



HK Ceiling anchor

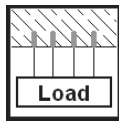
		Anchor version	Benefits
	HK	-Carbon steel -Stainless steel -High corrosion resistant steel	- well proven - small drill bit diameter - for fixing in cracked concrete, redundant fastening only, e.g. suspended ceilings
	HK I	-Carbon steel -Stainless steel -High corrosion resistant steel	



Concrete



Tensile zone ^{a)}



Redundant fastening



Fire resistance



European Technical Approval



CE conformity

a) Redundant fastening only

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European technical approval ^{a)}	DIBt	ETA-04/0043, 2010-06-30
Fire test report	DIBt	ETA-04/0043, 2010-06-30
Assessment report (fire)	warringtonfire	WF 166402 / 2007-10-26

a) All data given in this section for HK Ceiling anchor according ETA-04/0043, issue 2010-06-30. The anchor is to be used only for multiple use for non-structural applications.

Basic loading data (for a single anchor)

All data in this section applies to

- Correct setting (see setting instruction)
- No edge distance and spacing influence.
- Concrete C 20/25, $f_{ck,cube} = 25 \text{ N/mm}^2$ to C50/60, $f_{ck,cube} = 60 \text{ N/mm}^2$
- Anchors in multiple use

Characteristic resistance, all load directions

Anchor size (carbon steel)	HK6	HK6L	HK8
Resistance F_{Rk} ^{a)} [kN]	2,0	5,0	5,0
Anchor size (stainless steel, HCR)	HK6 -R /-HCR	HK6L -R /-HCR	HK8 -R /-HCR
Resistance F_{Rk} ^{a)} [kN]	1,5	3,0	5,0

a) for all load directions (tension, shear and combined tension and shear loads)

Design resistance, all load directions

Anchor size (carbon steel)	HK6	HK6L	HK8
Resistance $F_{Rd}^{a)}$ [kN]	1,1	2,0	2,0

Anchor size (stainless steel, HCR)	HK6 -R /-HCR	HK6L -R /-HCR	HK8 -R /-HCR
Resistance $F_{Rd}^{a)}$ [kN]	0,6	1,2	2,3

a) for all load directions (tension, shear and combined tension and shear loads)

Recommended loads ^{a)}, all load directions

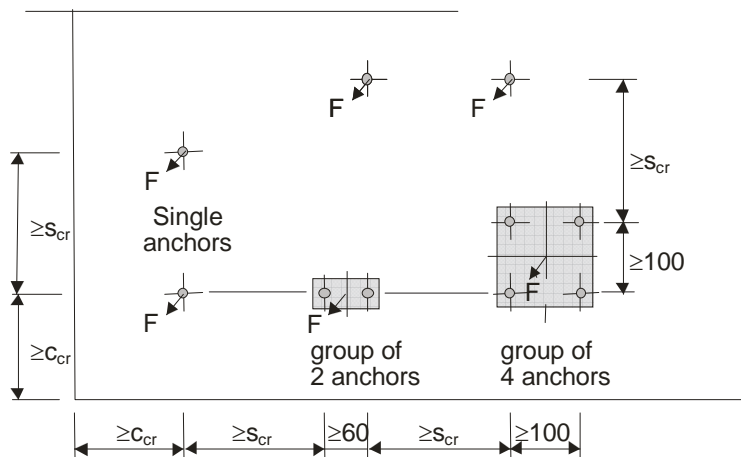
Anchor size (carbon steel)	HK6	HK6L	HK8
Resistance $F_{rec}^{b)}$ [kN]	0,8	1,4	1,4

Anchor size (stainless steel, HCR)	HK6 -R /-HCR	HK6L -R /-HCR	HK8 -R /-HCR
Resistance $F_{rec}^{b)}$ [kN]	0,4	0,8	1,6

a) With overall partial safety factor for action $\gamma = 1,4$. The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

b) for all load directions (tension, shear and combined tension and shear loads)

Special case: Groups of $n=2$ and/or $n=4$ anchors with small spacing



The basic loading data for a single anchor is valid for one fixing point.

