
- Tunnel M&E: overhead lines, catenary systems
- Machinery
- Petrochemical and industrial plants
- Façades
- Structural steel work
- Base plates
- Safety barriers and guide rails
- Storage racking
- Lifts and elevator variations
- Cranes and crane rails

#### Approval

- ETA-01/0011 - Option 1  
A4 stainless steel / zinc plated carbon steel
- UKTA - Option 1  
A4 stainless steel / zinc plated carbon steel

# The unique heavy-duty self-undercutting anchor that gives more kN per £!

## How the Superplus BLS principle works

When specified torque is applied, the anchor's cone is pulled upwards causing the sleeve's outer cutting teeth to expand into the base material.

The result is an extremely high strength and durable mechanical interlock with the base material, most commonly cracked or non-cracked concrete.

The localised pressure required to create the interlock means very low expansion forces are created - which in turn means that reduced anchor spacings and edge distances can be achieved.



### Automatic self undercutting segments

Provide positive interlock with base material.



### Anti-rotational keys

Additional friction hold for overhead applications.

### Collapsible centre

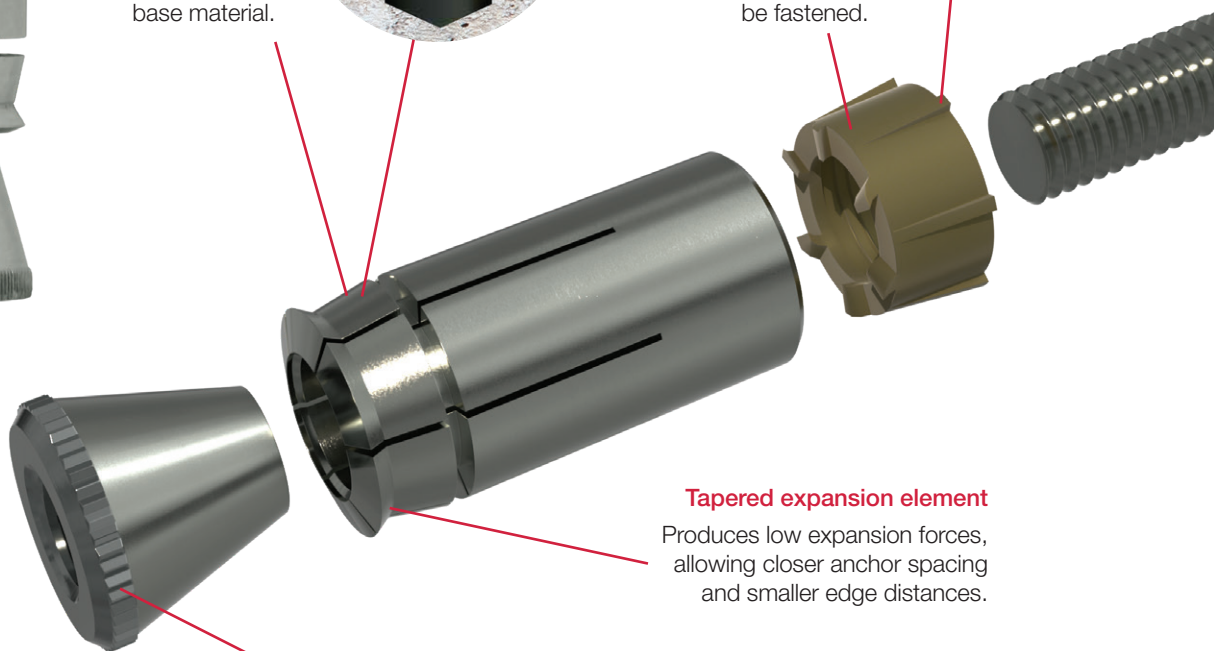
Generates clamping force on the fixture to be fastened.

### Tapered expansion element

Produces low expansion forces, allowing closer anchor spacing and smaller edge distances.

### Anti-rotational grooves

Assist quick and easy installation.





Post-installed anchor



Pre-installed anchor

### Pre-installation / post-installation option

For pre-installed application scenarios, the BLS-P provides an ideal solution due to its extended threaded rod. This is designed to be used where anchor is installed into the concrete and the baseplate is dropped in over the top, prior to torque being applied.

