

STAINLESS STEEL MASONRY FIXINGS



ETAX CE

A complete guide to our **ETA-approved**

A4 stainless steel masonry screws, designed for tunnels, infrastructure projects, and other demanding applications where durability and corrosion resistance are essential.

PRODUCT CODE **BOX QUANTITY A4HH** RANGE OF A4HH6.3-32-GP 100 SIZES AVAILABLE A4HH6.3-45-GP 100 A4HH6.3-57-GP 100 **CONTACT US BELOW FOR** A4HH6.3-70-GP 100 **MORE INFORMATION:** A4HH6 3-82-GP 100 TEL: +44 (0)141 647 7100 A4HH6.3-100-GP 100 FAX +44 (0)141 647 5100 A4HH6.3-125-GP 100 Email: sales@evofas.com Email: technical@evofas.com 100 A4HH6.3-140-GP A4HH6.3-160-GP 50 A4HH6.3-180-GP 50 Transportation and an arrangement of the second A4HH6.3-200-GP 50 A4HH6.3-225-GP 50 A4HH6.3-250-GP 50 A4HH8.0-275-GP 50 A4HH8.0-300-GP 50 A4HH8.0-350-GP 50

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INTRODUCTION.



KEY FEATURES.

Material Excellence

Manufactured from high-grade A4 stainless steel, these fixings offer exceptional corrosion resistance, making them ideal for demanding construction projects in marine, industrial, and high-exposure settings.

Their material properties provide protection against humidity, road salt, and airborne contaminants, ensuring long-term durability in even the toughest conditions.

ETA Certification

The A4HH range is ETA-approved, guaranteeing full compliance with European standards for quality, safety, and performance.

Versatile Applications

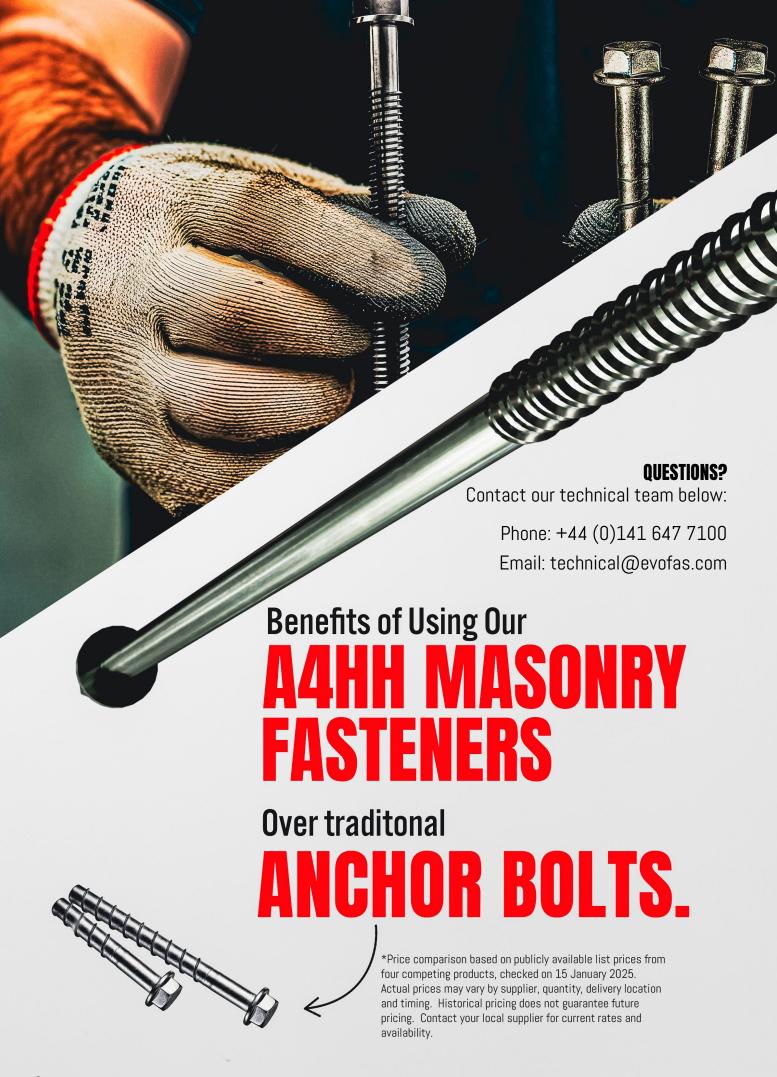
Designed for both indoor and outdoor applications, the A4HH range is built to withstand harsh environments, where exposure to moisture, pollutants, and corrosive elements is a constant challenge.

