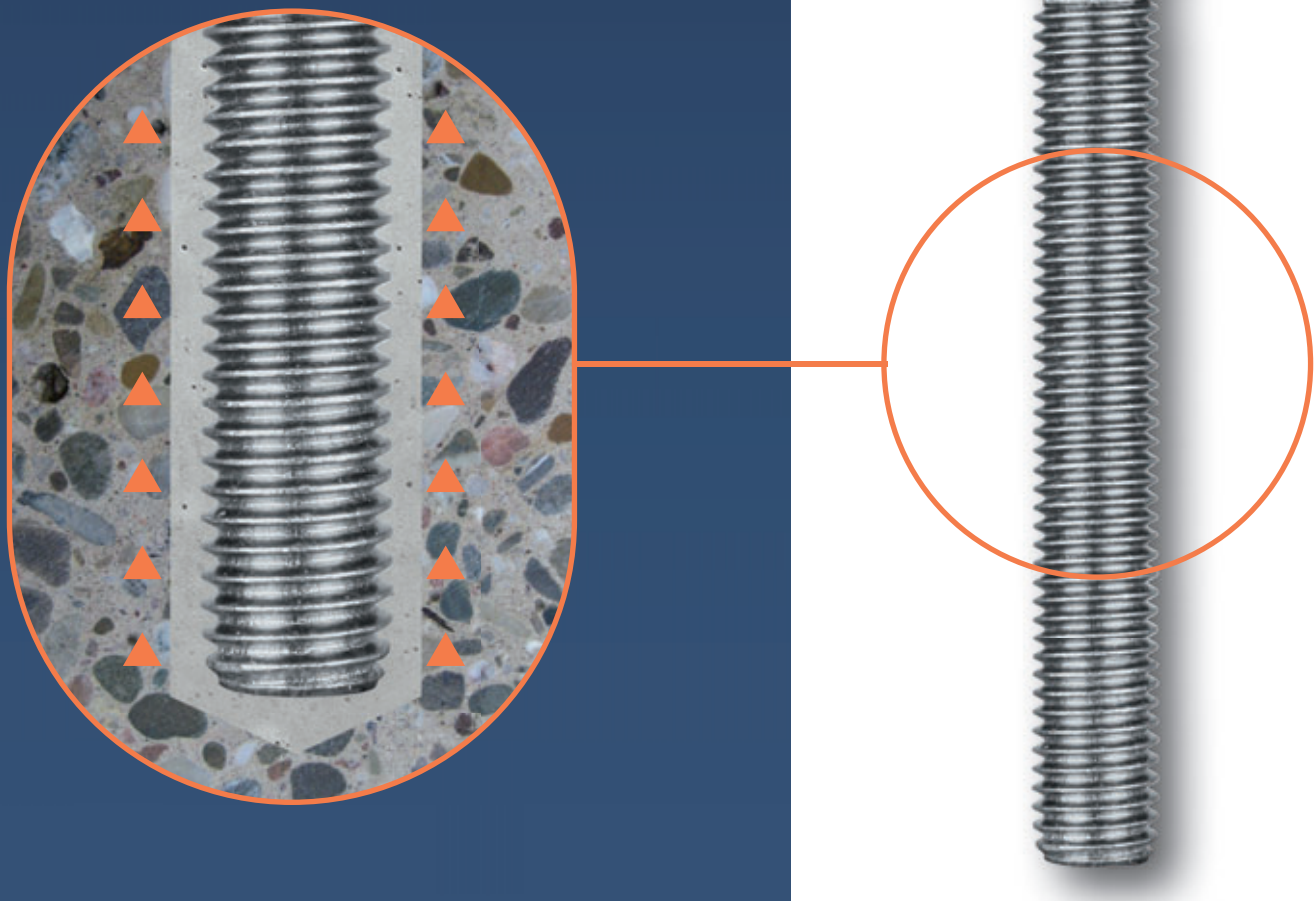
INJECTION 2000 CHEMICAL ANCHOR SYSTEM

Polyester injection mortar for fixings in masonry and non-cracked concrete.