Fixing points can be:

- **single anchors,**
- or
- **groups of 2 anchors**
with $s_1 \geq 60$ mm
- or
- **groups of 4 anchors**
with $s_1 \geq 100$ mm and $s_2 \geq 100$ mm

Requirements for multiple use

The definition of multiple use according to Member States is given in the ETAG 001 Part six, Annex 1. In Absence of a definition by a Member State the following default values may be taken

Minimum number of fixing points	Minimum number of anchors per fixing point	Maximum design load of action N_{Sd} per fixing point ^{a)}
3	1	2 kN
4	1	3 kN

a) The value for maximum design load of actions per fastening point N_{Sd} is valid in general that means all fastening points are considered in the design of the redundant structural system. The value N_{Sd} may be increased if the failure of one (= most unfavourable) fixing point is taken into account in the design (serviceability and ultimate limit state) of the structural system e.g. suspended ceiling.

Materials

Mechanical properties of HK

Anchor size (carbon steel)		HK6	HK6L	HK8
Char. bending resistance ^{a)}	$M^0_{Rk,s}$ [Nm]	3,6	7,7	18

a) Partial material safety factor $\gamma_{Ms} = 1,25$.

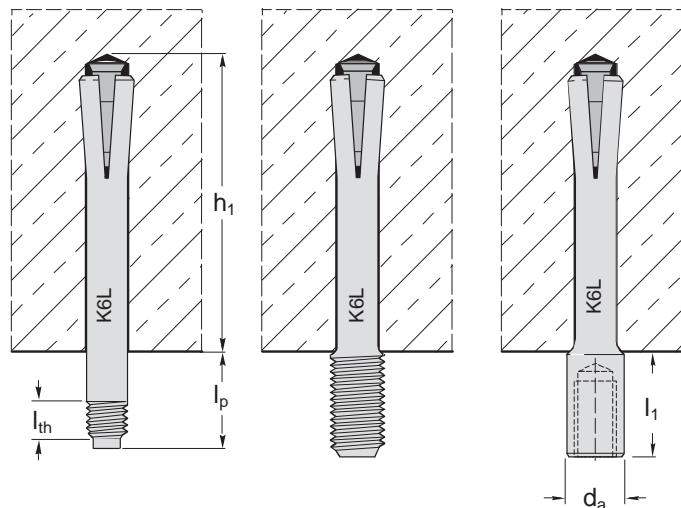
Anchor size (stainless steel, HCR)		HK6 -R /-HCR	HK6L -R /-HCR	HK8 -R /-HCR
Char. bending resistance ^{a)}	$M^0_{Rk,s}$ [Nm]	4,0	8,4	20,6

a) Partial material safety factor $\gamma_{Ms} = 1,5$.

Material quality of HK

Part	Marking	Material
Anchor HK6 Anchor HK6L Anchor HK8	K6 K6L K8	galvanised steel $\geq 5 \mu\text{m}$
Anchor HK6 -R Anchor HK6L -R Anchor HK8 -R	K6E K6LE K8E	stainless steel, 1.4401 or 1.4404
	K6X K6LX K8X	stainless steel, 1.4571
Anchor HK6 -HCR Anchor HK6L -HCR Anchor HK8 -HCR	K6C K6LC K8C	high corrosion resistant steel, 1.4529 or 1.4565

Anchor dimension



Anchor size	HK6		HK6L				
	M6/t _{fix}	M8/t _{fix}	M6/4	M6/t _{fix}	M8/t _{fix}	I M6	I M8
Thread size	external M6	external M8	external M6	external M6	external M8	internal M6	internal M8
Length of thread l _{th} [mm]	5 ... 50		≥ 5	≥ 5	≥ 5	12	12
Length of projection l _p [mm]	t _{fix} + 7		11	≤ 300	≤ 300	-	-
Diameter of sleeve d _a [mm]	-		-	-	-	8	10
Length of sleeve l ₁ [mm]	-		-	-	-	15	15

