abe.® chemical anchor GP

tradition • innovation • quality

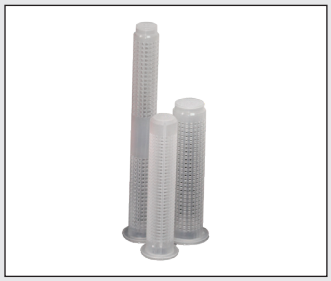
DO-IT-YOURSELF

CONCRETE REPAIR & PROTECTION

GENERAL PURPOSE, LOW VOC, STYRENE FREE, TWO PART POLYESTER RESIN CHEMICAL ANCHOR IN A SINGLE, EASY DISPENSING CARTRIDGE.

For fixing railings

Anchor rods in solid concrete



In hollow concrete and brick use sleeves

DESCRIPTION

abe® chemical anchor GP is a general purpose, low VOC, styrene free, two part polyester resin chemical anchor in a single, easy dispensing cartridge.

USES

- Anchorage on any supporting material, in solid and hollow materials.
- For structural anchoring for light to medium loads.
- On brick, masonry and concrete.
- On marble, natural stone and wood.
- Suitable for fixing screw sleeves, threaded rods, anchoring hollow panels, railings, shutters, façade cladding, reinforcement bars, screw sleeves, etc.

Note: Use in Porous Substrates

This bonded anchor is not intended for use as a cosmetic or decorative product. When anchoring into porous or reconstituted stone it is recommended that technical assistance is sought. Due to the nature of the product, migration of the monomer in the resin may cause staining in certain materials. If you are still uncertain, it is advisable to test the resin by applying it in a small, discrete area and testing before using the resin on the project.

ADVANTAGES

- Easy application and economical.
- Does not expand, does not create additional stresses on base material.
- Quick application and turnaround time.
- High penetration into porous areas.
- Low odour, can be used indoors.
- Good chemical resistance to corrosion by acids and alkalis.
- Thixotropic texture.
- Rapid cure & strong grip.
- Suitable for applications in damp conditions.
- Static mixer included.

SURFACE PREPARATION

Surfaces must be clean, dry, free from grease, dust, loose particles and other contaminants. This is carried out by using a brush and/or oil free compressed air.

MIXING

The resin and hardener are mixed only during extrusion.

Fix the static mixer onto the cartridge and ensure that the extruded product is perfectly mixed (uniform in colour).

This is done by extruding 5 cm of product to ensure that the

mix is homogeneous and ready for the application.

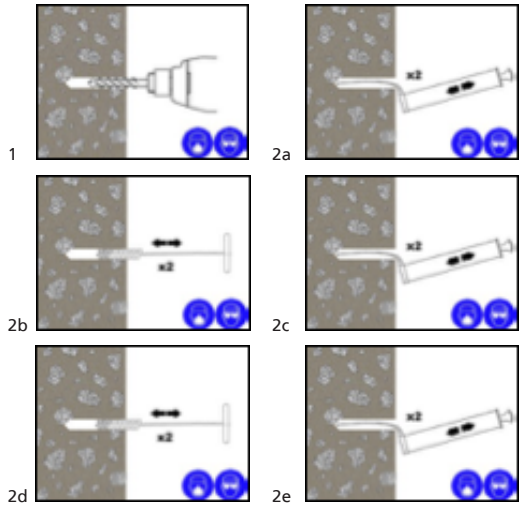
APPLICATION

Solid Substrate Installation Method

1. Drill the hole to the correct diameter and depth. This can be done with either a rotary percussion or rotary hammer drilling machine depending upon the substrate.
2. Thoroughly clean the hole in the following sequence using a brush with the required extensions and a source of clean compressed air. For holes of 400 mm or less deep, a blow pump may be used: Blow Clean x 2 → Brush Clean x 2 → Blow Clean x 2 → Brush Clean x 2 → Blow Clean x 2.