All remaining Superplus BLS, SLS, SKLS and ILS variants provide installers with a very simple push-through installation where drilling and anchor insertion can be made directly through the baseplate.

### Distance sleeve

Provides a higher shear resistance. Design prevents movement during overhead applications.

### Thicker washer / larger nut

Provides improved clamping.

### Threaded rod

In conjunction with the distance sleeve, the threaded rod is customisable allowing for bespoke lengths.

### Depth set indicator

Visual aid for correct, safe and simplified installation check.

### Threaded rod

Grade 8.8 or A4/80 for higher tensile and shear resistance.

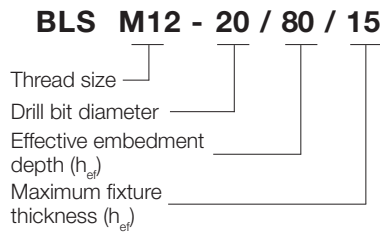
### Modularity means that customised solutions are easily achievable

The modular design of Superplus BLS adds to its flexibility further because bespoke lengths of the main threaded bolt and simple adjustments to the distance sleeve, can be made by EJOT with ease and without significantly adding to cost and lead times.

In reality, very few applications are genuinely standard. The Superplus BLS concept is highly configurable to requirements, rather than expecting the application to be designed to suit the anchor's own characteristics.



# Superplus BLS size range guide

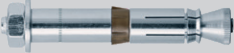

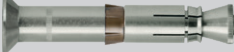


## Standard size range

Thread size	Size - Drill $\phi$ / Anchorage depth $h_{ef}$ / $t_{fix}$	$t_{fix}$	BLS (ZP)	BLS-P (ZP)	BLS (A4)	SLS (A4)	SKLS (A4)	ILS (ZP)
M8	M8-14	-	-	-	-	-	-	-
	M8-14/40/15	15	-	-	•	•	•	-
	M8-14/40	25	-	-	-	-	-	-
	M8-14/60	25	-	-	-	-	-	-
	M8-14/80	-	-	-	-	-	-	NO ETA
M12	M8-14/80/25	25	•	-	•	•	•	-
	M12-20/80/15	15	•	•	•	•	•	-
	M12-20/80/30	30	•	-	•	-	-	-
M16	M12-20/150/30	30	•	•	-	-	-	-
	M16-25/150/30	30	•	-	•	-	-	-
	M16-25/150/40	40	-	•	-	-	-	-
	M16-25/200/40	40	•	•	-	-	-	-
	M16-25/200/60	60	•	-	-	-	-	-

A4 = A4-80 stainless steel ZP = Zinc plated carbon steel

## Special size range

Product Variant		Anchor Diameter	M8		M12		M16	
		Effective Embedment Depth $h_{ef}$	40	80	80	150	150	200
BLS		Max Fixture Thickness $t_{fix}$ (mm)	100	150	200	250	250	300
BLS-P		Max Fixture Thickness $t_{fix}$ (mm)	100	150	200	250	250	300
SKLS		Max Fixture Thickness $t_{fix}$ (mm)	100	150	200	250	250	300

## Other Superplus BLS variants



### Superplus SD

- Push through installations
- Used for fixing step irons.
- A4-80 stainless steel

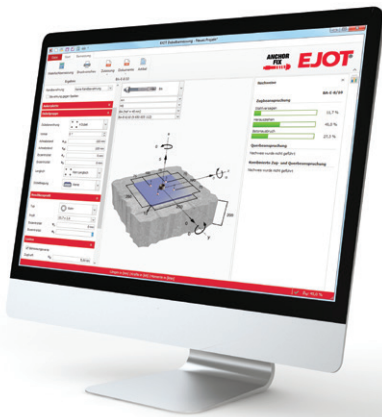


### Superplus LPA

- Retrofitting grounding systems to reduce stray current from rebar
- A4-80 stainless steel

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ENGINEER  
FOR  
DETAILS





## Calculation software

EJOT's Anchor-fix dimensioning software is a 'go-to' tool to assist designers with pre-planning through to specification detailing.

The program was developed for structural engineers, specifiers, engineers and technicians to calculate the load-carrying capacity of anchor bolts in concrete substrates - allowing data to be archived for reference.

