SUORITUSTASOILMOITUS

DoP 0290

fischer kehyksenkiinnittäjää S12 FUS varten (Muoviankkurit käytettäväksi betonissa ja muuratuissa rakenteissa) FI

1. Tuotetyypin yksilöllinen tunniste:	**DoP 0290**
2. Aiottu käyttötarkoitus (aiotut käyttötarkoitukset):	**Muoviankkuri useanlaiseen käyttöön betonissa ja muurauksessa, ei-rakenteellisissa sovituksissa (käyttökategoria b):, katso lisäys, erityisesti liitteet B1 - B3.**
3. Valmistaja:	**fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Saksa**
4. Valtuutettu edustaja:	**–**
5. Suoritustason pysyvyyden arvioinnissa ja varmentamisessa käytetty järjestelmä/käytetyt järjestelmät:	**2+**
6. Eurooppalainen arviointiasiakirja:	**EAD 330284-00-0604 (June 2018)**
Eurooppalainen tekninen arviointi:	**ETA-21/0742; 2022-09-14**
Teknisestä arvioinnista vastaava laitos:	**Kiwa Nederland B.V.**
Ilmoitettu laitos/ilmoitetut laitokset:	**2873 TU Darmstadt**

7. Ilmoitettu suoritustaso/ilmoitetut suoritustasot:

Mekaaninen kestävyys ja vakaus (BWR 4)

Vastustaa teräsvaurioita jännitekuormituksessa: Liite C1
Vastustaa teräs- tai polymeerivaurioita leikkauskuormituksessa: Liite C1
Vastustaa veto-, betoni- tai polymeerivaurioita jännitekuormituksessa (perusmateriaali a):NPD

Vastustaa jokaista kuormasuuntaa ilman konsolia (perusmateriaaliryhmät b): Liitteet C1, C2
Reunaetäisyys ja välistys (perusmateriaaliryhmä a):NPD
Reunaetäisyys ja välistys (perusmateriaaliryhmät b): Liite B2
Siirtymät lyhyt-kestoisessa ja pitkä-kestoisessa kuormituksessa: Liite C1

Kestävyys: Liitteet A3, B1

Turvallisuus tulipalon sattuessa (BWR 2)

Reaktio paloon:Luokka A1
Tulenkestävyys: NPD

8. Asianmukainen tekninen asiakirja ja/tai tekninen erityisasiakirja:	**–**

Edellä yksilöidyn tuotteen suoritustaso on ilmoitettujen suoritustasojen joukon mukainen. Tämä suoritustasoilmoitus on asetuksen (EU) N:o 305/2011 mukaisesti annettu edellä ilmoitetun valmistajan yksinomaisella vastuulla.

Valmistajan puolesta allekirjoittanut:

Dr.-Ing. Oliver Geibig, Toimitusjohtaja Liiketoimintayksikkö & Suunnittelu

Jürgen Grün, Toimitusjohtaja Kemia & Laatu

Tumlingen, 2022-09-28

Tämä suoritustasoilmoitus on laadittu useilla kielillä. Jos tulkinnasta syntyy erimielisyyttä, englanninkielinen versio on aina katsottava ensisijaiseksi.

Lisäys sisältää vapaaehtoisesti ilmoitettua ja täydentävää englanninkielistä tietoa, joka ylittää (kielestä riippumatta määritellyt) lakisääteiset vaatimukset.

Specific parts

1 Technical description of the product

The plastic anchor “fischer frame fixing S12 FUS” is a plastic anchor consisting of a polymeric sleeve which passes through the fixture and a special screw as expansion element which is screwed in the polymeric sleeve.

Polyamide PA6 of grey colour is used as material for the polymeric sleeve. The special screw is made of galvanised steel, galvanised steel with additional organic layer or stainless steel of corrosion resistance class II or III. There are two variants of the special screw: hexagonal screw and hexagonal screw with washer. Specific dimensions, drawings and material parameters are shown in Annex A.

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

The performances given in section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The plastic anchor “fischer frame fixing S12 FUS” is intended for anchorages subject to static and quasi-static loading in masonry. The applicable base material group is “b”.