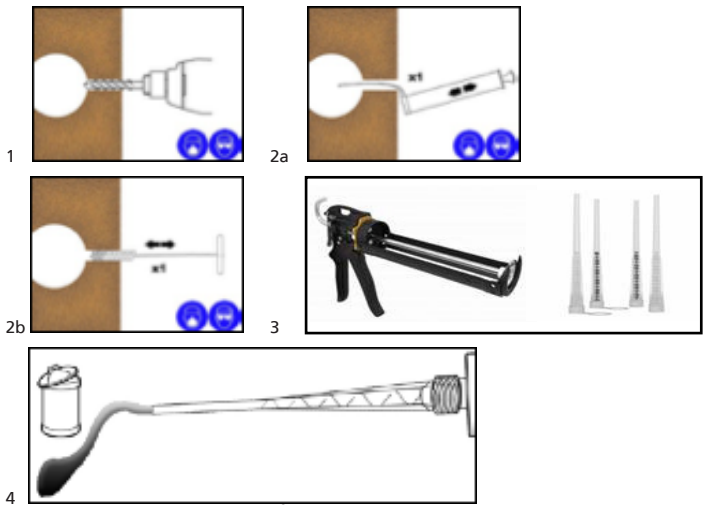
   If the hole collects water, the current best practice is to remove standing water before cleaning the hole and injecting the resin. Ideally, the resin should be injected into a properly cleaned, dry hole.
3. Select the appropriate static mixer nozzle for the installation, open the cartridge/foil pack and screw nozzle onto the mouth of the cartridge. Insert the cartridge into a good quality applicator.
4. Extrude the first part of the cartridge to waste until an even colour has been achieved without streaking in the resin.
5. If necessary, cut the extension tube to the depth of the hole and push onto the end of the mixer nozzle, and (for rebars 16 mm dia. or more) fit the correct resin stopper to the other end. Attach extension tubing and resin stopper.

6. Insert the mixer nozzle (resin stopper / extension tube if applicable) to the bottom of the hole. Begin to extrude the resin and slowly withdraw the mixer nozzle from the hole ensuring that there are no air voids as the mixer nozzle is withdrawn. Fill the hole to approximately ½ to ¾ full and withdraw the nozzle completely.
7. Insert the clean threaded bar, free from oil or other release agents, to the bottom of the hole using a back and forth twisting motion ensuring all the threads are thoroughly coated. Adjust to the correct position within the stated working time.



HOLLOW SUBSTRATE INSTALLATION METHOD

1. Drill the hole to the correct diameter and depth. This should be done with a rotary percussion drilling machine to reduce spalling.
2. Thoroughly clean the hole in the following sequence using the correct brush with the required extensions and a source of clean compressed air. For holes of 400 mm or less deep, a blow pump may be used: Brush Clean x1. Blow Clean x1.
3. Select the appropriate static mixer nozzle for the installation, open the cartridge/foil pack and screw nozzle onto the mouth of the cartridge. Insert the cartridge into a good quality applicator.
4. Extrude the first part of the cartridge to waste until an even colour has been achieved without streaking in the resin.
5. Select the appropriate perforated sleeve and insert into the hole.
6. Insert the mixer nozzle to the bottom of the perforated sleeve, withdraw 2-3 mm then begin to extrude the resin and slowly withdraw the mixer nozzle from the hole ensuring that there are no air voids as the mixer nozzle is withdrawn. Fill the perforated sleeve and withdraw the nozzle completely.
7. Insert the clean threaded bar, free from oil or other release agents, to the bottom of the hole using a back and forth twisting motion ensuring all the threads are thoroughly coated. Adjust to the correct position within the stated working time.
8. Any excess resin will be expelled from the hole evenly around the steel element showing that the hole is full. This excess resin should be removed from around the mouth of the hole before it sets.
9. Leave the anchor to cure. Do not disturb the anchor until the appropriate loading time, has elapsed depending on the substrate conditions and ambient temperature.
10. Attach the fixture and tighten the nut to the recommended torque. Do not overtighten.