Download here:

[www.ejot.com/software-anchorfix](http://www.ejot.com/software-anchorfix)



## On site testing and support





When specifying outside of any standard technical parameters our technical team will recommend an on-site test report, carried out by a qualified EJOT engineer.

No-one can second guess the integrity of substrates. We want our customers to have absolute peace of mind and confidence in the match between fixing and substrate - and the correct installation process.

All of our field-based engineers are CFA approved testers.



## Approvals / certifications / applications

Description of document		Authority / laboratory	ID	Additional info
United Kingdom technical assessment		British Board of Agreement	UKTA-0836-22/6408	
European technical assessment		Centre Scientifique et Technique du Bâtiment	ETA-01-0011	ETAG 001-1 Option 1
Fire resistance		Centre Scientifique et Technique du Bâtiment	ETA-01-0011	EOTA TR 020 - Evaluation of anchorages in concrete concerning resistance to fire
Fire resistance		Centre Scientifique et Technique du Bâtiment	ETA-01-0011	EOTA TR 045 - Design of metal anchors for use in concrete under seismic actions

# Static and quasi-static loads

## Recommended loads

### BLS, BLS-P, SLS, SKLS

The data shown on the following tables is based on:

- ETA / UKTA approved anchors
- Concrete C20/25,  $f_{ck, cube} = 25 \text{ N/mm}^2$
- Installation has been done correctly (see pages 12 and 13)
- Without influence of edge and spacing distances

### Zinc plated carbon steel anchors: BLS, BLS-P

		M8		M12		M16	
Effective anchorage depth $h_{ef}$		40	80	80	150	150	200
Non-cracked concrete							
Tensile $N_{rec}$	kN	6.1	13.9*	17.2	32.1	44.1	59.8*
Shear $V_{rec}$ push through installation	kN	6.1	23.7*	34.4	40.0*	67.4*	67.4*
Shear $V_{rec}$ pre-set through installation (BLS-P)	kN	6.1	8.6	19.3*	19.3*	35.9*	35.9*
Cracked concrete							
Tensile $N_{rec}$	kN	4.3	7.6	11.9	19.0	23.8	35.7
Shear $V_{rec}$ push through installation	kN	4.3	23.7*	24.6	40.0*	63.0	67.4*
Shear $V_{rec}$ pre-set through installation (BLS-P)	kN	4.3	8.6	19.3*	19.3*	35.9*	35.9*
Recommended bending moment $M_{rec,s}$	Nm	17		60		152	

\*Failure mode = steel The partial safety factor for action is  $\gamma = 1.4$

### A4 stainless steel anchors: BLS-A4, BLS-P-A4, SLS-A4, SKLS-A4

		M8		M12		M16	
Effective anchorage depth $h_{ef}$		40	80	80	150	150	200
Non-cracked concrete							
Tensile $N_{rec}$	kN	6.1	13.1*	17.2	30.1*	44.2	56.1*
Shear $V_{rec}$ push through installation	kN	6.1	23.7*	34.4	48.5*	88.4	91.2*
Cracked concrete							
Tensile $N_{rec}$	kN	4.3	5.7	11.9	19.0	28.6	28.6
Shear $V_{rec}$ push through installation	kN	4.3	23.7*	24.5	48.5*	63.0	91.2*
Recommended bending moment $M_{rec,s}$	Nm	16		56		143	

