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RebarCap

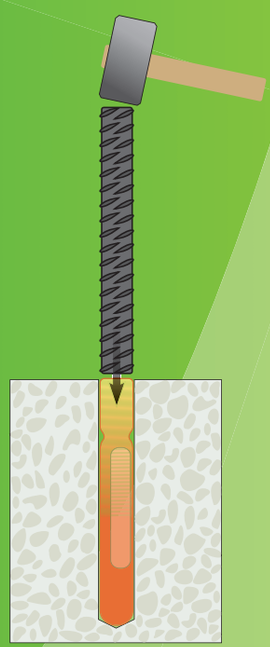
Hammer-In Capsule

Product Data Sheet

STAHLFIX

PROFESSIONAL CHEMICAL ANCHOR

Hammer Capsule Data for Studs & Rebars.



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RebarCap

Hammer-In Capsule

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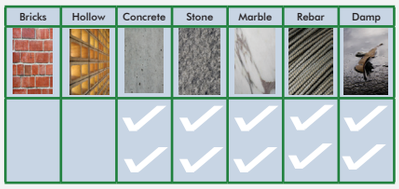
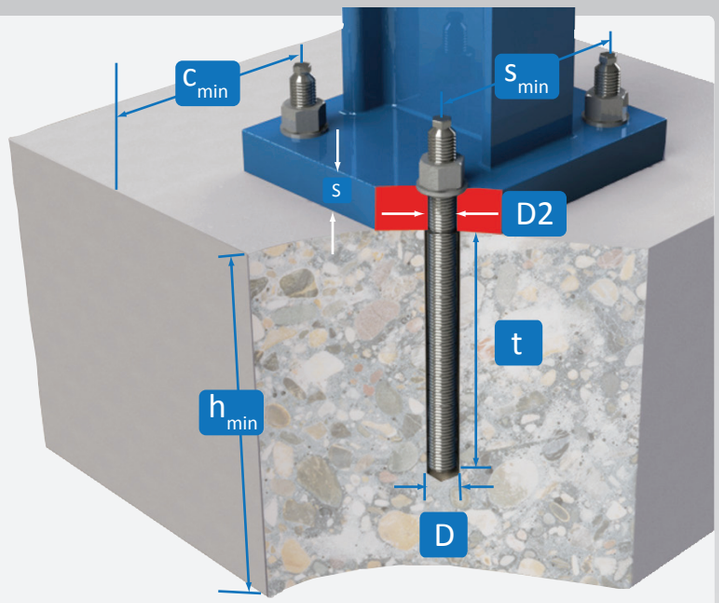


DIBt

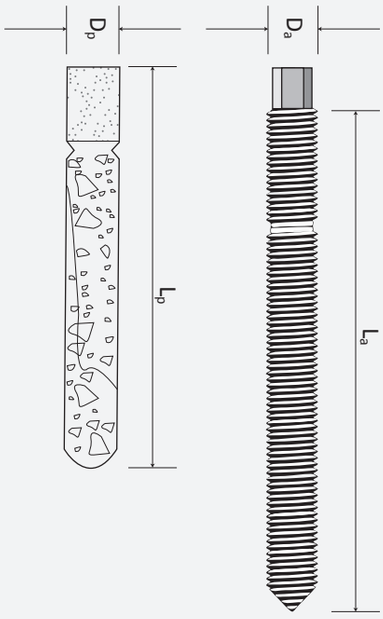
DIBt Approval



Specification Data for HammerCap Anchors using Threaded Rods.

APPLICATION RANGE

- pressure free fixing
- low edge distances
- safe long-term behaviour
- favourable performance in case of combustion
- safe mixing of component A and B
- low shrinkage
- suitable for heavy loads
- appropriate for concrete and natural stone
- excellent durability
- polyester



Product Dimensions

Da (mm)	L_a (mm) (t1)	L_a (mm) (t1)	D_p (mm)	L_p (mm)	V_p cc
M8	110	190	9	80	4.0
M10	140	240	11	90	6.4
M12	170	290	13	110	11.3
M16	225	385	17	125	23.1
M20	290	490	22	175	53.0
M24	330	570	24	210	76.0
M30	400	700	33	265	191.0

Installation Dimensions

Da (mm)	D (mm)	t1 (mm)	t2 (mm)	D2 (mm)	S (mm)	No. Capsules (t1)	No. Capsules (t2)	Nm
M8	10	80	160	12	18	1	2	6
M10	12	100	200	14	25	1	2	12
M12	14	120	240	16	34	1	2	20
M16	18	160	320	20	45	1	2	45
M20	25	200	400	25	55	1	2	100
M24	28	240	480	28	55	1	2	150
M30	35	300	600	35	55	1	2	300