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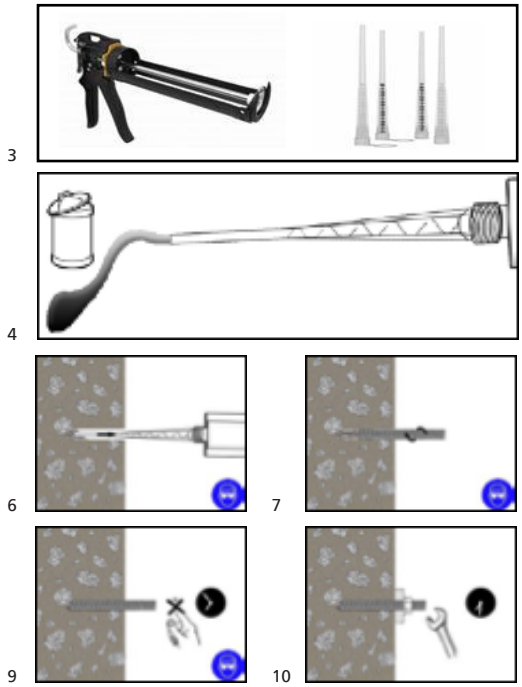
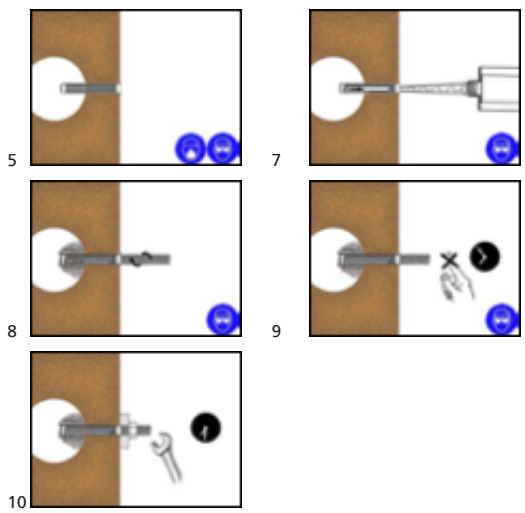




WORKING & LOADING TIMES			
Cartridge Temperature	**T Work**	**Base Material Temperature**	**T Load**
Min +5 °C	18 minutes	Min +5 °C	145 minutes
+5 °C to +10 °C	10 minutes	+5 °C to +10 °C	145 minutes
+10 °C to +20 °C	6 minutes	+10 °C to +20 °C	85 minutes
+20 °C to +25 °C	5 minutes	+20 °C to +25 °C	50 minutes
+25 °C to +30 °C	4 minutes	+25 °C to +30 °C	40 minutes
+30 °C	4 minutes	+30 °C	35 minutes

Note: T Work is typical gel time at highest base material temperature in the range. T Load is minimum set time required until load can be applied at the lowest base material temperature in the range.

INSTALLATION PARAMETERS - THREADED RODS								
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Nominal Drill Hole Diameter	d_o	mm	10	12	14	18	22	26
Diameter of Cleaning Brush	d_b	mm	H14	H14	H20	H20	H29	H29
Torque Moment	T_{inst}	Nm	10	20	40	80	120	160
Minimum Embedment Depth								
Embedment Depth	h_{ef}	mm	64	80	96	128	160	192
Minimum Edge Distance	c_{min}	mm	40	40	50	65	80	95
Minimum Spacing	s_{min}	mm	40	40	50	65	80	95
Minimum Member Thickness	h_{min}	mm	h_{ef} + 30 mm ≥ 100mm			h_{ef} + $2d_o$		
Maximum Embedment Depth								
Embedment Depth	h_{ef}	mm	96	120	144	192	240	288
Minimum Edge Distance	c_{min}	mm	50	60	70	95	120	145
Minimum Spacing	s_{min}	mm	50	60	70	95	120	145
Minimum Member Thickness	h_{min}	mm	h_{ef} + 30 mm ≥ 100mm			h_{ef} + $2d_o$		

USING WITH THREADED RODS IN UNCRACKED CONCRETE								
Combined pullout and concrete cone failure in uncracked concrete C20/25 (Temperature Range: -40 °C to +80 °C)								
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Characteristic Bond Resistance in Dry/Wet Concrete	$\tau_{Rk,uncr}$	N/mm²	7.0	7.0	6.5	6.5	6.0	6.0
Partial Safety Factor	g_{Mp}	-	1.8	1.8	1.8	1.8	1.8	1.8
Factor for Concrete	Ψ_c	C25/30	1.04					
		C30/37	1.08					
		C40/50	1.15					
		C50/60	1.19					

SPLITTING FAILURE								
Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Edge Distance	$C_{cr,sp}$	mm	$2h^{ef}$					
Spacing	$S_{cr,sp}$	mm	2 * $C_{cr,sp}$					
Partial Safety Factor	g_{Msp}	-	1.8					