Precision Engineering

Tested to EAD 330011-00-0601, these fasteners achieve a tensile strength greater than 9.3 kN when installed in accordance with technical specifications. Suitable for use with concrete (minimum grade C20/25), structural steel (S235-S355), and timber (C24 grade and above) substrates when installed per ETA Number 22/0409.

Testing demonstrates successful application in infrastructure, industrial, and construction projects where installation guidelines are followed.

Reference our latest technical data sheet for complete substrate compatibility and installation requirements.





Save between 50-80% by choosing our A4 Masonry Range, over traditional anchor bolts. *

Immediate Load-Bearing Capacity

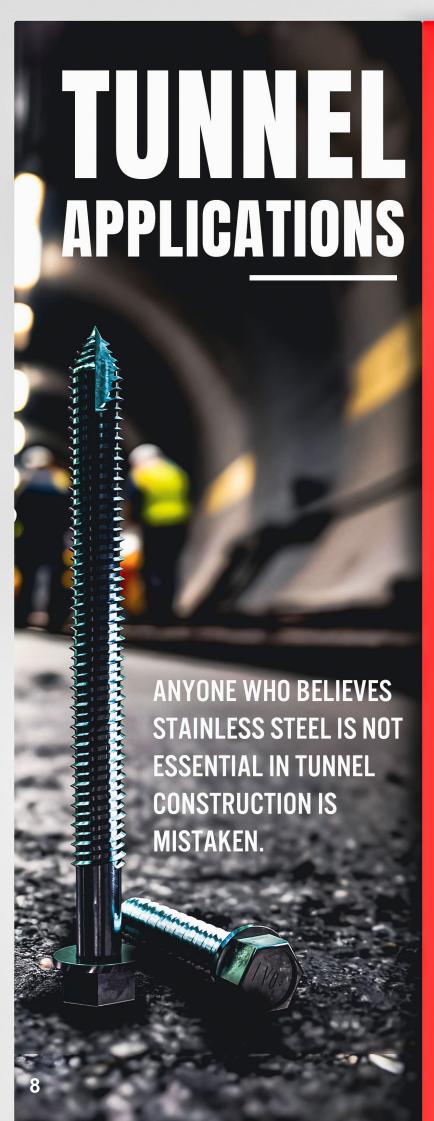
When compared to other traditional anchor solutions, such as resin-based anchors that require curing time to elapse: Evolution A4HH provide immediate load-bearing capacity upon installation.

Reduced stress on friable substrates

Unlike other traditional anchor solutions, such as shield anchors or through-bolts, Evolution A4HH exerts less outward pressures on the surrounding substrate material. This allows for the product to be installed relatively closer to the edges of the substrate while heavily mitigating against the risk of cracking or damaging the substrate.

Removability and recycling

Unlike resin anchors or through-bolts, Evolution A4HH can be easily removed from substrates they are installed into, which make them ideal for temporary holding duties (i.e., scaffolding, baseplates, etc). The added benefit of this is that screws are also easily removed for recycling (and are 100% recyclable).



WHY THE
A4HH RANGE
IS CRUCIAL FOR
TUNNEL
CONSTRUCTION

HUMIDITY:

THE HARBINGER OF CHEMICAL, BACTERIAL AND ELECTRO-GALVANIC ATTACK.

IN TUNNEL ENVIRONMENTS, VENTILATION AND CLIMATE CONTROL ARE NO SMALL ISSUE TO OVERCOME. EVEN SOME OF THE WORLD'S MOST EXPENSIVE AND BEST-DESIGNED TUNNELS STILL SUFFER FROM POOR VENTILATION, ACCORDING TO THE CROSSRAIL BEST PRACTICE GUIDE TO AIR QUALITY.

