SOUDAL

Technical Data Sheet

SOUDAFIX VE400-SF ARCTIC

Technical Data

Base	Vinylester styrene free		
Consistency	Stable paste		
Curing system	Chemical reaction		
Processing time and curing time on dry substrate On wet substrate = time x 2 Cartridge temperature between -20°C and +10°C	Temperature ≥ -20°C ≥ -15°C ≥ -10°C ≥ -5°C ≥ 0°C ≥ +5°C ≥ +10°C	Start 75 min 55 min 35 min 20 min 10 min 6 min 6 min	Full cure 24 h 16 h 10 h 5 h 2.5 h 80 min 60 min
Specific Gravity	1,77 g/cm³		
Temperature Resistance	-40°C to +120°C		
Elasticity modulus	14000 N/mm²		
Maximum bending strength	15 N/mm²		
Maximum compression strength	100 N/mm²		

Description:
SOUDAFIX VE400-SF ARCTIC is a two-component anchoring resin for the pressure-free securing of threaded rods (ETA: M8-M30), studs, reinforcement bars (ETA: Ø8-Ø32), threaded collars, profiles etc in various solid and hollow materials, such as cracked and uncracked concrete, solid brick, hollow brick, porous concrete, natural stone (see remarks), plasterboard walls, etc…

Properties:
- Good and easy to process
- Easy to use and to apply
- Fast cure
- Wide application area, even in wet drill holes, under water (also sea water) and at temperature as low as -10°C
- Overhead installation allowed
- Styrene free (low odour)
- Cartridge re-usable by simply exchanging static mixer
- Watertight and impermeable fixing
- High chemical resistance (chlorinated pool water and sea water)
- European Technical Assessment ETA 10/0167 based on EAD 330499-02-0601-0601 for application in cracked and uncracked concrete.
- European Technical Assessment ETA 21/0170 based on EAD 330076-01-0604 for application in masonry.

Application area:
Securing of heavy loads in solid and hollow building materials. Pressure free anchoring even close to edges. Can be used as repair mortar.

Packaging:
Colour: dark grey after mixing
Cartridge: 300 ml foil bag cartridge for standard skeleton gun.

Shelf life and Storage:
18 months in original packaging. Store at cool and dry place at temperatures between -20°C and +25°C.

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Substrates:
Type: All usual porous building substrates, poor adhesion on smooth non-porous materials.
State: Clean, free of dust and grease.

Application:
Application method: standard skeleton gun for 280 ml cartridge, preferably heavy duty. Do not use a compressed air gun.
Application temperature: -20°C to +10°C
Clean: Before cure: wipe off excess of product and clean afterwards with white spirit or acetone.
After cure: it is recommended to let the product fully cure, so that it can easily be removed mechanically with hammer and chisel.
Repair: with the same material

Safety recommendations:
Apply the usual industrial hygiene precautions.
Only use in well-ventilated spaces.
Consult the label for more information.

Remarks:
The salt in seawater does not adversely affect the chemical curing reaction. Use in seawater is not covered by the ETA certificate because there is no EAD (European Assessment Document) test procedure for seawater applications.
There is a risk of staining on porous substrates such as natural stone.

Instructions for use:
- Drill hole to recommended depth.
- Clean the drilled hole by successive blowing out, brushing and blowing out (4x each time).
- Open the foil packaging and screw static mixing nozzle onto the cartridge.
- Dispense the first 10 cm of the product to waste (on piece of cardboard) until an even colour (dark grey) is achieved, and the product is well mixed.
- Mark embedment depth on the anchor rod. The anchor rod shall be free of dirt, grease or other foreign material.
- Solid stone: fill the drill hole from bottom up. Hollow brick: insert sleeve and fill it bottom up, so that the resin is pressed through the tiny holes of the sleeve.
- Apply anchor rod clockwise.
- Inspect the drill hole for adequate filling.
- Observe hardening time. Don't move the anchoring rod during curing.
- Leave the excess of product to cure as well. Remove it mechanically with hammer and chisel once cured.
- Install component, applying the right torque.