Tension load calculations for combined pullout and concrete cone failure at various embedment depths using threaded rods in dry/wet, C20/25 uncracked concrete (Temperature Range: -40 °C to +80 °C)

Property	Symbol	Unit	M8	M10	M12	M16	M20	M24
Effective embedment Depth = 8d	h_{ef}	mm	64	80	96	128	160	192
Characteristic Load	$N^0_{Rk,p}$	kN	11.26	17.59	23.52	41.82	60.32	86.86
Partial Safety Factor	g_{Mp}	-	1.80	1.80	1.80	1.80	1.80	1.80
Effective embedment Depth = 10d	h_{ef}	mm	80	100	120	160	200	240
Characteristic Load	$N^0_{Rk,p}$	kN	14.07	21.99	29.41	52.28	75.40	108.57
Partial Safety Factor	g_{Mp}	-	1.80	1.80	1.80	1.80	1.80	1.80
Effective embedment Depth = STD	h_{ef}	mm	80	90	110	128	170	210
Characteristic Load	$N^0_{Rk,p}$	kN	14.07	19.79	26.95	41.82	64.09	95.00
Partial Safety Factor	g_{Mp}	-	1.80	1.80	1.80	1.80	1.80	1.80
Effective embedment Depth = 12d	h_{ef}	mm	96	120	144	192	240	288
Characteristic Load	$N^0_{Rk,p}$	kN	16.89	26.39	35.29	62.73	90.48	130.29
Partial Safety Factor	g_{Mp}	-	1.80	1.80	1.80	1.80	1.80	1.80

1. *Characteristic loads are valid for combined concrete cone and pullout failure as defined by TR029 only. All other failure modes, including steel failure, detailed in TR029 as well as including combined effects of tension and shear, must be considered in accordance with TR029.*
2. *Characteristic loads are valid for single anchors without close edge, anchor spacing or eccentric loading considerations.*
3. *Tabulated values are valid for temperature range -40 °C to +80 °C (Max LTT = +50 °C; Max STT = +80 °C).*
4. *Tabulated values are only valid for the installation conditions stated. Other conditions, such as different temperature ranges, may affect the performance of the product.*
5. *Long term temperatures are those that remain roughly constant over prolonged periods. Short term temperatures occur over brief intervals, eg: diurnal cycling.*
6. *The compressive strength of the concrete ($f_{ck,cube}$) is assumed to be 25 N/mm² for C20/25 concrete.*
7. *Tabulated values assume that the geometry of the anchor(s) and concrete member is sufficient to avoid splitting failure.*

THREADED RODS - CHARACTERISTIC VALUES FOR STEEL FAILURE						
Size	**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Steel Grade 4.6	15	23	34	63	98	141
Partial Safety Factor	2.00					
Steel Grade 5.8	18	29	42	79	123	177
Partial Safety Factor	1.50					
Steel Grade 8.8	29	46	67	126	196	282
Partial Safety Factor	1.50					
Steel Grade 10.9*	37	58	84	157	245	353
Partial Safety Factor	1.33					
Stainless Steel Grade A2-70, A4-70	26	41	59	110	172	247
Partial Safety Factor	1.87					
Stainless Steel Grade A4-80	29	46	67	126	196	282
Partial Safety Factor	1.60					
Stainless Steel Grade 1.4529	26	41	59	110	172	247
Partial Safety Factor	1.50					
Stainless Steel Grade 1.4565	26	41	59	110	172	247
Partial Safety Factor	1.87					
**Galvanized rods of high strength are sensitive to hydrogen induced brittle failure.*						

INSTALLATION PARAMETERS IN SOLID & HOLLOW MASONRY									
Anchor Type		**Anchor Rod**							
Size		**M8**	**M10**	**M12**	**M8**		**M10**		**M12**
Sieve Sleeve	l_s mm	-	-	-	85		85		85
	d_s mm	-	-	-	15	16	15	16	20
Nominal Drill Hole Diameter	d_o mm	15	15	20	15	16	15	16	20
Diameter of Cleaning Brush	d_b mm	$20^{\pm1}$	$20^{\pm1}$	$22^{\pm1}$	$20^{\pm1}$		$20^{\pm1}$		$22^{\pm1}$
Depth of the drill hole	h_o mm	90							
Effective anchorage depth	h_{ef} mm	85							
Diameter of clearance hole in the fixture	$d_f \leq$ mm	9	12	14	9		12		14
Torque moment	T_{inst} Nm	2							