\*Failure mode = steel The partial safety factor for action is  $\gamma = 1.4$

# Fire resistance

## Recommended loads

Design method according to EOTA TR 020

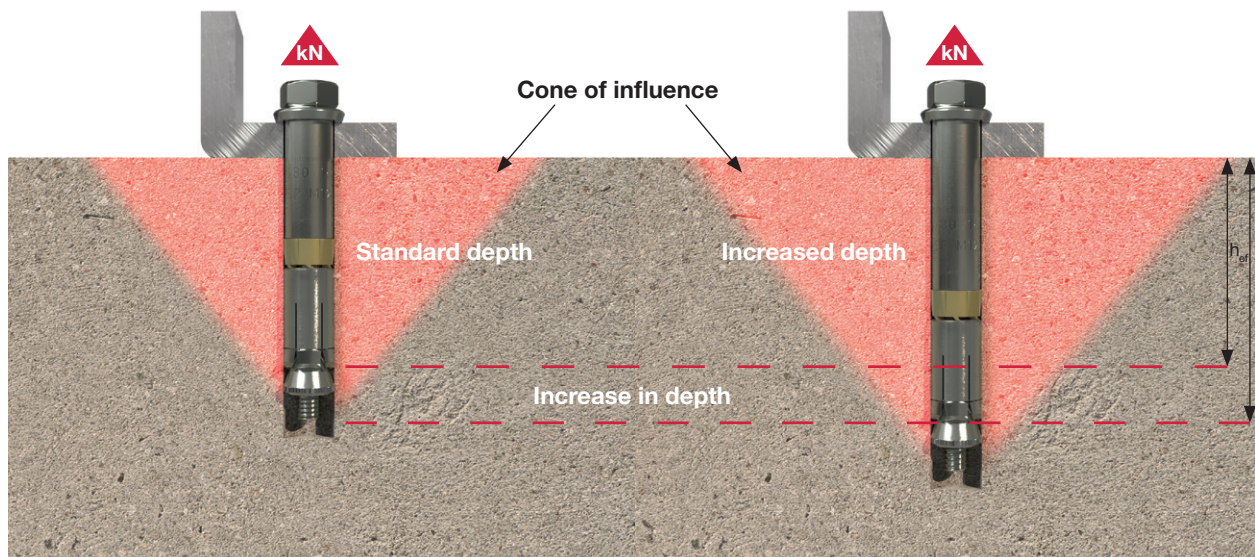
The data of the following table is based on:

- ETA-01/0011: Zinc plated and A4 stainless steel anchors
- UKTA: Zinc plated and A4 stainless steel anchors
- Concrete C20/25,  $f_{ck, cube} = 25 \text{ N/mm}^2$
- Without influence of edge- and spacing distances
- Installation procedure is correct and according to parameters given on pages 12 and 13

			M8		M12		M16	
Effective anchorage depth $h_{ef}$			40	80	80	150	150	200
Cracked and non-cracked concrete								
Zinc plated	R30	Tensile $N_{rec}$	kN	0.37		1.70		3.10
		Shear $V_{rec}$	kN	0.37		1.70		3.10
	R120	Tensile $N_{rec}$	kN	0.18		0.84		1.60
		Shear $V_{rec}$	kN	0.18		0.84		1.60
A4 stainless steel	R30	Tensile $N_{rec}$	kN	0.73		2.50		4.70
		Shear $V_{rec}$	kN	0.73		2.50		4.70
	R120	Tensile $N_{rec}$	kN	0.37		1.30		2.50
		Shear $V_{rec}$	kN	0.37		1.30		2.50

In absence of other national regulations the partial safety factor for resistance under fire exposure  $\gamma_{M,FI} = 1.0$  is recommended

## Cone of influence



The above diagram shows how increasing the effective embedment depth of the anchor achieves a greater cone of influence and a greater resistance from the concrete which results in a greater tensile resistance from the anchorage.



# Installation data

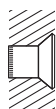
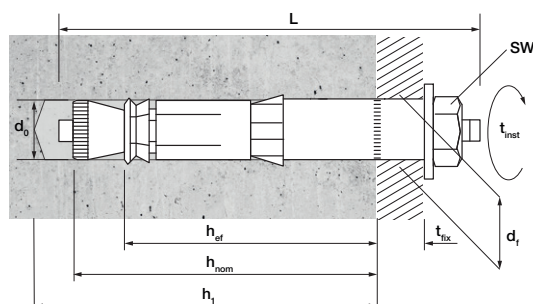
## BLS, BLS-P, BLS-A4, SD(M8), SLS-A4, SKLS-A4