Anchor size	HK8			
	I M8	I M10	I M12	I M8/M10
Thread size	internal M8	internal M10	internal M12	internal M8/M10
Diameter of sleeve d _a [mm]	10	12	14	12
Length of sleeve l ₁ [mm]	15	20	20	25

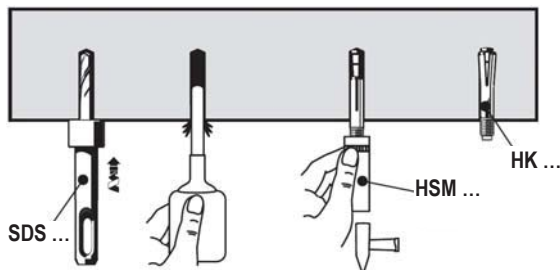
Setting

Recommended installation equipment

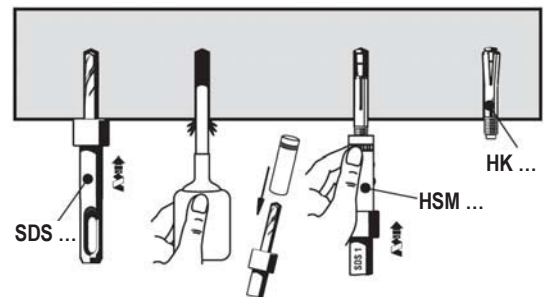
Anchor size	HK6	HKL	HK8
Rotary hammer	TE 2 – TE 16		
Stop drill bit	SDS 2		SDS 3
Setting tool	HSM ... / HSM I ...		HSM 8 ... / HSM 8 I ...
Other tools	blow out pump		