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RebarCap

Hammer-In Capsule

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Ultimate Tensile Loads For HammerCap Anchors (Concrete >B25) (kN) (U_{tL})

Size	M8	M10	M12	M16	M20	M24	M30
5.8	18	27	38	66	114	154	240
8.8	18	27	38	66	114	154	240
V4A	18	27	38	66	114	154	240

Ultimate Shear Loads For HammerCap Anchors (Concrete >B25) (kN) (U_{sL})

Size	M8	M10	M12	M16	M20	M24	M30
5.8	11	17	25	47	73	105	168
8.8	17	27	40	75	118	170	268
V4A	15	24	35	65	102	105	168

Recommended Safety Factors

- Heavy reinforced concrete for static loads in the compressive zone - 2.5 - 3
- Concrete subject to vibratory loads - 3.5 - 4
- Polluted areas - 3.5 - 4
- The tensile zone of the concrete - 3.5 - 4
- Severe weather conditions: cold-wet-warm-cold - 4 - 5
- Underwater installation - 4 - 5
- Earthquake areas - 5 - 6

Recommended Center to Center Distances (Concrete >B25)

Size	M8	M10	M12	M16	M20	M24	M30
mm	200	220	270	310	420	520	700

Recommended Center to Edge Distances (Concrete >B25)

Size	M8	M10	M12	M16	M20	M24	M30
mm	100	110	135	155	210	260	350

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Design Performance Data (Studs)

Grade 5.8 Studs x 1 Capsule (C20/25 Concrete)									
Bar Diameter mm	Characteristic Resistance kN		Design Resistance kN		Recommended Load kN		Spacing mm	Edge Distance mm	
	Tensile	Shear	Tensile	Shear	Tensile	Shear	Tensile & Shear	Tensile	Shear
8	18.5	9.0	9.8	7.2	7.0	5.1	160	80	90
10	28.5	14.0	11.3	11.2	8.1	8.0	180	90	125
12	47.5	21.0	18.8	16.8	13.4	12.0	240	120	160
16	84.4	39.0	33.5	31.2	23.9	22.3	320	160	270
20	131.8	61.0	52.3	48.8	37.4	34.9	400	200	300
24	155.1	88.0	61.6	70.4	44.0	50.3	420	210	360
30	258.6	140.2	102.6	112.2	73.3	51.3	560	260	420

Grade 5.8 Studs x 2 Capsule (C20/25 Concrete)									
Bar Diameter mm	Characteristic Resistance kN		Design Resistance kN		Recommended Load kN		Spacing mm	Edge Distance mm	
	Tensile	Shear	Tensile	Shear	Tensile	Shear	Tensile & Shear	Tensile	Shear
8	18.5	9.0	12.2	7.2	8.7	5.1	40	50	90
10	29.0	14.0	19.3	11.2	13.8	8.0	260	150	125
12	56.5	21.0	37.7	16.8	26.9	12.0	480	240	160
16	100.0	39.0	66.6	31.2	47.6	22.3	660	330	270
20	157.0	61.0	104.7	48.8	74.8	34.9	800	400	300
24	176.5	88.0	117.7	70.4	84.1	50.3	810	405	360
30	280.5	140.2	187.0	112.2	133.6	51.3	930	500	420

Shear Loads towards a free edge are for single anchors where Spacing ≥ 3 x Edge Distance

Influence of Concrete Strength

Concrete Strength		C20/25	C25/30	C30/37	C40/50	C45/55	C50/60
Cylinder	N/mm²	20	25	30	40	45	50
Cube	N/mm²	25	30	37	50	55	60
Factor		1.00	1.10	1.22	1.41	1.48	1.55

When using concrete factors check all other information to ensure Steel Strength and Pull out Resistance is not exceeded

Steel Design Resistance for single anchor

		M8	M10	M12	M16	M20	M24	M30	
Tension	kN	12.0	19.3	28.0	52.0	82.0	118.0	187.0	Grade 5.8
	kN	13.3	21.0	41.0	72.6	114.0	128.0	203.8	Rebar Fe500
Shear	kN	7.1	11.2	16.8	31.2	48.8	70.4	112.2	Grade 5.8
	kN	6.6	10.5	20.5	36.3	57.0	64.1	101.9	Rebar Fe500

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RebarCap
Hammer-In Capsule

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Installation Procedure for Hammer Capsules with Threaded Rods