The verifications and assessment methods on which this European Technical Assessment is based on lead to the assumption of a working life of the plastic anchor ” fischer frame fixing S12 FUS“ for the intended use of 50 years when installed in the works provided that the plastic anchor is subject to appropriate installation.

The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Basic Works Requirements 2: Safety in case of fire

Table 1 Basic Works Requirements 2: Safety in case of fire

Essential characteristic	Performance
Reaction to fire	Class A 1
Resistance to fire	no performance assessed

3.2 Basic Works Requirements 4: Mechanical resistance and stability

Table 2 Basic Works Requirements 4: Mechanical resistance and stability

Essential characteristic	Performance
Resistance to steel failure under tension loading	see Annex C 1
Resistance to steel or polymer failure under shear loading	see Annex C 1
Resistance in any load direction without lever arm	see Annex C 1 and Annex C 2
Edge distance and spacing	see Annex B 2
Displacements under short-term and long-term loading	see Annex C 1

3.3 Other essential characteristics

Table 3 Other essential characteristics

Essential characteristic		Performance
Durability	Corrosion of screw	for screws see Annex A 3 and Annex B 1
	High alkalinity of plastic sleeve	no negative effects

3.4 Reference documents

Following standards or EADs will be referred to in this European Technical Assessment. All undated references are to be understood as references to the dated versions listed below.

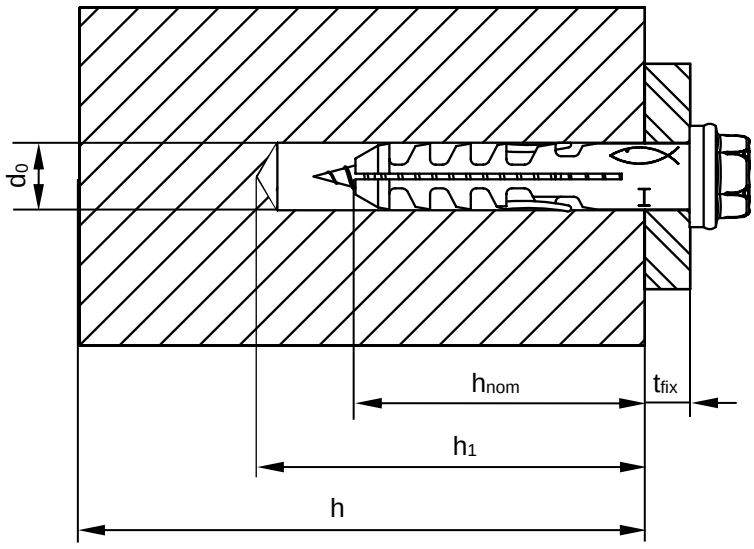
- EOTA European Assessment Document EAD 330284-00-0604 June 2018 Plastic anchors for redundant non-structural systems in concrete and masonry
- EOTA Technical Report TR 051 Edition April 2018 Job site tests of plastic anchors and screws
- EOTA Technical Report TR 064 Edition May 2018 Design of plastic anchors in conrete and masonry
- EN 771-2:2011+A1:2015 Specification for masonry units – Part 2: Calcium silicate
- EN 998-2:2010 Specification for mortar for masonry - Part 2: Masonry mortar
- EN 1993-1-4:2006 + A1:2015 Eurocode 3: Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels
- EN ISO 4042:2018-11 Fasteners – Electroplated coating systems

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

In accordance with EAD 330284-00-0604 the applicable European legal act is: 97/463/EC.

The System to be applied is: 2+.