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Installation parameters threaded rods:

Diameter threaded rod	d	mm	M8	M10	M12	M16	M20	M24	M27	M30
Drill diameter	d_0	mm	10	12	14	18	22	28	30	35
Min. anchorage depth	$h_{ef,min}$	mm	60	60	70	80	90	96	108	120
Max. anchorage depth	$h_{ef,max}$	mm	160	200	240	320	400	480	540	600
Min. edge distance	c_{min}	mm	40	50	60	80	100	120	135	150
Min. axial distance	s_{min}	mm	40	50	60	80	100	120	135	150
Tightening torque	T_{inst}	Nm	10	20	40	60	100	170	250	300

Installation parameters reinforcement bars:

Diameter reinforcement bar	d	mm	Ø8	Ø 10	Ø 12	Ø14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Drill diameter	d_0	mm	10 or 12	12 or 14	14 or 16	18	20	25	32	35	40
Min. anchorage depth	$h_{ef,min}$	mm	60	60	70	75	80	90	100	112	128
Max. anchorage depth	$h_{ef,max}$	mm	160	200	240	280	320	400	500	560	640
Min. edge distance	c_{min}	mm	40	50	60	70	80	100	125	140	160
Min. axial distance	s_{min}	mm	40	50	60	70	80	100	125	140	160

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Tabel C1: Characteristic values for steel tension and shear of threaded rods											
Diameter threaded rods			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Characteristic values for tension, steel failure											
Characteristic tensile strength, steel class 4.6 en 4.8	N_{Rks}	kN	15	23	34	63	98	141	184	224
Characteristic tensile strength, steel class 5.6 en 5.8	N_{Rks}	kN	18	29	42	78	122	176	230	280
Characteristic tensile strength, steel class 8.8	N_{Rks}	kN	29	46	67	125	196	282	368	449
Characteristic tensile strength, stainless steel A2, A4 and HCR class 50	N_{Rks}	kN	18	29	42	79	123	177	230	281
Characteristic tensile strength, stainless steel A2, A4 and HCR class 70	N_{Rks}	kN	26	41	59	110	171	247	-	-
Characteristic tensile strength, stainless steel A4 and HCR class 80	N_{Rks}	kN	29	46	67	126	196	282	-	-
Characteristic values for tension, partial factor											
Partial factor steel class 4.6	$\gamma_{Ms,N}$ [1]		2.0							
Partial factor steel class 4.8	$\gamma_{Ms,N}$ [1]		1.5							
Partial factor steel class 5.6	$\gamma_{Ms,N}$ [1]		2.0							
Partial factor steel class 5.8	$\gamma_{Ms,N}$ [1]		1.5							
Partial factor steel class 8.8	$\gamma_{Ms,N}$ [1]		1.5							
Partial factor stainless steel A2, A4 and HCR class 50	$\gamma_{Ms,N}$ [1]		2.86							
Partial factor stainless steel A2, A4 and HCR class 70	$\gamma_{Ms,N}$ [1]		1.87							
Partial factor stainless steel A4 and HCR class 80	$\gamma_{Ms,N}$ [1]		1.6							
Characteristic shear resistance, steel failure											
Steel failure without lever arm											
Characteristic shear resistance, steel class 4.6 and 4.8	V^0_{Rks}	kN	9	14	20	38	59	85	110	135
Characteristic shear resistance, steel class 5.6 and 5.8	V^0_{Rks}	kN	11	17	25	47	74	106	138	140
Characteristic shear resistance, steel class 8.8	V^0_{Rks}	kN	15	23	34	63	98	141	184	224
Characteristic shear resistance, stainless steel A2, A4 and HCR class 50	V^0_{Rks}	kN	9	15	21	39	61	88	115	140
Characteristic shear resistance, stainless steel A2, A4 and HCR class 70	V^0_{Rks}	kN	13	20	30	55	86	124	-	-
Characteristic shear resistance, stainless steel A4 and HCR class 80	V^0_{Rks}	kN	15	23	34	63	98	141	-	-
Steel failure with lever arm											
Characteristic shear resistance, steel class 4.6 and 4.8	M^0_{Rks}	kN	15	30	52	133	260	449	666	900
Characteristic shear resistance, steel class 5.6 and 5.8	M^0_{Rks}	kN	19	37	65	166	324	560	833	1123
Characteristic shear resistance, steel class 8.8	M^0_{Rks}	kN	30	60	105	266	519	896	1333	1797
Characteristic shear resistance, stainless steel A2, A4 and HCR class 50	M^0_{Rks}	kN	19	37	66	167	325	561	832	1125
Characteristic shear resistance, stainless steel A2, A4 and HCR class 70	M^0_{Rks}	kN	26	52	92	232	454	784	-	-
Characteristic shear resistance, stainless steel A4 and HCR class 80	M^0_{Rks}	kN	30	59	105	266	519	896	-	-
Characteristic shear resistance, partial factor											
Partial factor steel class 4.6	$\gamma_{Ms,V}$ [1]		1.67							
Partial factor steel class 4.8	$\gamma_{Ms,V}$ [1]		1.25							
Partial factor steel class 5.6	$\gamma_{Ms,V}$ [1]		1.67							
Partial factor steel class 5.8	$\gamma_{Ms,V}$ [1]		1.25							
Partial factor steel class 8.8	$\gamma_{Ms,V}$ [1]		1.25							
Partial factor stainless steel A2, A4 and HCR class 50	$\gamma_{Ms,V}$ [1]		2.38							
Partial factor stainless steel A2, A4 and HCR class 70	$\gamma_{Ms,V}$ [1]		1.56							
Partial factor stainless steel A4 and HCR class 80	$\gamma_{Ms,V}$ [1]		1.33							