- Drill hole either with an electric rotary hammer or a diamond drilling machine.
- In reinforced concrete the use of a diamond drilling machine is recommended.
- Clean anchor hole thoroughly by using a brush and compressed air or water.
- Before inserting the hammer capsule into the hole, check the viscosity of the resin. At lukewarm temperature, it should run easily inside the capsule.
- Always take care to note the arrow direction on the capsule before inserting into the hole. To ensure that the capsule is inserted correctly, always have the arrow pointing towards the hole as you insert the capsule.
- Clean anchor rod before inserting into the hole. Anchor rod should be free of any grease, corrosion or oils.
- Mark the anchor rod with the correct embedment depth. Installation of the rod may be executed manually, using a handheld hammer or mechanically using an electric or pneumatic percussion tool providing sufficient power to mix the components completely. (!! Always wear safety goggles when installing anchors).
- Observe curing times. The installed anchor may not be disturbed or loaded before the specified curing time.

Curing Times for Dry Hole Installation

Concrete Temperature °C	Curing Time
> 20	1 hrs
10 - 20	2 hrs
0 - 10	5 hrs
-5 - 0	10 hrs

Curing Times for Damp Hole Installation

Concrete Temperature °C	Curing Time
> 20	2 hrs
10 - 20	4 hrs
0 - 10	10 hrs

In-Situ Test Procedures

- We recommend to test 3% of the anchors with a minimum of 2 anchors per dimension. The proof load may be calculated as:

$$\text{Proof Load} = \frac{1.3 \times \text{Ultimate Load} \times \text{Reduction Factor}}{\text{Safety Factor}}$$

- Slippage should not exceed 0.2mm. If one anchor fails to meet the proof specifications, check 25% of all the anchors in that area.

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RebarCap

Hammer-In Capsule

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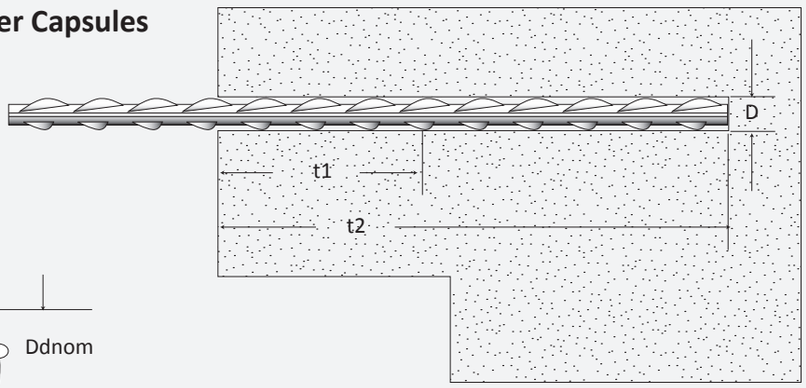
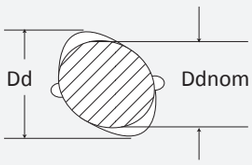
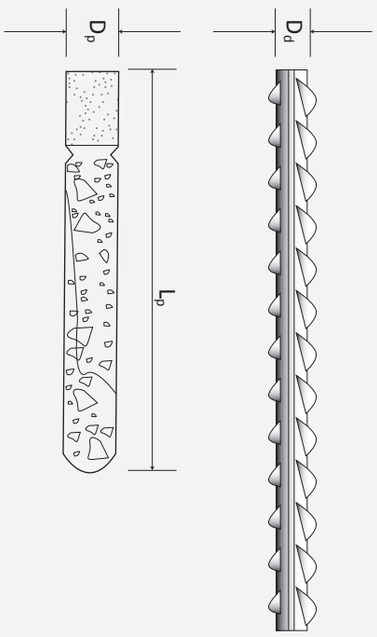
Specification Data for Hammer Capsules Anchors using Rebar.







Product Dimensions

Ddnom (mm)	Dd (mm)	Dp (mm)	Lp (mm)	Vp (cc)
8	9.5	9	80	4.0
10	11.5	11	90	6.4
12	13.9	13	110	11.3
14	16.0	17	125	23.1
16	18.7	17	125	23.1
20	23.4	22	175	53.0
25	29.2	24	210	76.0
32	37.4	33	265	191.0

Installation Dimensions

Ddnom (mm)	Dd (mm)	t1 (mm)	t2 (mm)	No. Of Capsules t1	No. Of Capsules t2
8	10	80	160	1	2
10	13	100	200	1	2
12	15	120	240	1	2
14	18	140	280	1	2
16	20	160	320	1	2
20	25	200	400	1	2
25	30	250	500	1	2
32	38	320	640	1	2

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Load Bearing Capacity

The load bearing capacity of embedded dowels depends on:

- embedment depth.
- concrete quality.
- steel quality of the dowel.
- bond strength.