Function: After drilling and cleaning the hole, the adhesive mortar is injected with an applicator gun. A static mixing nozzle assures that the chemical components are properly mixed. Immediately afterwards a threaded stud is inserted into the resin with a twisting action to ensure even distribution of resin over the stud length and to displace any entrapped air. For fixing into hollow masonry, a plastic or metal sieve is used in order to prevent excessive flow of the adhesive into the masonry voids. After the adhesive mortar has cured, the anchor can be fully loaded. The completed chemical reaction creates a durable expansion pressure free bond and/or mechanical interlock between the anchor stud, the reacted resin, and the base material.

Benefits:

- Fixing produces no expansion pressure
- Reduced edge distances and spacings
- Completely seals drilled hole
- Fast-curing



INJECTION 2000

CONSTRUCTION:

Threaded Stud LMAS
with hex nut and washer

INJECTION 2000
410 ml cartridge

Applicator Gun
(see pg. 58)

MATERIAL:

- Injection 2000: Polyester resin, hardener and mineral aggregates
- LMAS: Grade 5.8 carbon steel, zinc plated and blue passivated
- LMAS: A4-70 stainless steel

BASE MATERIAL:

- Non-cracked concrete C20/25 to C50/60
- Solid and hollow masonry
- Also suitable for other base materials (on-site testing recommended)

LOAD RANGE:

Tension: N_{perm} = 4.9 - 27.4 [kN]
Shear: V_{perm} = 5.1 - 56.8 [kN]

STORAGE OF INJECTION 2000 CARTRIDGES:

Dry, out of direct sunlight, at a temperature between +5 °C and +25 °C

TEMPERATURE RANGE:

Maximum long-term service temperature = +40 °C; Maximum short-term service temperature = +60 °C

PRODUCT RANGE:

- INJECTION 2000 cartridge: 410 ml
- LMAS threaded studs: M8 to M24, carbon steel, zinc plated and blue passivated / A4 stainless steel

APPLICATIONS:

- Steel and metal construction
- Racking systems
- Machines
- Railings
- Awnings
- Sanitary fixings

BENEFITS:

- Causes no expansion pressure
- Reduced edge distances and spacings
- Completely seals drilled hole
- No special setting tool required for threaded stud

PRODUCT DESCRIPTION:

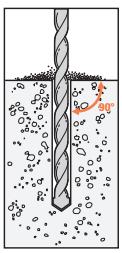
- The INJECTION 2000 Chemical Anchor system consists of a threaded stud and a 2-component chemical-filled cartridge system.
- The mortar is injected into the drilled hole with an applicator gun. In the case of hollow masonry, a plastic or metal sieve is used in order to prevent excessive flow of the adhesive into the masonry voids. A static mixing nozzle is used to ensure that the chemical components are properly mixed. A chemical reaction ensues and the mortar cures over a time period depending on the base material temperature.
- Immediately after injection, a threaded stud is inserted into the hole (or sieve).
- After the adhesive mortar has cured, the anchor can be fully loaded. The completed chemical reaction creates a durable expansion pressure free bond and/or mechanical interlock between the anchor stud, the reacted resin, and the base material.
- 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.

SHELF LIFE:

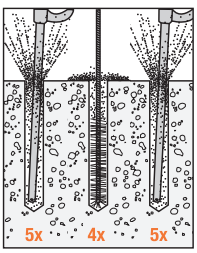
12 months after manufacture when stored according to the above recommendations. The manufacturing date is printed on the cartridge.