		M8		M12		M16		
Parameters and anchor sizes								
Effective anchorage depth $h_{ef}$		mm	40	80	80	150	150	200
Nominal anchorage depth $h_{nom}$		mm	52	92	96	166	168	218
Drill hole diameter $d_0$		mm	14		20		25	
Diameter of the drill bit at the upper tolerance limit $d_{cut,max} \leq$		mm	14.50		20.55		25.55	
Depth of drilled hole to deepest point $h_1 \geq$		mm	60	100	105	175	185	235
Diameter of clearance hole in the fixture	In-place installation (BLS) $d_f \leq$	mm	16		21		26	
	Mounting on the threaded bolt (BLS-P /dist. Mounting) $d_f \leq$		10		14		18	
Installation torque $T_{inst}$		Nm	25		80		180	
Minimum thickness of base material $h_{inst}$		mm	100	160	160	300	300	400

## Push-through installation

### BLS, BLS-A4, SLS-A4, SKLS-A4

- BLS and SD versions installed through fixture using an ordinary hammer and tightened to specified torque.



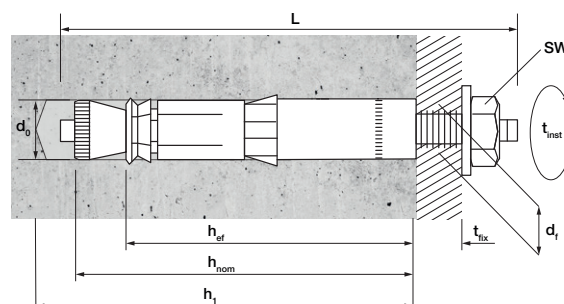
### SKLS-A4

- Hex drive.

## Pre-set installation

### BLS-P

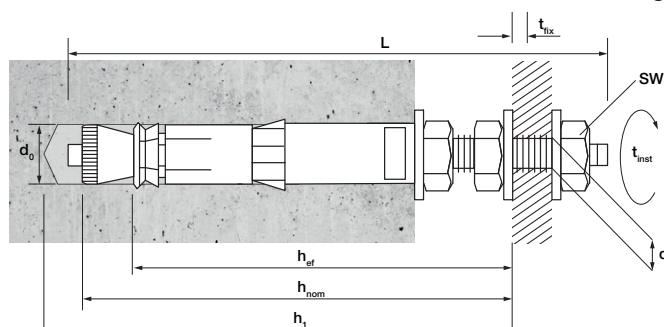
- BLS-P versions installed into the drill-hole using an ordinary hammer. Then, nut and washer are removed, fixture installed, washer and nut installed, and tightened to the specified torque.



## Distance mounting

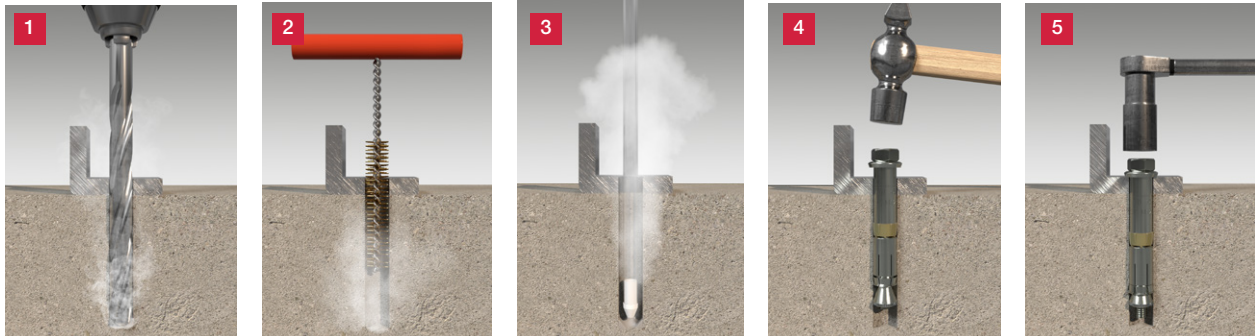
### BLS-P

- BLS-P anchors can be used for distance mountings.

