



# Arctic Styrene Free Resin



## Product Description

Chemfix Arctic is a rapid curing, one shot, two part chemical anchoring system based on a low odour resin. Specially developed using a high reactivity resin enabling it to be used at temperatures below -18°C. The resin has a lower viscosity than standard resins allowing it to be extruded in low temperature applications.

## Key Features

- Suitable for Very Low Temperature.
- Can be Extruded if the **Cartridge** Temperature is below -18°C.
- Medium & Heavy Duty Load Applications.
- High Durability.
- Ideal for Cold Room Usage.
- For Use in Wet Holes & Underwater.

## Approvals



INSTYTUT TECHNIKI  
BUDOWLANEJ  
Aprobacie Technicznej  
ITB nr AT-15-6835:2011  
ITB-974/W

Tested by:

**Imperial College  
London**  
Consultants

## Available Sizes

380ml / 400ml / 410ml 10:1 Co-axial Cartridge  
825ml 10:1 Side by Side Cartridge  
330ml / 345ml / 350ml 10:1 Side by Side Cartridge  
150ml/165ml/280ml/300/380/400/410ml Foil Bag

**IMPORTANT NOTE:** Performance based on clean holes; HAMMER DRILLED - blown and then brushed with a stiff metal brush & blown again.

## Typical Gel and Curing Time\*

\*Figures are based on M12 fixings. Full cure is achieved after 24 hours. All specifications are based on use of a Chemfix T-Flow™ Mixer.

BASE MATERIAL TEMPERATURE (°C)	35	25	15	5	-5**	-10**
TYPICAL GEL TIME (mins)	3	6	8	18	50	60
MIN. LOAD TIME (mins)	20	20	20	30	90	180

\*\*Resin temperature must be at least 20°C

## Typical Tensile (kN) Performance Data at Standard Embedment Depth

Size	5.8 Grade Steel Studding			A4-70 Grade Steel Studding			High Bond Reinforcing bars fyk=500N/mm <sup>2</sup>				
	Characteristic Resistance (N <sub>rk</sub> )	Design Resistance (N <sub>rd</sub> )	Recommended Load (N <sub>rec</sub> )	Characteristic Resistance (N <sub>rk</sub> )	Design Resistance (N <sub>rd</sub> )	Recommended Load (N <sub>rec</sub> )	Rebar Size (mm)	h <sub>nom</sub> (mm)	Steel Yield Load	Design Bond Load	Recommended Load
M8	19.0	12.7	9.1	25.6	12.9	9.2	8	80	21.9	11.7	8.3
M10	30.2	16.0	11.4	34.6	16.0	11.4	10	90	34.1	14.9	10.6
M12	43.8	20.3	14.5	43.8	20.7	14.8	12	110	49.2	18.8	13.4
M16	63.5	29.4	21.0	63.5	29.4	21.0	14	125	66.9	23.9	17.1
M20	97.6	38.7	27.6	97.6	38.7	27.6	16	125	87.4	26.2	18.7
M24	126.7	50.3	35.9	126.7	50.3	35.9	20	170	136.6	36.6	26.1
M30	179.5	71.2	50.9	179.5	71.2	50.9	25	210	213.4	48.8	34.9
							32	300	349.7	75.3	53.8
							40	360	546.3	99.5	71.1

## Typical Ultimate Physical Properties

	N/mm <sup>2</sup>	TEST METHOD	STORAGE / SHELF LIFE	IMPORTANT
COMPRESSIVE STRENGTH	50.31	(EN ISO 604) / (ASTM 695)	For longer term storage this product should be stored between +5°C & +25°C.  The Shelf life of the product is 12 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 Chemfix Products 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.
FLEXURAL STRENGTH	19.64	(EN ISO 178) / (ASTM 795)		
FLEXURAL MODULUS	2135.33	"		
TENSILE STRENGTH	10.66	(EN ISO 527) / (ASTM 638)		
E MODULUS	4263.33	"		



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## Performance Data for Various Stud Strengths, Material and Rebar

Concrete Strength Class: C20/25 (25N/mm<sup>2</sup> Cylinder; 30N/mm<sup>2</sup> 150mm cube).