It is common engineering practice to use between 15 and 20 times the nominal dowel diameter (Ddnom) as embedment depth.

Calcultation Procedure for the Ultimate Bond Strength:

For embedment deoths between 10 and 20 times the nominal dowel diameter (Ddnom), the ultimate bond strength for rebar dowel installations in concrete B25 or better with hammer capsules may be calculated using the following equation:

Bond Strength (kN) = 0.023 x drill diameter (mm) x embedment depth (mm)

Recommended Safety Factors

• Heavy reinforced concrete for static loads in the compressive zone	-	2.5 - 3
• Concrete subject to vibratory loads	-	3.5 - 4
• Polluted areas	-	3.5 - 4
• The tensile zone of the concrete	-	3.5 - 4
• Severe weather conditions: cold-wet-warm-cold	-	4 - 5
• Underwater installation	-	4 - 5
• Earthquake areas	-	5 - 6

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Design Performance Data (Rebar)

Rebar x 1 Capsule (C20/25 Concrete)									
Bar Diameter mm	Characteristic Resistance kN		Design Resistance kN		Recommended Load kN		Spacing mm	Edge Distance mm	
	Tensile	Shear	Tensile	Shear	Tensile	Shear	Tensile & Shear	Tensile	Shear
8	20.0	9.9	9.8	6.6	7.0	4.7	110	65	90
10	28.5	15.7	11.3	10.5	8.1	7.5	180	90	125
12	47.5	30.7	18.8	20.5	13.4	14.6	240	120	160
16	84.4	54.4	33.5	36.3	23.9	25.9	360	180	270
20	131.8	85.5	52.3	57.0	37.4	40.7	400	200	300
25	155.1	96.1	61.6	64.1	44.0	45.8	420	210	360
32	258.6	152.8	102.6	101.9	73.3	72.8	560	280	420

Rebar x 2 Capsule (C20/25 Concrete)									
Bar Diameter mm	Characteristic Resistance kN		Design Resistance kN		Recommended Load kN		Spacing mm	Edge Distance mm	
	Tensile	Shear	Tensile	Shear	Tensile	Shear	Tensile & Shear	Tensile	Shear
8	20.0	9.9	13.3	6.6	9.5	4.7	50	65	90
10	31.6	15.7	21.0	10.5	15.0	7.5	310	165	125
12	61.6	30.7	37.7	20.5	26.9	14.6	480	240	160
16	109.0	54.5	67.0	36.3	47.9	25.9	660	330	270
20	171.1	85.5	104.7	57.0	74.8	40.7	800	400	300
25	192.4	96.1	123.1	64.1	87.9	45.8	900	450	360
32	305.7	152.8	203.8	101.9	145.6	72.8	1150	580	420

Shear Loads towards a free edge are for single anchors where Spacing ≥ 3 x Edge Distance

Influence of Concrete Strength

Concrete Strength		C20/25	C25/30	C30/37	C40/50	C45/55	C50/60
Cylinder	N/mm²	20	25	30	40	45	50
Cube	N/mm²	25	30	37	50	55	60
Factor		1.00	1.10	1.22	1.41	1.48	1.55

When using concrete factors check all other information to ensure Steel Strength and Pull out Resistance is not exceeded

Steel Design Resistance for single anchor

		M8	M10	M12	M16	M20	M24	M30	
Tension	kN	12.0	19.3	28.0	52.0	82.0	118.0	187.0	Grade 5.8
	kN	13.3	21.0	41.0	72.6	114.0	128.0	203.8	Rebar Fe500
Shear	kN	7.1	11.2	16.8	31.2	48.8	70.4	112.2	Grade 5.8
	kN	6.6	10.5	20.5	36.3	57.0	64.1	101.9	Rebar Fe500

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RebarCap

Hammer-In Capsule

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Installation Procedure for Hammer Capsules with Rebar Doweling

- Drill hole either with an electric rotary hammer or a diamond drilling machine.
- In reinforced concrete the use of a diamond drilling machine is recommended.
- Clean anchor hole thoroughly by using a brush and compressed air or water.
- Before inserting the hammer capsule into the hole, check the viscosity of the resin. At lukewarm temperature, it should run easily inside the capsule.
- Always take care to note the arrow direction on the capsule before inserting into the hole. To ensure that the capsule is inserted correctly, always have the arrow pointing towards the hole as you insert the capsule.
- Clean the rebar dowel before inserting into the hole. The dowel should be free of any grease, corrosion or oils.
- Mark the rebar dowel with the correct embedment depth. Installation of the rod may be executed manually, using a handheld hammer or mechanically using an electric or pneumatic percussion tool providing sufficient power to mix the components completely. (!! Always wear safety goggles when installing anchors).
- Observe curing times. The installed dowel may not be disturbed or loaded before the specified curing time.