1) In absence of national regulation

Remark: The directives contained in this documentation are the result of our experiments and of our experience and have been submitted in good faith. Because of the diversity of the materials and substrates and the great number of possible applications which are out of our control, we cannot accept any responsibility for the results obtained. In every case it is recommended to carry out preliminary experiments.

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Table C3 Characteristic values of tension loads under static and quasi-static action											
Diameter threaded rod				**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Characteristic values of tension loads, steel failure											
Characteristic tension resistance		$N_{Rk,s}$	kN	$A_s * f_{uk}$ (or see table C1)							
Partial factor		$\gamma_{Ms,N}$	-	See table C1							
Combined pull-out and concrete failure											
Characteristic bond resistance in non-cracked concrete C20/25											
Dry and wet concrete	Temperature range I: 40°C to 24°C	$\tau_{Rk,ucr}$	N/mm²	10	12	12	12	12	11	10	9
	Temperature range II: 80°C to 50°C	$\tau_{Rk,ucr}$	N/mm²	7.5	9	9	9	9	8.5	7.5	6.5
	Temperature range III: 120°C to 72°C	$\tau_{Rk,ucr}$	N/mm²	5.5	6.5	6.5	6.5	6.5	6.5	5.5	5.0
Flooded bore hole	Temperature range I: 40°C tot 24°C	$\tau_{Rk,ucr}$	N/mm²	7.5	8.5	8.5	8.5	No performance declared			
	Temperature range II: 80°C tot 50°C	$\tau_{Rk,ucr}$	N/mm²	5.5	6.5	6.5	65				
	Temperature range III: 120°C tot 72°C	$\tau_{Rk,ucr}$	N/mm²	4.0	5.0	5.0	5.0				
Characteristic bond resistance in cracked concrete C20/25											
Dry and wet concrete	Temperature range I: 40°C to 24°C	$\tau_{Rk,cr}$	N/mm²	4,0	5,0	5,5	5,5	5,5	5,5	6,5	6,5
	Temperature range II: 80°C to 50°C	$\tau_{Rk,cr}$	N/mm²	2,5	3,5	4,0	4,0	4,0	4,0	4,5	4,5
	Temperature range III: 120°C to 72°C	$\tau_{Rk,cr}$	N/mm²	2,0	2,5	3,0	3,0	3,0	3,0	3,5	3,5
Flooded bore hole	Temperature range I: 40°C tot 24°C	$\tau_{Rk,cr}$	N/mm²	4,0	4,0	5,5	5,5	No performance declared			
	Temperature range II: 80°C tot 50°C	$\tau_{Rk,cr}$	N/mm²	2,5	3,0	4,0	4,0				
	Temperature range III: 120°C tot 72°C	$\tau_{Rk,cr}$	N/mm²	2,0	2,5	3,0	3,0				
Reduction factor Ψ^0_{sus} in cracked and uncracked concrete C20/25											
Dry and wet concrete and water-filled borehole	Temperature range I: 40°C tot 24°C	Ψ^0_{sus}	-	0,73							
	Temperature range II: 80°C tot 50°C	Ψ^0_{sus}	-	0,62							
	Temperature range III: 120°C tot 72°C	Ψ^0_{sus}	-	0,57							
Increasing factors for concrete		Ψ_c	-	$(f_{ck} / 20)^{0,11}$							
Characteristic bond resistance depending on concrete class		$\tau_{Rk,ucr}$ =		$\Psi_c * \tau_{Rk,ucr}$ (C20/25)							
		$\tau_{Rk,cr}$ =		$\Psi_c * \tau_{Rk,cr}$ (C20/25)							
Concrete conce failure											
Relevant parameter				See ETA Table C2							
Concrete edge failure											
Relevant parameter				See ETA Table C2							
Installation factor (dry and wet concrete)		γ_{inst}		1.0	1.2						
Installation factor (flooded bore hole)		γ_{inst}		1,4				No performance declared			