### 5.8 Grade Studding

Stud Diameter (mm)	Hole Diameter (mm)	Design Resistance ( $N_{rd}$ )																		Fd,s					
		(kN)																		hef failure (mm)	design load (kN)				
8	10	12.7																		78	12.7				
10	12		16.0	17.8	19.6	20.1														=	Steel Failure	113	20.1		
12	14				20.3	22.1	24.0	25.8	27.7	29.2												159	29.2		
16	18					27.0	29.3	31.5	33.8	36.0	38.3	40.5	42.8	45.0	49.5	54.1	54.4						242	54.4	
Depth (mm)		80	90	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	350					
20	24	38.9	41.2	43.5	45.7	50.3	54.9	59.5	64.0	68.6	80.1	84.9											371	84.9	
24	28				48.0	52.8	57.6	62.4	67.2	72.1	84.1	96.1	108.1	120.1	122.4									510	122.4
30	40								71.3	76.4	89.1	101.8	114.5	127.3	140.0	152.7	178.2	203.6	229.1	254.5			1096	278.9	
Depth (mm)		170	180	190	200	220	240	260	280	300	350	400	450	500	550	600	700	800	900	1000					

### 8.8 Grade Studding

Stud Diameter (mm)	Hole Diameter (mm)	Design Resistance ( $N_{rd}$ )																		Fd,s							
		(kN)																		hef failure (mm)	design load (kN)						
8	10	13.0	14.6	16.2	17.8	19.5														121	19.5						
10	12		16.0	17.8	19.6	21.3	23.1	24.9	26.7	28.5	30.2	30.9									=	Steel Failure	174	30.9			
12	14				20.3	22.1	24.0	25.8	27.7	29.5	31.3	33.2	35.0	36.9	40.6	44.2	45.0							244	45.0		
16	18					27.0	29.3	31.5	33.8	36.0	38.3	40.5	42.8	45.0	49.5	54.1	58.6	63.1	67.6	78.8			372	83.7			
Depth (mm)		80	90	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	350							
20	24	38.9	41.2	43.5	45.7	50.3	54.9	59.5	64.0	68.6	80.1	91.5	102.9	114.4	125.8	130.7								571	130.7		
24	28				48.0	52.8	57.6	62.4	67.2	72.1	84.1	96.1	108.1	120.1	132.1	144.1	168.1	188.3								784	188.3
30	40								71.3	76.4	89.1	101.8	114.5	127.3	140.0	152.7	178.2	203.6	229.1	254.5			1096	278.9			
Depth (mm)		170	180	190	200	220	240	260	280	300	350	400	450	500	550	600	700	800	900	1000							

### 10.9 Grade Studding

Stud Diameter (mm)	Hole Diameter (mm)	Design Resistance ( $N_{rd}$ )																		Fd,s							
		(kN)																		hef failure (mm)	design load (kN)						
8	10	13.0	14.6	16.2	17.8	19.4	21.0	22.7	24.3	25.9	27.2									=	Steel Failure	168	27.2				
10	12		16.0	17.8	19.6	21.3	23.1	24.9	26.7	28.5	30.2	32.0	33.8	35.6	39.1	43.1								242	43.1		
12	14				20.3	22.1	24.0	25.8	27.7	29.5	31.3	33.2	35.0	36.9	40.6	44.2	47.9	51.6	55.3	62.6			340	62.6			
16	18					27.0	29.3	31.5	33.8	36.0	38.3	40.5	42.8	45.0	49.5	54.1	58.6	63.1	67.6	78.8			518	116.6			
Depth (mm)		80	90	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	350							
20	24	38.9	41.2	43.5	45.7	50.3	54.9	59.5	64.0	68.6	80.1	91.5	102.9	114.4	125.8	137.2	160.1	182.0								796	182.0
24	28				48.0	52.8	57.6	62.4	67.2	72.1	84.1	96.1	108.1	120.1	132.1	144.1	168.1	192.1	216.2	240.2			1092	262.2			
30	40								71.3	76.4	89.1	101.8	114.5	127.3	140.0	152.7	178.2	203.6	229.1	254.5			1527	388.5			
Depth (mm)		170	180	190	200	220	240	260	280	300	350	400	450	500	550	600	700	800	900	1000							



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### A4-70 Stainless Steel Studding