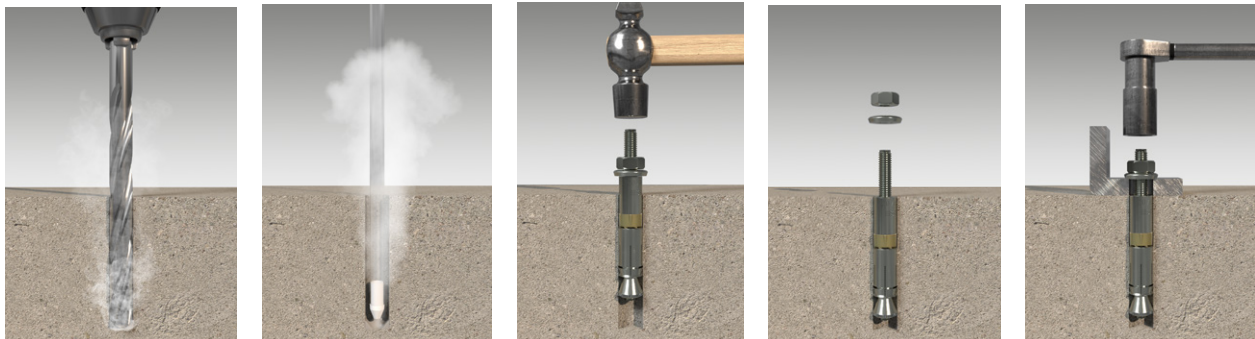


# Installation instructions

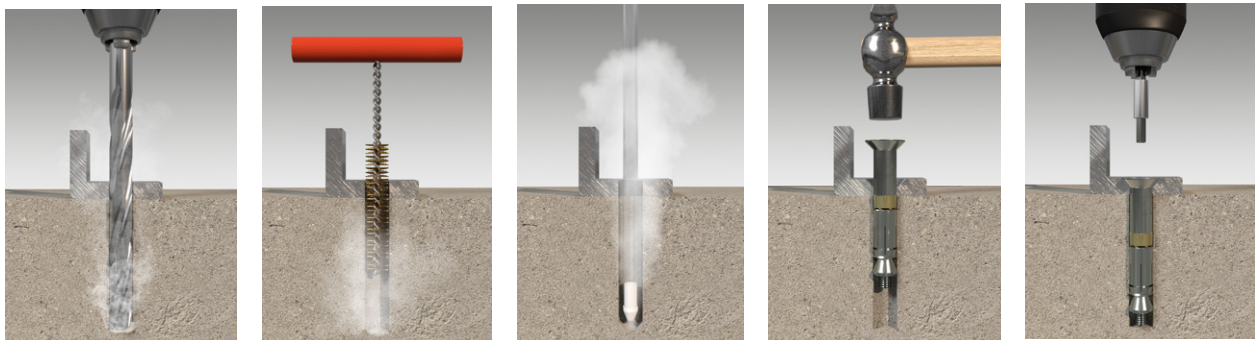
## BLS, BLS-A4, SD, SLS-A4



## BLS-P



## SKLS-A4



- 1** - Standard SDS drill procedure.
- 2** - Best practice dust removal - brush / pump.
- 3** - Repeat brush / pump procedure.
- 4** - Insert anchor.
- 5** - Apply specified torque. 2 x audible clicks will be heard from the torque wrench.



### Watch our YouTube installation guides

Visit our YouTube channel to watch our clear and concise guides on Superplus installation. Scan the QR codes right or visit [youtube.com/@ejotcouk](https://youtube.com/@ejotcouk) and search for Superplus BLS.



PRODUCT  
ANIMATION



INSTALLATION  
VIDEO

# Installation tools and accessories



With the vast amount of research and development invested into the design and manufacture of all EJOT fastening systems, installation tools are of equal importance in achieving optimised performance and correct function of product.

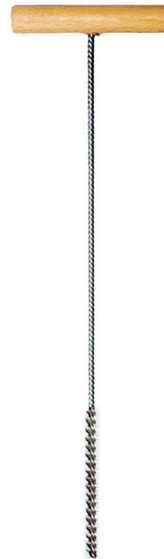
These tools and accessories have been designed specifically for use with EJOT anchoring products to deliver correct installation features and to maximise efficiency for the installer.



SDS drill bits



Vortex-SDS dust reduction



Metal brushes



EJOT blow-out pump

For more information on the EJOT tools and accessories range, visit EJOT online or talk to your EJOT sales engineer

**VISIT** the webshop at [ejot.co.uk](http://ejot.co.uk)

**CALL** customer service on 01977 687 040

**TALK** to your EJOT sales engineer

Scan the QR code to find your regional contacts





# Notes



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Bringing it together.