Curing Times for Dry Hole Installation

Concrete Temperature °C	Curing Time
> 20	1 hrs
10 - 20	2 hrs
0 - 10	5 hrs
-5 - 0	10 hrs

Curing Times for Damp Hole Installation

Concrete Temperature °C	Curing Time
> 20	2 hrs
10 - 20	4 hrs
0 - 10	10 hrs

In-Situ Test Procedures

- We recommend to test 3% of the anchors with a minimum of 2 anchors per dimension. The proof load may be calculated as:

$$\text{Proof Load} = \frac{1.3 \times \text{Ultimate Load} \times \text{Reduction Factor}}{\text{Safety Factor}}$$

- Slippage should not exceed 0.2mm. If one anchor fails to meet the proof specifications, check 25% of all the anchors in that area.

STORAGE / SHELF LIFE	IMPORTANT
This product should be stored between +5˚C & +25˚C. The Shelf life of the product is 24 months from the manufacture date.	The information and data given is based on our own experience, research and testing and is believed to be reliable and accurate. However, as Stahlfix cannot know the varied uses to which its products may be applied, or the methods of application used, no warranty as to the fitness or suitability of its products is given or implied. It is the users responsibility to determine suitability of use. For further information please contact our Technical Department.

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Hammer-In Capsule

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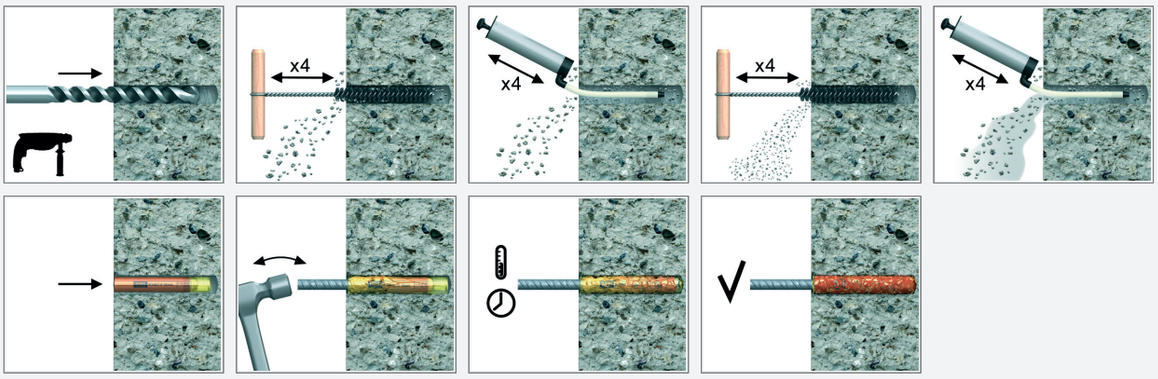
Installation Guide



Drill Hole Cleaning Accessories

Blow Out Pump	drill hole Ø	body length	box qty	weight ea.
190mm	12-35mm	190mm	24	0.15kg
280mm	12-35mm	280mm	24	0.225kg
400mm	12-35mm	400mm	24	0.5kg

Steel Brush	drill hole Ø	hole depth	box qty	weight ea.
10mm Ø handle 200mm head 80mm	8 -10mm	250mm	100	0.02kg
13mm Ø handle 200mm head 80mm	12-16mm	250mm	100	0.02kg
18mm Ø handle 200mm head 80mm	18-24mm	250mm	72	0.025kg
28mm Ø handle 200mm head 80mm	28-35mm	250mm	36	0.025kg

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Sogivaswiss SA
Lavasson 8, 1196 Gland
Tel: +4122 3645717
info@sogivaswiss.com

Sogiva Liban
Al-Fanar - Beirut
Tel: +9611873120
info@sogivaswiss.com

Sogiva Algérie
Oran
Tel: +213 775 580904
algerie@sogivaswiss.com

Sogiva Iraq
Erbil, Kurdistan
Tel: +964 7504747901
info@sogivaswiss.com

Sogiva Syrie
Damascus
Tel: + 963933507211
syria@sogivaswiss.com