Stud Diameter (mm)	Hole Diameter (mm)	Design Resistance ( $N_{rd}$ ) (kN)																		$F_{d,s}$			
																				hef failure (mm)	design load (kN)		
8	10	13.0	13.7																		85	13.7	
10	12		16.0	17.8	19.6	21.3	21.7													=	Steel Failure	122	21.7
12	14				20.3	22.1	24.0	25.8	27.7	29.5	31.3	31.6										171	31.6
16	18					27.0	29.3	31.5	33.8	36.0	38.3	40.5	42.8	45.0	49.5	54.1	58.8					261	58.8
Depth (mm)		80	90	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	350			
20	24	38.9	41.2	43.5	45.7	50.3	54.9	59.5	64.0	68.6	80.1	91.7										401	91.7
24	28				48.0	52.8	57.6	62.4	67.2	72.1	84.1	96.1	108.1	120.1	132.1							550	132.1
30	40								71.3	76.4	89.1	101.8	114.5	127.3	139.8							549	139.8
Depth (mm)		170	180	190	200	220	240	260	280	300	350	400	450	500	550	600	700	800	900	1000			

### A4-80 Stainless Steel Studding

Stud Diameter (mm)	Hole Diameter (mm)	Design Resistance ( $N_{rd}$ ) (kN)																		$F_{d,s}$			
																				hef failure (mm)	design load (kN)		
8	10	13.0	14.6	15.7																		97	15.7
10	12		16.0	17.8	19.6	21.3	23.1	24.8												=	Steel Failure	140	24.8
12	14				20.3	22.1	24.0	24.8	27.7	29.5	31.3	33.2	35.0	36.1								196	36.1
16	18					27.0	29.3	31.5	33.8	36.0	38.3	40.5	42.8	45.0	49.5	54.1	58.6	63.1	67.2			298	67.2
Depth (mm)		80	90	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	350			
20	24	38.9	41.2	43.5	45.7	50.3	54.9	59.5	64.0	68.5	80.1	91.5	102.9	104.8								458	104.8
24	28				48.0	52.8	57.6	62.4	67.2	72.1	84.1	96.1	108.1	120.1	132.1	144.1	151.0					629	151.0
30	40								71.3	76.4	89.1	101.8	114.5	127.3	140.0	152.7	187.2	203.6	223.7			879	223.7
Depth (mm)		170	180	190	200	220	240	260	280	300	350	400	450	500	550	600	700	800	900	1000			

### High Bond Reinforcing Bars $f_{yk}=500N/mm^2$

Rebar Diameter (mm)	Hole Diameter (mm)	Design Resistance ( $N_{rd}$ ) (kN)																		$F_{d,s}$			
																				hef failure (mm)	design load (kN)		
8	10-12	11.7	14.6	17.5	21.9																	150	21.9
10	12-14		16.7	20.0	23.3	26.6	30.0	34.1												=	Steel Failure	205	34.1
12	16-18			20.4	23.8	27.1	30.5	33.9	37.3	40.7	44.1	49.2										290	49.2
14	18-20				26.5	30.3	34.0	37.8	41.6	45.4	49.2	53.0	56.7	60.5	66.9							354	66.9
16	20-22					33.8	38.0	42.2	46.5	50.7	54.9	59.1	63.3	67.6	71.8	76.0	80.2	87.4				414	87.4
Depth (mm)		80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	450	500			
20	25 - 28	42.7	48.1	53.4	58.8	64.1	74.8	85.5	96.1	106.8	117.5	136.6										639	136.6
25	30 - 32			58.9	64.8	70.7	82.5	94.3	106.0	117.8	129.6	141.4	165.0	188.5	213.4							906	213.4
32	39 - 42					75.4	88.0	100.5	113.1	125.7	138.2	150.8	176.0	201.1	226.2	251.4	276.5	301.6	349.7			1391	349.7
40	48 - 52							110.6	124.4	138.2	152.1	165.9	193.5	221.2	248.8	276.5	304.1	331.8	359.4	381.7		1976	546.3
Depth (mm)		200	225	250	275	300	350	400	450	500	550	600	700	800	900	1000	1100	1200	1300	1400			



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## Characteristic (Vrk,s) & Design (Vrd,s) Shear Loads for Various Stud Grades + Rebar

