

CHEMICAL ANCHOR PLUS

Polyester anchoring system for secure fixing into non-cracked concrete.

Function: After drilling and cleaning the hole, the capsule is inserted into the hole and the anchor stud is driven with a rotating/hammering action. This breaks the capsule and mixes the contents. The resulting chemical reaction creates a durable expansion pressure free bond between the anchor stud, the reacted resin, and the concrete.

Benefits:

- Expansion pressure free
- Reduced permissible edge distances and spacings
- Completely seals drilled hole



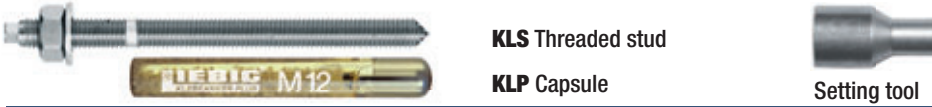
SIMPSON
Strong-Tie

IEBIG



CHEMICAL ANCHOR PLUS

CONSTRUCTION:



KLS Threaded stud

KLP Capsule

Setting tool

MATERIAL:

- KLS: Carbon steel, zinc plated and blue passivated
- KLS A4: A4-70 stainless steel
- KLP: Glass capsule with polyester resin, hardener and mineral aggregates

BASE MATERIAL:

Non-cracked concrete C20/25 to C50/60 (B25 to B55)

APPROVAL:

Deutsches Institut für Bautechnik (DIBt) Z-21-1772

LOAD RANGE:

Tension: $N_{perm} = 4.0 - 60.0$ [kN]
 Shear: $V_{perm} = 4.0 - 60.0$ [kN]

TEMPERATURE RANGE:

Maximum long-term service temperature = +50°C; Maximum short-term service temperature = +80 °C

RANGE SUPPLIED:

KLS: M8 – M30, carbon steel, zinc plated and blue passivated / A4 stainless steel

APPLICATIONS:

- Brackets
- Base plates
- Railings
- Steel construction
- Storage racks
- Machines

BENEFITS:

- Causes no expansion pressure
- Reduced edge distances and spacings
- High capacity in non-cracked concrete
- Stud with hex head for easy installation with setting tool
- Completely seals drilled hole

PRODUCT DESCRIPTION:

- The Chemical Anchor Plus adhesive fixing system consists of a threaded stud and chemical-filled glass capsule.
- During installation, the capsule is crushed and the rotating and hammering action mixes the contents. After the recommended cure time, the fixture can be installed and the fixing can be loaded.
- Capsule have shelf life of 2 years when stored correctly. Don't use if capsule is damaged or if the contents do not flow in a honey-like fashion of room temperature.
- The bond strength between the cured chemical and the drilled hole is dependent on the thorough cleaning of the drilled hole. Follow the installation instructions carefully.

STORAGE OF KLP:

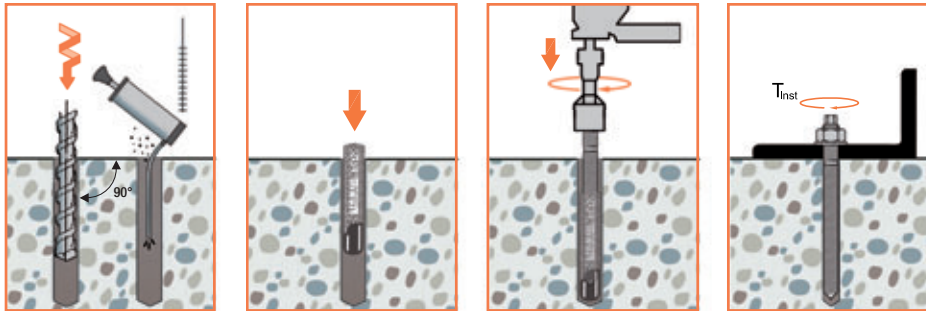
Dry, dark, at a temperature between +5°C and +25°C. Avoid direct sunlight.

SHELF LIFE:

2 years after manufacturing date when stored according to the above recommendations.