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Table C4: Characteristic values of shear loads under static and quasi-static action										
Diameter threaded rod			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Steel failure without lever arm										
Characteristic shear resistance steel class 4.6, 4.8, 5.6 and 5.8	$V^0_{Rk,s}$	kN	0,6 * A_s * f_{uk} (or see table C1)							
Characteristic shear resistance steel class 8.8, stainless steel A2, A4 and HCR, all classe	$V^0_{Rk,s}$	kN	0,5 * A_s * f_{uk} (or see table C1)							
Partial factor	$\gamma_{Ms,V}$	-	See table C1							
Ductility factor	k_7	-	1,0							
Steel failure with lever arm										
Characteristic bending moment	$M^0_{Rk,s}$	Nm	1,2 * W_{el} * f_{uk} (of zie tabel C1)							
Elastic section modulus	W_{el}	mm³	31	62	109	277	541	935	1387	1874
Partial safety factor	$\gamma_{Ms,V}$		See table C1							
Concrete pry-out failure										
Factor	k_8	-	2.0							
Installation factor	γ_{inst}	-	1.0							
Concrete edge failure										
Effective anchor length	l_f	mm	min(h_{ef} ; 12 d_{nom})						min(h_{ef};300 m_m)	
Outside diameter of fastener	d_{nom}	mm	8	10	12	16	20	24	27	30
Installation factor	γ_{inst}	-	1.0							