Installed anchor S12 FUS



Legend

d_0 = Nominal drill hole diameter

h_{nom} = Overall plastic anchor embedment depth in the base material

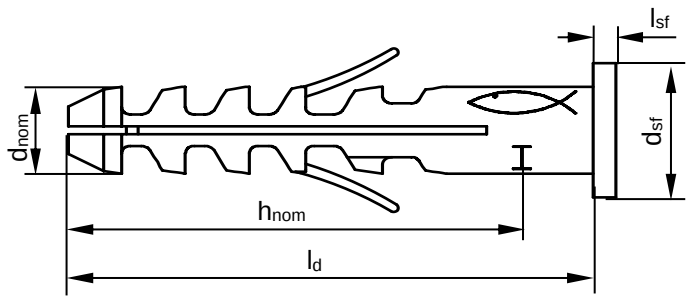
h_1 = Depth of drill hole to deepest point

h = Thickness of member (wall)

t_{fix} = Thickness of fixture including non-load-bearing layer

Figure not to scale

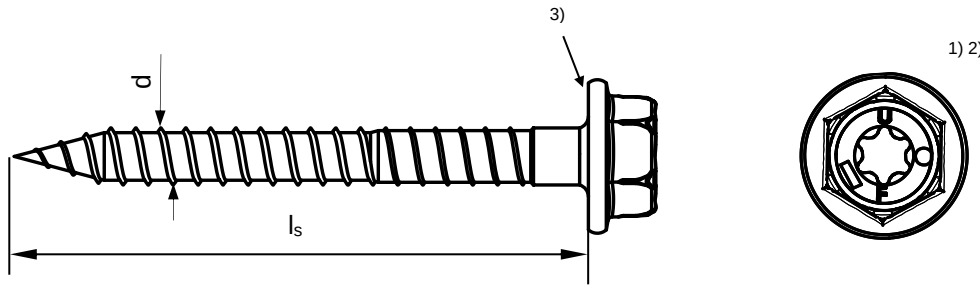
Anchor sleeve S12 FUS



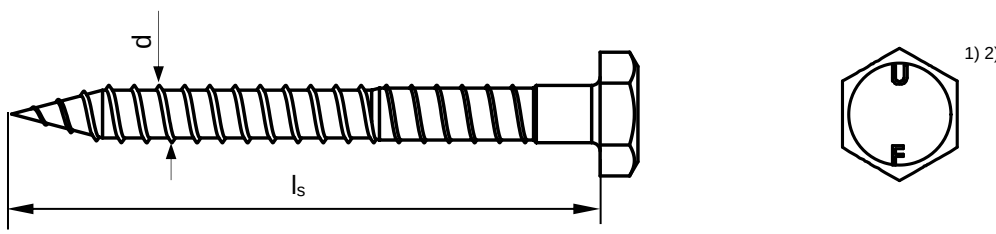
Marking:
Brand
Anchor type
Size
e.g. S12

Special Screws

Hexagonal screw with washer



Hexagonal screw



1) Additional marking for the special screw, stainless steel version: “A4“ or “R” or “A2”.
2) Internal driving feature for Torx bit is optional for hexagonal head.
3) Optional additional version with underhead ribs.

Figure not to scale

fischer frame fixing S12 FUS

Product description
Anchor types / special screws
Marking and dimensions

Annex A 2

Table A3.1: Dimensions

Anchor type	Anchor sleeve						Special screw	
	h_{nom} [mm]	d_{nom} [mm]	t_{fix} [mm]	l_d [mm]	l_{Sf} [mm]	d_{Sf} [mm]	d [mm]	l_S [mm]
S12 FUS	50	12	1 - 10	60	2,6	18	7,0	67[1)]/69[2)]

1) Valid for hexagonal screw.
2) Valid for hexagonal screw with washer.

Table A3.2: Materials

Name	Material
Anchor sleeve	Polyamide, PA6, colour grey
Special screw	- Galvanised steel gvz with Zn5/Ag or Zn5/An in accordance with EN ISO 4042 **or** - Galvanised steel gvz with Zn5/Ag or Zn5/An in accordance with EN ISO 4042 with additional organic layer (Zn5/Ag/T7 or Zn5/An/T7, resp.) in three layers (total layer thickness ≥ 6 µm) **or** - Stainless steel “A2” of corrosion resistance class CRC II in accordance with EN 1993-1-4 **or** - Stainless steel “A4” or “R” of corrosion resistance class CRC III in accordance with EN 1993-1-4

Specifications of intended use

Anchorages subject to:

- Static and quasi-static loads.
- Multiple use for non-structural systems.