EDGE DISTANCES AND SPACING									
Anchor rod									
Base Material	**M8**			**M10**			**M12**		
	$c_{cr} = c_{min}$	$s_{cr\,II} = s_{min\,II}$	$s_{cr}^{\perp} = s_{min}^{\perp}$	$c_{cr} = cm_{in}$	$s_{cr\,II} = s_{min\,II}$	$s_{cr}^{\perp} = s_{min}^{\perp}$	$c_{cr} = c_{min}$	$s_{cr\,II} = s_{min\,II}$	$s_{cr}^{\perp} = s_{min}^{\perp}$
	mm	mm	mm	mm	mm	mm	mm	mm	mm
Brick No 1	100	235	115	100	235	115	100	235	115
Brick No 2	128	255	255	128	255	255	128	255	255
Brick No 3	128	255	255	128	255	255	128	255	255
Brick No 4	100	250	240	100	250	240	100	250	240
Brick No 5	100	370	238	100	370	238	100	370	238
Brick No 6	100	245	110	100	245	110	100	245	110
Brick No 7	100	373	238	100	373	238	100	373	238

CHARACTERISTIC RESISTANCE UNDER TENSION AND SHEAR LOADING			
Base Material	**Anchor Rods $N_{Rk} = V_{Rk}$ [kN] [1)]**		
	M8	**M10**	**M12**
Brick No 1	2.0	2.0	2.0
Brick No 2	1.2	1.5	2.5
Brick No 3	0.5	0.75	1.2
Brick No 4	0.6	0.75	0.75
Brick No 5	1.2	1.2	2.0
Brick No 6	0.5	0.5	0.5
Brick No 7	1.2	1.2	1.5

1) For design according TR 054: $N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,s}$; $N_{Rk,pb}$ according to TR 054

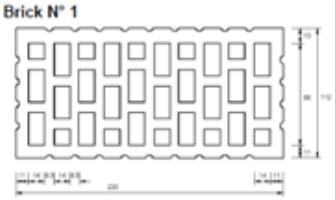
For $V_{Rk,s}$ see Annex C1, Table C2; Calculation of $V_{Rk,pb}$ and $V_{Rk,c}$ according to TR 054

CHARACTERISTIC BENDING MOMENT					
Steel Grade			**Anchor Diameter**		
			M8	**M10**	**M12**
Steel Grade 5.8	MRk,s	(N.m)	19	37	66
Steel Grade 8.8	MRk,s	(N.m)	30	60	105
Steel Grade 10.9*	MRk,s	(N.m)	37	75	131
Stainless Steel A2-70, A4-70	MRk,s	(N.m)	26	52	92
Stainless Steel A4-80	MRk,s	(N.m)	30	60	105
Stainless Steel 1.4529 strength class 70	MRk,s	(N.m)	26	52	92
Stainless Steel 1.4565 strength class 70	MRk,s	(N.m)	26	52	92

DISPLACEMENTS UNDER TENSION AND SHEAR LOAD					
Base Material	**F (kN)**	**δN0 [mm]**	**δN∞ [mm]**	**δV0 [mm]**	**δV∞ [mm]**
Solid Bricks	NRk / (1,4 γM)	0.6	**1.2**	**1.0**	**1.5**
Perforated & hollow bricks		0.14	0.28	1.0	1.5

ß- FACTORS FOR JOB SITE TESTS ACCORDING TO TR 053							
Brick No.	**No 1**	**No 2**	**No 3**	**No 4**	**No 5**	**No 6**	**No 7**
ß- factor	0.62	0.48	0.26	0.43	0.60	0.65	0.65

Brick N° 1



Hollow clay brick HLz 12-1,0-2DF
according to EN 771-1
length/width/height = 235 mm/112 mm/115 mm
$f_b \geq 12$ N/mm² / $\rho \geq 1,0$ kg/dm³

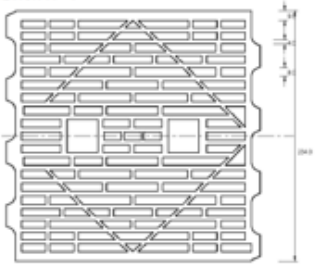
Brick N° 2

Solid clay brick Mz 12-2,0-NF
according to EN 771-1
length/width/height = 240 mm/116 mm/71 mm
$f_b \geq 12$ N/mm² / $\rho \geq 2,0$ kg/dm³