INSTALLATION:

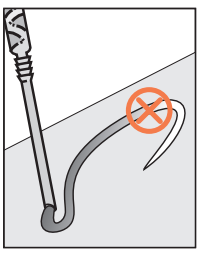
Pre-fix installation shown



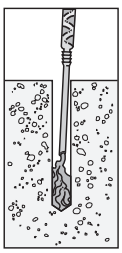
Drill hole



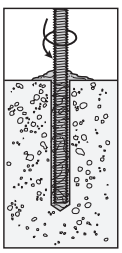
Clean out hole using a wire brush and blow out pump (blow out 5x, brush 4x and blow out 5x)



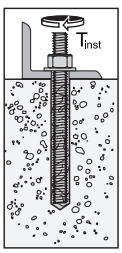
Dispense mortar to side until properly mixed (uniform colour)



Inject mortar into the hole



Insert threaded stud with a twisting action and observe the specified cure time



Attach fixture and apply the recommended fastening torque with a calibrated torque wrench

Carbon steel, zinc plated

LMAS

Threaded stud with hex nut and washer
Material: Grade 5.8, carbon steel, zinc plated and blue passivated

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
			d_0 x h_1	t_{fix}	d_f	h_{ef}	L		
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg/100 pcs]	[pcs]
LMAS M8 x 110	LMAS0810080020	M8	10 x 80	20	9	80	110	4.0	20
LMAS M10 x 130	LMAS1012090025	M10	12 x 90	25	12	90	130	9.0	10
LMAS M10 x 165	LMAS1012090060	M10	12 x 90	60	12	90	165	10.6	10
LMAS M12 x 150	LMAS1214100035	M12	14 x 100	35	14	100	150	13.6	10
LMAS M12 x 185	LMAS1214100070	M12	14 x 100	70	14	100	185	16.8	10
LMAS M16 x 170	LMAS1618130020	M16	18 x 130	20	18	130	170	26.8	10
LMAS M16 x 200	LMAS1618130050	M16	18 x 130	50	18	130	200	31.5	10
LMAS M20 x 245	LMAS2025170050	M20	24 x 170	50	22	170	245	55.8	6
LMAS M24 x 310	LMAS2428210070	M24	28 x 210	70	26	210	310	101.8	6

Custom lengths and grades available on request.

A4 stainless steel

LMAS A4

Threaded stud with hex nut and washer
Material: A4-70 stainless steel

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
			d_0 x h_1	t_{fix}	d_f	h_{ef}	L		
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg/100 pcs]	[pcs]
LMAS M8 x 110 A4	LMAS0810080020A4	M8	10 x 80	20	9	80	110	4.0	20
LMAS M10 x 130 A4	LMAS1012090025A4	M10	12 x 90	25	12	90	130	9.0	10
LMAS M10 x 165 A4	LMAS1012090060A4	M10	12 x 90	60	12	90	165	10.6	10
LMAS M12 x 150 A4	LMAS1214100035A4	M12	14 x 100	35	14	100	150	13.6	10
LMAS M12 x 185 A4	LMAS1214100070A4	M12	14 x 100	70	14	100	185	16.8	10
LMAS M16 x 170 A4	LMAS1618130020A4	M16	18 x 130	20	18	130	170	26.8	10
LMAS M16 x 200 A4	LMAS1618130050A4	M16	18 x 130	50	18	130	200	31.5	10
LMAS M20 x 245 A4	LMAS2025170050A4	M20	24 x 170	50	22	170	245	55.8	6
LMAS M24 x 310 A4	LMAS2428210070A4	M24	28 x 210	70	26	210	310	101.8	6

Custom lengths and grades available on request.

Injection 2000-Cartridge

Contains a polyester resin, hardener and mineral aggregates

410 ml Cartridge

Type	Order Code	Content	Weight	Box Quantity*
		[ml]	[kg/12 pcs]	[pcs]
Injection 2000	INJECTION2000	410	10.8	12

* Each cartridge includes 1 mixing nozzle.

Mixing Nozzle

Type	Order Code	Weight
		[kg/100 pcs]
Mixing Nozzle	MD	1

Carbon steel, zinc plated / A4 stainless steel

Recommended loads for single anchors with no influencing edge distances or spacings.