Base materials:

- Calcium silicate solid brick, base material group “b”, as per EN 771-2, see Annex C 1 and C 2.
  Note: The characteristic resistance is also valid for larger brick sizes and larger compressive strength of the masonry unit.
- Mortar strength class of masonry ≥ M2,5 in accordance with EN 998-2.
- For other base materials of the base material group “b”, calcium silicate solid brick, the characteristic resistance of the anchor may be determined by job site tests in accordance to TR 051.

Temperature Range:

- b: - 20 °C to 80 °C (max. short term temperature + 80 °C and max long term temperature + 50 °C).

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions: Special screw made of zinc coated steel or stainless steel.
- The specific screw made of galvanised steel or galvanised steel with an additional organic layer may also be used in structures subject to external atmospheric exposure, if the area of the head of the screw is protected against moisture and driving rain after mounting of the fixing unit in this way, that intrusion of moisture into the anchor shaft is prevented. Therefore, there shall be an external cladding or a ventilated rainscreen mounted in front of the head of the screw and the head of the screw itself shall be coated with a soft plastic, permanently elastic bitumen-oil-combination coating (e.g. undercoating or body cavity protection for cars).
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist: Special screw made of stainless steel of corrosion resistance class CRC III.
- Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

Design:

- The anchorages are designed in accordance with TR 064 under the responsibility of an engineer experienced in anchorages and masonry work.
- Verifiable calculation notes and drawings shall be prepared taking account of the loads to be anchored, the nature and strength of the base materials and the dimensions of the anchorage members as well as of the relevant tolerances. The position of the anchor is indicated on the design drawings.
- Fasteners are only to be used for redundant non-structural application, in accordance with TR 064.

Installation:

- Drilling method according to Annex C 1 and C 2.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on the site.
- Installation temperature from -5 °C to +40 °C.
- Exposure to UV due to solar radiation of the anchor not protected ≤ 6 weeks.
- No ingress of water in the borehole at temperatures < 0 °C.

Table B2.1: Installation parameters

Anchor type				S12 FUS
Drill hole diameter	d_0	=	[mm]	12
Cutting diameter of drill bit	d_{cut}	≤	[mm]	12,5
Overall plastic anchor embedment depth in the base material[1)]	h_{nom}	≥	[mm]	50
Depth of drill hole to deepest point[1)]	h_1	≥	[mm]	75
Diameter of clearance hole in the fixture	d_f	≤	[mm]	13,5

1) See Annex A 1.

Table B2.2: Minimum thickness of member, edge distance and spacing in calcium silicate solid bricks, base material group "b"

Anchor type			S12 FUS
Minimum thickness of member[1)]	h_{min}	[mm]	100
Minimum spacing between anchor groups and / or single anchors	a_{min}	[mm]	250
Single anchor			
Minimum edge distance	c_{min}	[mm]	50
Anchor group			
Minimum spacing perpendicular to free edge	$s_{1,min}$	[mm]	65
Minimum spacing parallel to free edge	$s_{2,min}$	[mm]	65
Minimum edge distance	c_{min}	[mm]	50

1) Member thickness in accordance to Annex C 1 and C 2.

Scheme of distances and spacings in solid masonry, base material group "b"