TUNNELS, BY THEIR NATURE, HAVE INCREDIBLY HIGH HUMIDITY, ELEVATED TEMPERATURE AND POOR AIR CIRCULATION. THIS TRIAD OF FOES BRING WITH IT AN

OMNIPRESENT SOURCE OF WATER TO COLLECT HYDROCARBONS, NITROUS OXIDE AND SUPLHUR DIOXIDE FROM EMISSIONS INSIDE THE TUNNELS WHICH

CHEMICALLY ATTACK FASTENERS, AS WELL AS PROVIDING A HOME TO BACTERIA WHICH CAN BE BOTH SULPHATE REDUCING AND IRON OXIDISING THROUGH THEIR METABOLIC PROCESSES.

THE FINAL PART OF THE TRIAD IS ACCELERATED ELECTROGALVANIC CORROSION FROM SALTS REMAINING IN THE WATER AND FORMING AN ELECTROLYTE THAT ALLOWS THE FREE-TRANSFER OF IONS BETWEEN THE FIXTURE, SUBSTRATE AND FASTENER MATERIALS.

PREVENTION OF STRUCTURAL FAILURES



USING LOWER-GRADE OR UNSUITABLE MATERIALS IN TUNNELS CAN LEAD TO SERIOUS STRUCTURAL FAILURES OVER TIME DUE TO CORROSION.

FASTENERS THAT DEGRADE CAN COMPROMISE TUNNEL LININGS, ELECTRICAL FIXINGS, AND SAFETY SYSTEMS.

BY SPECIFYING OUR A4HH RANGE ENGINEERS
REDUCE THE RISK OF FAILURE, ENSURING
THE STRUCTURAL INTEGRITY OF TUNNELS
AND THE SAFETY OF WORKERS AND THE PUBLIC.

CORROSION RESISTANCE CLASSIFICATION



EUROPEAN STANDARD AND INTERNATIONAL STANDARD EN ISO 12944-2 DEFINES CORROSIVITY CATEGORIES FOR CONSTRUCTION APPLICATIONS BASED ON EMPIRICAL AND QUALITATIVE STUDIES.

THE EVOLUTION A4HH RANGE ACHIEVES RESISTANCE REQUIRED FOR C4 CATEGORY APPLICATIONS WHEN TESTED TO EN ISO 9227.

THUS, THE FASTENERS ARE DEMONSTRATED TO HAVE EXCEPTIONAL CORROSION RESISTANCE IN APPLICATIONS WITH EXPOSURE TO MOISTURE, ROAD SALTS AND POLLUTANTS.





FENCING AND GATES ARE CONSTANTLY EXPOSED TO THE ELEMENTS

RAIN, WIND, TEMPERATURE CHANGES, AND EVEN SALT SPRAY IN COASTAL AREAS, CAN CAUSE STANDARD FIXINGS TO CORRODE OVER TIME, LEADING TO INSTABILITY, LOOSENING, AND ULTIMATELY, FAILURE. THE A4HH MASONRY SCREW, MADE FROM A4 (316) STAINLESS STEEL, IS DESIGNED TO RESIST RUST, CORROSION, AND WEATHERING, ENSURING A LONG-LASTING AND MAINTENANCE-FREE FIXING SOLUTION.

OUR A4HH RANGE IS IDEAL FOR FIXING

FENCING AND GATE POSTS SECURELY

PUBLIC INFRASTRUCTURE:



THESE SCREWS ARE SUITABLE FOR SECURING FENCING AND BARRIERS IN PUBLIC SPACES, SUCH AS PARKS AND TRANSPORTATION HUBS, WHERE RELIABILITY AND SAFETY ARE PARAMOUNT.