Material: Carbon steel, Grade 5.8, zinc plated and blue passivated; A4-70 stainless steel / Injection 2000 (polyester resin)

Thread size			M8		M10		M12		M16		M20		M24	
Effective embedment depth (h_{ef})		[mm]	80		90		100		130		170		210	
Type LMAS…			M8 x ...		M10 x ...		M12 x ...		M16 x ...		M20 x ...		M24 x ...	
Recommended tension loads[1]			Steel	A4	Steel	A4	Steel	A4	Steel	A4	Steel	A4	Steel	A4
N_{perm}	Non-cracked concrete[2] C20/25 - C50/60	[kN]	4.9	4.9	7.5	7.5	10.6	10.6	12.3	12.3	19.9	19.9	27.4	27.4
Recommended shear loads[1]														
V_{perm}	Non-cracked concrete[2] C20/25 - C50/60	[kN]	5.1	5.6	8.6	9.2	12.6	13.3	23.4	25.2	36.6	39.4	52.6	56.8
Recommended bending moments														
M_{perm}		[Nm]	10.9	11.9	22.3	23.8	38.9	42.1	98.9	106.7	192.6	207.9	333.7	359.9

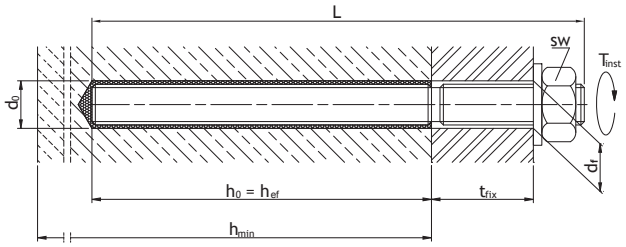
Spacings, edge distances and member thicknesses

Effective embedment depth	h_{ef}	[mm]	80	90	100	130	170	210
Characteristic spacing	$s^{3)}$	[mm]	100	130	150	170	210	240
Minimum spacing	s_{min}	[mm]	50	70	90	100	130	150
Characteristic edge distance for tension load	$c_N^{3)}$	[mm]	80	90	100	130	150	190
Minimum edge distance for tension load	$c_{min,N}$	[mm]	50	60	80	90	100	125
Characteristic edge distance for shear load	$c_V^{3)}$	[mm]	100	130	150	170	190	240
Minimum edge distance for shear load	$c_{min,V}$	[mm]	60	75	90	100	130	150
Minimum member thickness	h_{min}	[mm]	160	180	200	260	340	420

Installation data

Drill hole diameter	d_0	[mm]	10	12	14	18	24	28
Drill hole depth	h_1	[mm]	80	90	100	130	170	210
Clearance hole in the fixture	d_f	[mm]	9	12	14	18	22	26
Width across flats hex nut	sw	[mm]	13	17	19	24	30	36
Installation torque for concrete	T_{inst}	[Nm]	10	20	35	75	120	200
Installation torque for brick	T_{inst}	[Nm]	3	13	24	43	-	-

Installed anchor



Typical performance in masonry

Type	Recommended load in all directions	
	Brickwork (20.5 N/mm²)	Blockwork (7 N/mm²)
	[kN]	[kN]
LMAS M8	1.7	0.8
LMAS M10	3.4	1.7
LMAS M12	4.8	2.7
LMAS M16	5.6	3.6

Curing schedule*

Temperature [°C]	0	5	15	25	35
Gel time [min]	50	12	6	3	2
Curing time [min]	90	50	35	30	25

* Figures based on M12 fixings. Full cure is achieved after 24 hours!

1) Permissible loads in non-cracked concrete C20/25 - C50/60.
2) 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).
3) If spacings or edge distances are smaller than the characteristic values, the permissible loads shall be reduced based on the Kappa method.