Setting instruction

Setting of HK

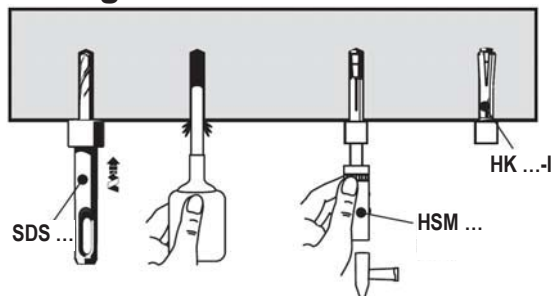


a) with hand setting tool

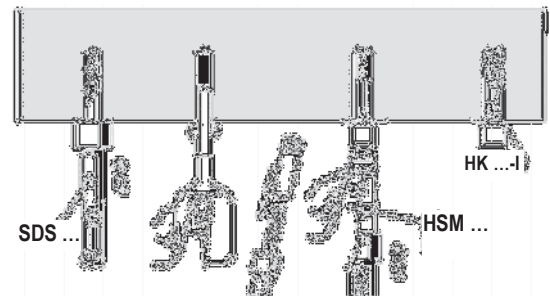


b) with machine setting tool

Setting of HK-I

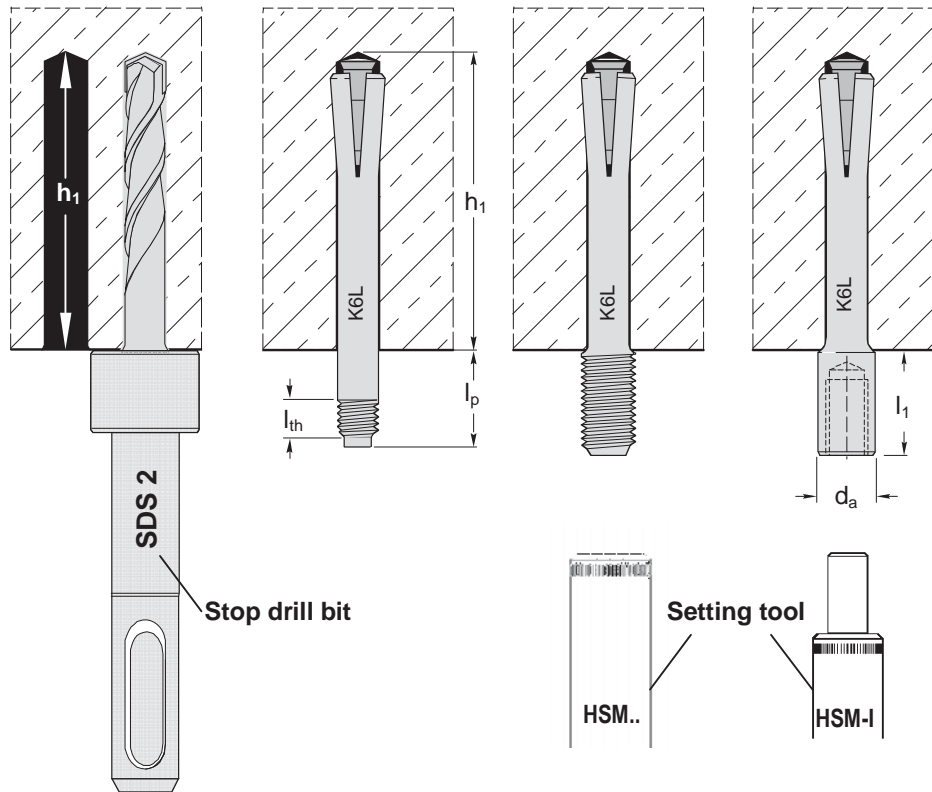


a) with hand setting tool



b) with machine setting tool

Setting details



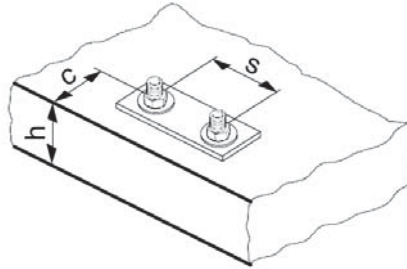
Anchor size	HK6		HK L				
	M6/t _{fix}	M8/t _{fix}	M6/4	M6/t _{fix}	M8/t _{fix}	I M6	I M8
Stop drill bit ^{a)}	SDS 1		SDS 2				
Depth of drill hole ^{b)} h ₁ [mm]	32		42				
Nominal diameter of drill bit d ₀ [mm]	6		6				
Setting tool	HSM 6 / t _{fix}	HSM 8 / t _{fix}	HSM 6 / 4	HSM 6 / t _{fix}	HSM 8 / t _{fix}	HSM I M6	HSM I M8
Clearance hole d _f ≤ [mm]	7	9	7	7	9	9	12
Max. torque moment T _{max} [Nm]	5		5				

Anchor size	HK8			
	I M8	I M10	I M12	I M8/M10
Stop drill bit ^{a)}	SDS 3			
Depth of drill hole ^{b)} h ₁ [mm]	43			
Nominal diameter of drill bit d ₀ [mm]	8			
Setting tool	HSM 8 I M8	HSM 8 I M10	HSM 8 I M12	HSM 8 I M8
Clearance hole d _f ≤ [mm]	12	14	16	14
Max. torque moment T _{max} [Nm]	10			

- a) In case of through setting choose stop drill bit with appropriate length
- b) Use stop drill bit to ensure correct depth of bore hole

Base material thickness, anchor spacing and edge distance ^{a)}

Anchor size		HK6	HKL	HK8
Minimum member thickness	$h_{min} \geq$ [mm]	80		
Effective anchorage depth	h_{ef} [mm]	26	36	36
Critical spacing	s_{cr} [mm]	200		
Critical edge distance	c_{cr} [mm]	150		



- a) The critical spacing (critical edge distance) shall be kept. Smaller spacing (edge distance) than critical spacing (critical edge distance) are not covered by the design method.