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Table C7: Characteristic values of tension loads under static and quasi-static action												
Diameter reinforcing bar				**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 25**	**Ø 28**	**Ø 32**
Steel failure												
Characteristic tension resistance		$N_{Rk,s}$	kN	$A_s \times f_{uk}$ [1]								
		$N_{Rk,s,eq}$	kN	$1,0 \cdot A_s \times f_{uk}$ [1]								
Cross section area		A_s	mm²	50	79	113	154	201	314	491	616	804
Partiële veiligheidsfaktor		$\gamma_{Ms,N}$		1,4 [2]								
Combined pull-out and concrete failure												
Characteristic bond resistance in non-cracked concrete C20/25												
Dry and wet concrete	Temperature range I: 40°C to 24°C	$\tau_{Rk,ucr}$	N/mm²	10	12	12	12	12	12	11	10	8.5
	Temperature range II: 80°C to 50°C	$\tau_{Rk,ucr}$	N/mm²	7.5	9	9	9	9	9	8.0	7.0	6.0
	Temperature range III: 120°C to 72°C	$\tau_{Rk,ucr}$	N/mm²	5.5	6.5	6.5	6.5	6.5	6.5	6.0	5.0	4.5
Flooded bore hole	Temperature range I: 40°C to 24°C	$\tau_{Rk,ucr}$	N/mm²	7.5	8.5	8.5	8.5	8.5	No performance declared			
	Temperature range II: 80°C to 50°C	$\tau_{Rk,ucr}$	N/mm²	5.5	6.5	6.5	6.5	6.5				
	Temperature range III: 120°C to 72°C	$\tau_{Rk,ucr}$	N/mm²	4.0	5.0	5.0	5.0	5.0				
Characteristic bond resistance in cracked concrete C20/25												
Dry and wet concrete	Temperature range I: 40°C to 24°C	$\tau_{Rk,ucr}$	N/mm²	4,0	5,0	5,5	5,5	5,5	5,5	5,5	6,5	6,5
	Temperature range II: 80°C to 50°C	$\tau_{Rk,ucr}$	N/mm²	2,5	3,5	4,0	4,0	4,0	4,0	4,0	4,5	4,5
	Temperature range III: 120°C to 72°C	$\tau_{Rk,ucr}$	N/mm²	2,0	2,5	3,0	3,0	3,0	3,0	3,0	3,5	3,5
Flooded bore hole	Temperature range I: 40°C to 24°C	$\tau_{Rk,ucr}$	N/mm²	4,0	4,0	5,5	5,5	5,5	No performance declared			
	Temperature range II: 80°C to 50°C	$\tau_{Rk,ucr}$	N/mm²	2,5	3,0	4,0	4,0	4,0				
	Temperature range III: 120°C to 72°C	$\tau_{Rk,ucr}$	N/mm²	2,0	2,5	3,0	3,0	3,0				
Reduction factor Ψ^0_{sus} in cracked and non-cracked concrete C20/25												
Dry and wet concrete and flooded bore hole	Temperature range I: 40°C to 24°C	Ψ^0_{sus}	-	0,73								
	Temperature range II: 80°C to 50°C	Ψ^0_{sus}	-	0,62								
	Temperature range III: 120°C to 72°C	Ψ^0_{sus}	-	0,57								
Increasing factors for concrete		Ψ_c	-	$(f_{ck} / 20)^{0,11}$								
Characteristic bond resistance depending on concrete class		$\tau_{Rk,ucr}$ =		$\Psi_c * \tau_{Rk,ucr}$ (C20/25)								
		$\tau_{Rk,cr}$ =		$\Psi_c * \tau_{Rk,cr}$ (C20/25)								
Concrete cone failure												
Relevant parameter				See Table C2								
Concrete edge failure												
Relevant parameter				See Table C2								
Installation factor (dry and wet concrete)		γ_{inst}		1.0	1.2							
Installation factor (flooded bore hole)		γ_{inst}		1,4					No performance declared			

[1] f_{uk} shell be taken from the specifications of reinforcing bars

[2] In absence of national regulation

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Table C8: Characteristic values of shear loads under static and quasi-static action											
Diameter reinforcing bar			**Ø 8**	**Ø 10**	**Ø 12**	**Ø 14**	**Ø 16**	**Ø 20**	**Ø 25**	**Ø 28**	**Ø 32**
Steel failure without lever arm											
Characteristic shear resistance	$V_{Rk,s}$	kN	$0{,}50 \times A_s \times f_{uk}$ [1]								
Cross section area	A_s	mm²	50	79	113	154	201	314	491	616	804
Partial factor	$\gamma_{Ms,V}$	-	1,5 [2]								
Ductility factor	k_7	-	1,0								
Steel failure with lever arm											
Characteristic bending moment	$M^0_{Rk,s}$	Nm	$1{,}2 \times W_{el} \times f_{uk}$ [1]								
Elastic section modulus	W_{el}	mm³	50	98	170	269	402	785	1534	2155	3217
Partial factor	$\gamma_{Ms,V}$		1,5 [2]								
Concrete pry-out failure											
Factor	k_8	-	2.0								
Installation factor	γ_{inst}	-	1,0								
Concrete edge failure											
Effective length of anchor	l_f	mm	$\min(h_{ef}; 12\, d_{nom})$						$\min(h_{ef}; 300\ m_m)$		
Effective length of anchor	d_{nom}	mm	8	10	12	14	16	20	25	28	32
Installation factor	γ_{inst}	-	1.0								

[1] f_{uk} shall be taken from the specifications of reinforcing bars

[2] In absence of national regulation