INSTALLATION:

Pre-fix installation shown



Drill hole and thoroughly clean (brushing and blowing)

Insert KLP capsule into drilled hole

Spin in KLS stud to the embedment depth marking using a rotary hammer drill

After the specified cure time, install the fixture and apply the recommended fastening torque with a calibrated torque-wrench



Photo: Lördige



CHEMICAL ANCHOR PLUS

Carbon steel, zinc plated / A4 stainless steel

KLS, CARBON STEEL, ZINC PLATED

Threaded stud with hex head, hex nut and washer
Material: Grade 5.8 steel, zinc plated and blue passivated
Approval: Z-21.3-1772



Type	Order Code	Thread Size	Ø x Depth of Drilled Hole	Max. Fixture Thickness	Ø Fixture Hole	Eff. Embedment Depth	Total Length	Weight	Box Quantity*	Compatible Capsule
			d _o x h ₁	t _{fix}	d _f	h _{ef}	L			
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg/100 pcs]	[pcs]	[Type]
KLS 8/110	KLS0810080016	M8	10 x 80	16	9	80	110	4.0	10	KLP 8
KLS 10/130	KLS1012090022	M10	12 x 90	22	12	90	130	9.0	10	KLP 10
KLS 10/165	KLS1012090057	M10	12 x 90	57	12	90	165	10.6	10	KLP 10
KLS 10/190	KLS1012090082	M10	12 x 90	82	12	90	190	11.7	10	KLP 10
KLS 12/160	KLS1214110030	M12	14 x 110	30	14	110	160	14.5	10	KLP 12
KLS 12/220	KLS1214110090	M12	14 x 110	90	14	110	220	18.6	10	KLP 12
KLS 12/250	KLS1214110120	M12	14 x 110	120	14	110	250	20.7	10	KLP 12
KLS 12/300	KLS1214110170	M12	14 x 110	170	14	110	300	24.1	10	KLP 12
KLS 16/165	KLS1618125013	M16	18 x 125	13	18	125	165	26.0	10	KLP 16
KLS 16/190	KLS1618125038	M16	18 x 125	38	18	125	190	29.0	10	KLP 16
KLS 16/250	KLS1618125098	M16	18 x 125	98	18	125	250	36.3	10	KLP 16
KLS 16/300	KLS1618125148	M16	18 x 125	148	18	125	300	42.3	10	KLP 16
KLS 20/220	KLS2025170020	M20	25 x 170	20	22	170	220	50.1	6	KLP 20
KLS 20/260	KLS2025170060	M20	25 x 170	60	22	170	260	58.0	6	KLP 20
KLS 24/300	KLS2428210055	M24	28 x 210	55	26	210	300	98.5	6	KLP 24
KLS 30/380	KLS3035280055	M30	35 x 280	55	33	280	380	196.0	4	KLP 30

*Each box of KLS contains one setting tool.

Custom lengths available on request.

KLS, A4 STAINLESS STEEL

Threaded stud with hex head, hex nut and washer
Material: A4-70 stainless steel
Approval: Z-21.3-1772



Type	Order Code	Thread Size	Ø x Depth of Drilled Hole	Max. Fixture Thickness	Ø Fixture Hole	Eff. Embedment Depth	Total Length	Weight	Box Quantity*	Compatible Capsule
			d _o x h ₁	t _{fix}	d _f	h _{ef}	L			
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg/100 pcs]	[pcs]	[Type]
KLS 8/110A4	KLS0810080016A4	M8	10 x 80	16	9	80	110	4.0	10	KLP 8
KLS 10/130A4	KLS1012090022A4	M10	12 x 90	22	12	90	130	9.0	10	KLP 10
KLS 10/165A4	KLS1012090057A4	M10	12 x 90	57	12	90	165	10.6	10	KLP 10
KLS 10/190A4	KLS1012090082A4	M10	12 x 90	82	12	90	190	11.7	10	KLP 10
KLS 12/160A4	KLS1214110030A4	M12	14 x 110	30	14	110	160	14.5	10	KLP 12
KLS 12/220A4	KLS1214110090A4	M12	14 x 110	90	14	110	220	18.6	10	KLP 12
KLS 12/250A4	KLS1214110120A4	M12	14 x 110	120	14	110	250	20.7	10	KLP 12
KLS 12/300A4	KLS1214110170A4	M12	14 x 110	170	14	110	300	24.1	10	KLP 12
KLS 16/165A4	KLS1618125013A4	M16	18 x 125	13	18	125	165	26.0	10	KLP 16
KLS 16/190A4	KLS1618125038A4	M16	18 x 125	38	18	125	190	29.0	10	KLP 16
KLS 16/250A4	KLS1618125098A4	M16	18 x 125	98	18	125	250	36.3	10	KLP 16
KLS 16/300A4	KLS1618125148A4	M16	18 x 125	148	18	125	300	42.3	10	KLP 16
KLS 20/220A4	KLS2025170020A4	M20	25 x 170	20	22	170	220	50.1	6	KLP 20
KLS 20/260A4	KLS2025170060A4	M20	25 x 170	60	22	170	260	58.0	6	KLP 20
KLS 24/300A4	KLS2428210055A4	M24	28 x 210	55	26	210	300	98.5	6	KLP 24
KLS 30/380A4	KLS3035280055A4	M30	35 x 280	55	33	280	380	196.0	4	KLP 30

*Each box of KLS contains one setting tool.