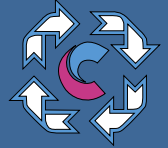
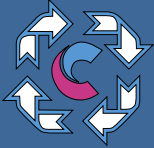
Stud Diameter	Stud Grade 5.8		Stud Grade 8.8		Stud Grade 10.9		Stud Grade A4-70		Stud Grade A4-80		Rebar Diameter (mm)	BSt 500 Rebar	
	Vrk,s (kN)	Vrd,s (kN)	Vrk,s (kN)	Vrd,s (kN)	Vrk,s (kN)	Vrd,s (kN)	Vrk,s (kN)	Vrd,s (kN)	Vrk,s (kN)	Vrd,s (kN)		Vrk,s (kN)	Vrd,s (kN)
M8	9.0	7.2	14.6	11.7	19.0	15.2	12.8	8.2	14.6	9.4	8	16.6	11.1
M10	15.0	12.0	23.2	18.6	30.2	24.1	20.3	13.0	23.2	14.9	10	25.9	17.3
M12	21.0	16.8	33.7	27.0	43.8	35.1	29.5	18.9	33.7	21.6	12	37.3	24.9
M16	39.0	31.2	62.8	50.2	81.6	65.3	55.0	32.5	62.8	40.3	14	50.8	33.9
M20	61.0	48.8	98.0	78.4	127.4	101.9	85.8	55.0	98.0	62.8	16	66.4	44.3
M24	88.0	70.4	141.2	113.0	183.6	146.8	123.6	79.2	141.2	90.5	20	103.9	69.3
M30	207.0	165.6	207.6	166.1	269.9	215.9	129.8	64.9	207.6	103.8	25	162.0	108.0
											32	265.1	176.7
											40	414.6	276.4

### Notes:

All grades shown for information. M30 studding is 8.8 grade instead of 5.8 grade. M30 for A4-70 tensile strength of 500N/mm<sup>2</sup>, instead of 700N/mm<sup>2</sup>. Safety Factor is 1.25 for all carbon steel. Safety Factor is 1.56 for stainless steel, up to M24, M30 is 2.0. Safety Factor is 1.5 for BSt 500 rebar.

## Typical Performance in Hollow Substrate

Size	Recommended Load (kN)	
	Brickwork 20.5 N/mm <sup>2</sup>	Blockwork 7 N/mm <sup>2</sup>
M8	1.7	0.8
M10	3.4	1.7
M12	4.8	2.7
M16	5.6	3.6



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## Reduction factors: Spacings and Edge Distances

Spacing Reduction Factor $f_s$								Edge Distance Reduction Factor $f_E$																					
Tensile Load / Shear Load								Tensile Load $f_{RN}$							Shear Load $f_{RV}$														
Spacing	$\varnothing$ Anchors / Rebar (mm)							Edge Distance (mm)	$\varnothing$ Anchors / Rebar (mm)																				
	8	10	12	16	20	24	30		8	10	12	16	20	24	30	8	10	12	16	20	24	30							
40	0.64							40	0.64							0.25													
50	0.67	0.63						50	0.73	0.63						0.44	0.30												
60	0.70	0.65	0.63					60	0.82	0.70	0.63					0.63	0.48	0.30											
70	0.73	0.68	0.64					70	0.90	0.77	0.68					0.81	0.65	0.44											
80	0.76	0.70	0.66	0.63				80	1.00	0.84	0.74	0.63				1.00	0.83	0.58	0.40										
90	0.79	0.73	0.68	0.64				90		0.91	0.80	0.67				1.00	0.72	0.53											
100	0.82	0.75	0.70	0.65	0.63			100		1.00	0.86	0.72	0.63				0.86	0.67	0.35										
125	0.89	0.81	0.75	0.69	0.66	0.63		110			0.92	0.77	0.66				1.00	0.80	0.44										
150	0.96	0.88	0.80	0.73	0.69	0.65	0.63	120			1.00	0.81	0.70	0.64				1.00	0.58	0.35									
160	1.00	0.90	0.82	0.74	0.70	0.66	0.64	140				0.91	0.78	0.67	0.63				0.72	0.46	0.30								
175		0.94	0.85	0.76	0.72	0.68	0.65	160				1.00	0.85	0.73	0.66				0.91	0.62	0.35								
200		1.00	0.90	0.80	0.75	0.70	0.68	180					0.93	0.80	0.72				1.00	0.77	0.46								
225			0.95	0.84	0.78	0.73	0.70	200					1.00	0.86	0.78					0.92	0.57								
240			1.00	0.86	0.80	0.75	0.72	220						0.92	0.84					1.00	0.68								
250				0.87	0.81	0.76	0.73	240						1.00	0.90						0.78								
275				0.91	0.84	0.78	0.75	265							1.00						1.00								
280				0.92	0.85	0.79	0.76																						
300				0.95	0.88	0.81	0.78																						
320				1.00	0.90	0.83	0.80																						
350					0.94	0.86	0.83																						
400					1.00	0.92	0.88																						
440						0.96	0.92																						
480						1.00	0.96																						
500							0.98																						
525							1.00																						