Brick N° 3

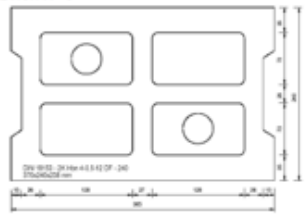
Solid sand lime brick KS 12-2,0-NF
according to EN 771-2
length/width/height = 240 mm/115 mm/70 mm
$f_b \geq 12$ N/mm² / $\rho \geq 2,0$ kg/dm³

Brick N° 4



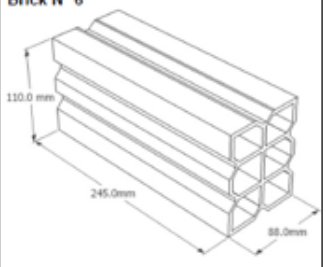
Hollow clay brick HLzW 6-0,7-8DF
according to EN 771-1
length/width/height = 250 mm/240 mm/240 mm
$f_b \geq 6$ N/mm² / $\rho \geq 0,8$ kg/dm³

Brick N° 5



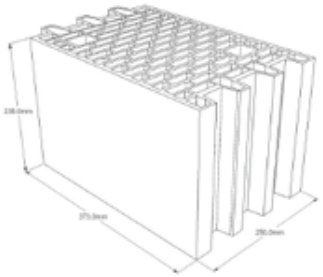
Concrete masonry unit Hbn 4-12DF
according to EN 771-3
length/width/height = 370 mm/240 mm/238 mm
$f_b \geq 4$ N/mm² / $\rho \geq 1,2$ kg/dm³

Brick N° 6



Hollow clay brick Hueco Doble
according to EN 771-1
length/width/height = 245 mm/110 mm/88 mm
$f_b \geq 2,5$ N/mm² / $\rho \geq 0,74$ kg/dm³

Brick N° 7



Hollow clay brick Porotherm 25 P+W KL15
according to EN 771-1
length/width/height = 373 mm/250 mm/238 mm
$f_b \geq 12$ N/mm² / $\rho \geq 0,9$ kg/dm³

CLEANING

Clean tools immediately after use, before material has set with **abe® super brush cleaner**, followed by washing with soap and water. The cured product can only be removed mechanically.

CAUTION

- Causes serious eye irritation.
- Causes skin irritation.
- May cause an allergic skin reaction.
- Wash the skin thoroughly after handling.
- Wear protective gloves and protective clothing, eye protection and face protection.
- IF ON SKIN: Wash with plenty of soap and water.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing and seek medical advice.
- If skin irritation occurs: Get medical advice / attention.
- Take off contaminated clothing and wash before reuse.
- Contains: Benzoyl peroxide.
- Keep out of reach of children.

VOLUME/SIZE

300 ml

COLOUR

Grey

HANDLING & STORAGE

abe® chemical anchor GP has a shelf life of 18 months from production date if kept in the original container in a cool, dry place (temperature < 25 °C). In more extreme conditions this period might be shortened.

HEALTH & SAFETY

Product safety information required for safe use is not included. Before handling, read product and safety data sheets and container labels for safe use, physical and health hazard information. The safety data sheet is available from your local **a.b.e.® Construction Chemicals** sales representative.

IMPORTANT NOTE

This data sheet is issued as a guide to the use of the product(s) concerned. Whilst **a.b.e.® Construction Chemicals** endeavors to ensure that any advice, recommendation, specification or information is accurate and correct, the company cannot – because **a.b.e.®** has no direct or continuous control over where and how **a.b.e.®** products are applied – accept any liability either directly or indirectly arising from the use of **a.b.e.®** products, whether or not in accordance with any advice, specification, recommendation, or information given by the company.

FURTHER INFORMATION

Where other products are to be used in conjunction with this material, the relevant technical data sheets should be consulted to determine total requirements. **a.b.e.® Construction Chemicals** has a wealth of technical and practical experience built up over years in the company's pursuit of excellence in flooring and concrete technology.

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a.b.e.® is an ISO 9001:2015 registered company
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