Custom lengths available on request.

KLP CAPSULE

Glass capsule
Approval: Z-21.3-1772



Type	Order Code	Diameter	Length	Weight	Box Quantity
		Ø	L		
		[mm]	[mm]	[kg/100 pcs]	[pcs]
KLP 8	KLP08	9	80	2.0	10
KLP 10	KLP10	11	80	2.0	10
KLP 12	KLP12	13	95	2.5	10
KLP 16	KLP16	17	95	4.0	10
KLP 20	KLP20	22	170	11.0	6
KLP 24	KLP24	24	210	13.0	6
KLP 30	KLP30	33	265	36.5	2

Carbon steel, zinc plated / A4 stainless steel

Permissible loads for single anchors without influence from edge and spacing distances.
Calculations shall follow the requirements of approval Z-21.3-1772.

Material: Carbon steel, zinc plated and blue passivated; A4 stainless steel

Thread size		M8	M10	M12	M16	M20	M24	M30
Effective embedment depth	[mm]	80	90	110	125	170	210	280
Type KLS...		8/...	10/...	12/...	16/...	20/...	24/...	30/...

Permissible loads at any angle¹⁾

F _{perm}	Non-cracked concrete ²⁾ C20/25 - C50/60	[kN]	Steel		A4		Steel		A4		Steel		A4		Steel		A4	
			Steel	A4	Steel	A4	Steel	A4	Steel	A4	Steel	A4						
			4.0	4.0	7.0	7.0	10.0	10.0	15.0	15.0	27.0	27.0	37.0	37.0	60.0	60.0		

Permissible bending moments

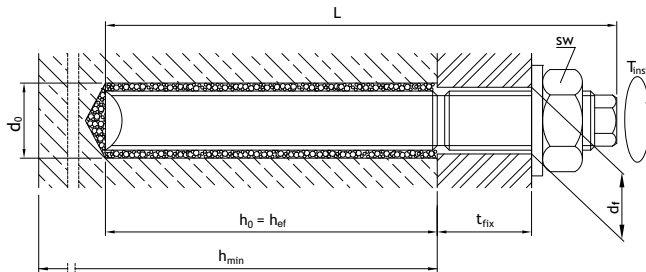
M _{perm}	[Nm]	10.7	12.1	21.4	24.1	37.4	42.7	94.9	107.0	186.0	209.0	321.0	360.8	642.0	723.2

Spacings, edge distances and member thicknesses

Effective embedment depth	h _{ef}	[mm]	80	80	90	90	110	110	125	125	170	170	210	210	280	280
Characteristic spacing ³⁾	a	[mm]	200	200	220	220	270	270	310	310	420	420	520	520	700	700
Minimum spacing	a _{min}	[mm]	80	80	90	90	110	110	125	125	170	170	210	210	280	280
Characteristic edge distance ³⁾	a _r	[mm]	100	100	110	110	135	135	155	155	210	210	260	260	350	350
Minimum edge distance	a _{r,min}	[mm]	40	40	45	45	55	55	65	65	85	85	105	105	140	140
Minimum member width	b _{min}	[mm]	80	80	90	90	110	110	125	125	170	170	210	210	280	280
Minimum member thickness	h _{min}	[mm]	130	130	140	140	160	160	175	175	220	220	260	260	330	330

Installation data

Drill hole diameter	d ₀	[mm]	10	12	14	18	25	28	35
Drill hole depth	h ₁	[mm]	80	90	110	125	170	210	280
Clearance hole in the fixture	d _f	[mm]	9	12	14	18	22	26	33
Width across flats hex nut	sw	[mm]	13	17	19	24	30	36	46
Installation torque	T _{inst}	[Nm]	10	20	40	80	150	200	400

Installed anchor**Curing schedule**

Drill hole temperature	Curing time
[°C]	[min]
> 20	10
10 - 20	20
0 - 10	60

1) Permitted loads per anchor in non-cracked concrete of strength C20/25 to C50/60 (B25 to B55) for axial tension, shear, and oblique loads.

2) Concrete is considered non-cracked when the tensile stress within the concrete $\sigma_t + \sigma_r \leq 0$. In the absence of a detailed analysis $\sigma_r = 3 \text{ N/mm}^2$ can be assumed (σ_t equals the tensile stress within the concrete resulting from external loads, including forces on the anchor).

3) If spacings or edge distances are smaller than the characteristic values, the permissible loads shall be reduced based on the Kappa method (see Z-21.3-1772, Annexes 4 + 5).

Complete your designs more easily by downloading our LIEBIG anchor software from our home-page: www.simpson-liebig.com