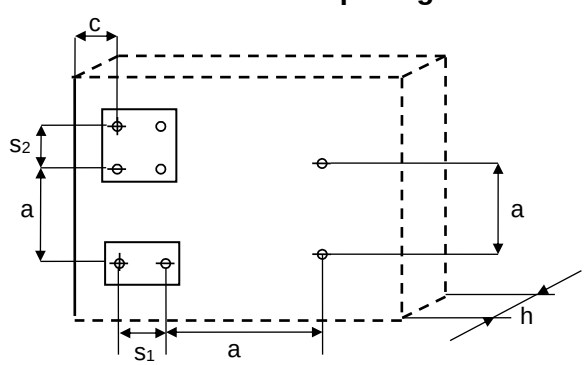


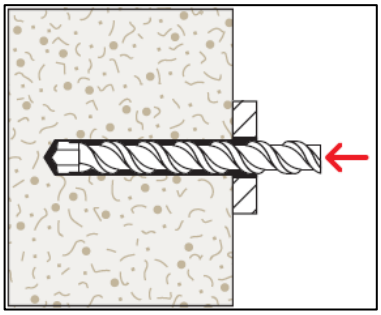
Figure not to scale

fischer frame fixing S12 FUS

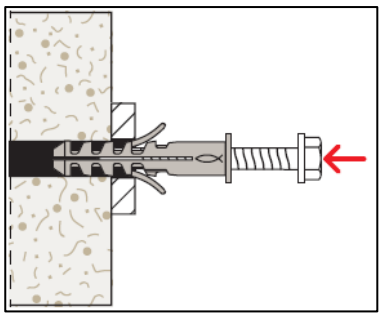
Intended use
Installation parameters
Minimum thickness of member, edge distances and spacings

Annex B 2

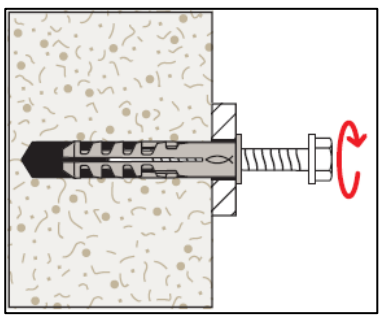
Installation instructions



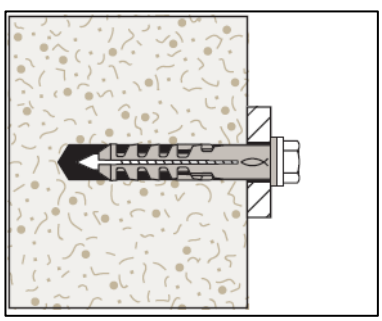
1. Drill the bore hole acc. to Table B 2.1 using the drill method hammer drilling, described in the corresponding Annex C 1 and C 2.



2. Insert anchor (screw and plug) by using a hammer until the collar of the plastic sleeve is flush with the surface of the fixture.



3. The screw is screwed-in until the head of the screw touches the sleeve. The anchor is correctly installed, when the head of the screw fits tight on the surface and nor the anchor sleeve neither the screw cannot be screwed-in any further.



4. Correctly installed anchor in calcium silicate solid bricks.

Table C1.1: Characteristic resistance of the special screw

Failure of expansion element (special screw)			S12 FUS	
			galvanised steel	stainless steel
Characteristic tension resistance	$N_{Rk,s}$	[kN]	**21,7**	
Partial safety factor	γ_{Ms} 1)	[-]	**1,55**	
Characteristic shear resistance	$V_{Rk,s}$	[kN]	**10,8**	
Partial safety factor	γ_{Ms} 1)	[-]	**1,29**	
Characteristic bending resistance of the screw				
Characteristic bending resistance	$M_{Rk,s}$	[Nm]	**20,6**	
Partial safety factor	γ_{Ms} 1)	[-]	**1,29**	

1) In absence of other national regulations.

Table C1.2: Displacements under tension and shear loading in calcium silicate solid bricks, base material group "b"

Displacements under			Tension load 1)		Shear load 1)	
Anchor type	h_{nom} [mm]	**F** [kN]	δ_{NO} [mm]	$\delta_{N\infty}$ [mm]	δ_{VO} [mm]	$\delta_{V\infty}$ [mm]
S12 FUS	**50**	0,50	0,14	0,14	0,60	0,90
		0,86	0,24	0,24	1,04	1,55

1) Intermediate values by linear interpolation.

Table C1.3: Characteristic resistance F_{Rk} in [kN] in calcium silicate solid bricks – base material group "b" 1)

Base material by specifying the bulk densitity [kg/dm³] *[Supplier Title, country]* Geometry, DF or nominal. size L x B x H [mm] and drilling method	Mean compressive strength / Min. compressive strength single brick as per EN 771 [N/mm²]	Characteristic resistance **F_{Rk}** [kN] Temperature range 50/80 °C h_{nom} [mm] ≥ 50
Calcium silicate solid brick KS; **ρ ≥ 1,8** as per EN 771-2 *e.g. CALDURAN Kalkzandsteen, NL* **5 DF** 437x100x198 Hammer drilling	12,5/10	**1,75** 3)
	15/12	**1,75** 3)
	20/16	**2,50** 3)
	20,7/-	**2,50** 3)
Partial safety factor	γ_{Mm} 2) [-]	**2,5**

1) Vertically perforation ≤ 15%; cross section reduced by perforation vertically to the resting area.
2) In absence of other national regulations.
3) Only valid for edge distance c_{min} = 50 mm.

fischer frame fixing S12 FUS

Performances
Characteristic resistance and bending resistance of the special screw, displacements under tension and shear loading, characteristic resistance in calcium silicate solid brick

Annex C 1

Table C2.1: Characteristic resistance F_{Rk} in [kN] in calcium silicate solid bricks – base material group "b"[1)]

Base material by specifying the bulk densitity [kg/dm³] *[Supplier Title, country]* Geometry, DF or nominal. size L x B x H [mm] and drilling method	Mean compressive strength / Min. compressive strength single brick as per EN 771 [N/mm²]	Characteristic resistance **F_{Rk}** [kN] Temperature range 50/80 °C h_{nom} [mm] ≥ 50
Calcium silicate solid brick KS; **ρ ≥ 1,8** as per EN 771-2 *e.g. CALDURAN Kalkzandsteen, NL* **5 DF** 437x100x198 Hammer drilling	12,5/10	**2,10[3)]**
	15/12	**2,10[3)]**
	20/16	**3,00[3)]**
	20,7/-	**3,00[3)]**
Partial safety factor	γ_{Mm} [2)] [-]	**2,5**

1) Vertically perforation ≤ 15%; cross section reduced by perforation vertically to the resting area.
2) In absence of other national regulations.
3) Maximum possible characteristic resistance F_{Rk} with edge distance c_1 and c_2 according to EAD 330284-00-0604 equation (2.26) till (2.29), page 24 and 25:

$$V_{Rk,solid} = k \cdot \sqrt{d_{nom}} \cdot \left(\frac{h_{nom}}{d_{nom}}\right)^{0,2} \cdot \sqrt{f_b} \cdot c_1^{1,5} \cdot \left(\frac{c_2}{1,5 \cdot c_1}\right)^{0,5} \cdot \left(\frac{h}{1,5 \cdot c_1}\right)^{0,5} \quad (2.26)$$

with:

$$\left(\frac{c_2}{1,5 \cdot c_1}\right)^{0,5} \leq 1,0 \quad (2.27)$$

$$\left(\frac{h}{1,5 \cdot c_1}\right)^{0,5} \leq 1,0 \quad (2.28)$$

$$h = h_{min} \quad (2.29)$$

$V_{Rk,solid}$	[kN]	=	Characteristic shear resistance for brick edge failure in base material group b
k	[-]	=	Factor for load direction: 0,225 for shear loading in direction to the free edge 0,45 for shear loading in other directions
d_{nom}	[mm]	=	Outside diameter of anchor
h	[mm]	=	Thickness of member (wall)
h_{min}	[mm]	=	Minimum thickness of member determined by manufacturer
h_{nom}	[mm]	=	Overall anchor embedment depth in the base material
c_1	[mm]	=	Edge distance closest to the edge in loading direction given by the manufacturer
c_2	[mm]	=	Edge distance perpendicular to direction 1 given by the manufacturer
f_b	[N/mm²]	=	Normalised mean compressive strength of the bricks of base material group b

Resulting application-specific equation for fischer S12 FUS:

$$3,0\ kN \geq F_{Rk} \geq k \cdot \sqrt{10\ mm} \cdot \left(\frac{50\ mm}{10\ mm}\right)^{0,2} \cdot \sqrt{f_b} \cdot c_1^{1,5} \cdot \left(\frac{c_2}{1,5 \cdot c_1}\right)^{0,5} \cdot \left(\frac{100\ mm}{1,5 \cdot c_1}\right)^{0,5}$$

with $\left(\frac{c_2}{1,5 \cdot c_1}\right)^{0,5} \leq 1,0$ and $\left(\frac{100\ mm}{1,5 \cdot c_1}\right)^{0,5} \leq 1,0$ and $h = h_{min} = 100\ mm$