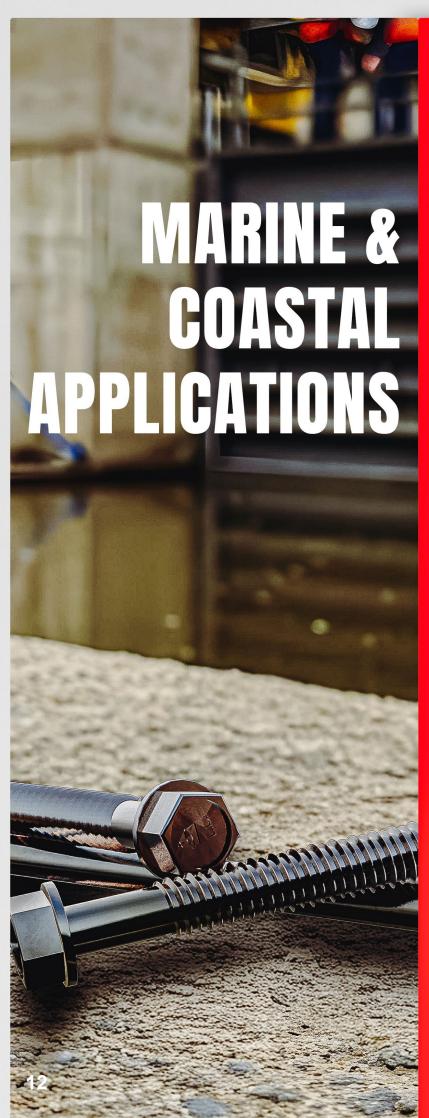
STADIUM PERIMETERS:



IN LARGE VENUES LIKE FOOTBALL STADIUMS, STAINLESS STEEL MASONRY SCREWS ARE USED TO INSTALL PERIMETER FENCING, PROVIDING SECURITY AND CROWD CONTROL.

THEIR DURABILITY ENSURES LONG-LASTING PERFORMANCE IN HIGH-TRAFFIC AREAS, IN ADDITION TO THE MAIN APPLICATION OF FIXING DUCTS, CABLE TRAYS AND FLASHING.





COASTAL CONSTRUCTION PROJECTS, SUCH AS SEAWALLS, PIERS, JETTIES, AND HARBOURS, REQUIRE FASTENING SOLUTIONS THAT CAN WITHSTAND CONTINUOUS EXPOSURE TO EXTREME ENVIRONMENTAL CONDITIONS.



THE IDEAL CHOICE AGAINST



CORROSION CATEGORIES.

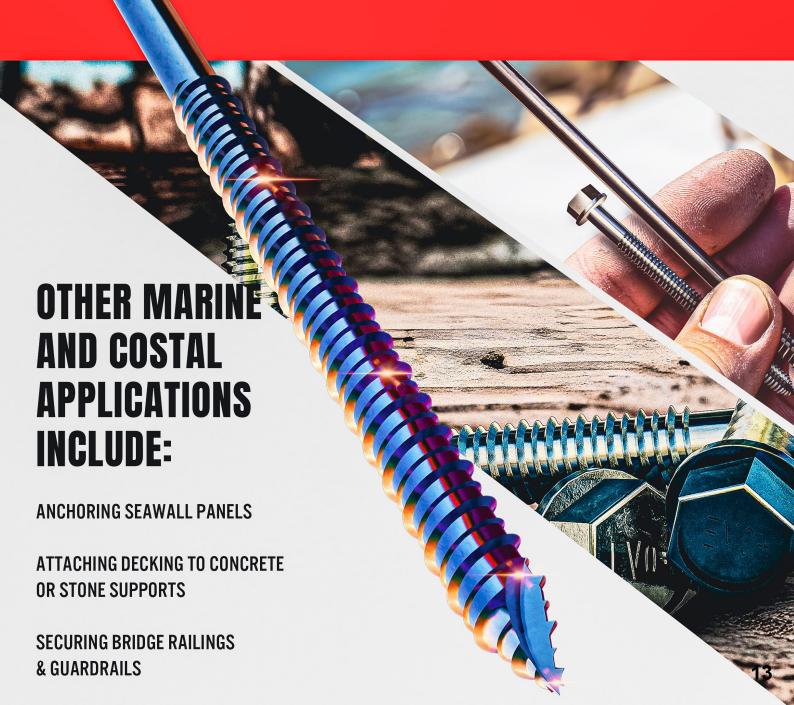
A4 STAINLESS STEEL (316-GRADE EQUIVALENT)

SIGNIFICANTLY OUTPERFORMS A2
STAINLESS STEEL (304-GRADE) IN
TERMS OF PITTING AND CREVICE
CORROSION RESISTANCE. THIS MAKES
A4HH FIXINGS AN EXCELLENT CHOICE
FOR ENVIRONMENTS WHERE
PROLONGED EXPOSURE TO SALTWATER
AND FLUCTUATING TEMPERATURES CAN
COMPROMISE THE INTEGRITY OF
LOWER-GRADE MATERIALS.

OPTIMISED FOR SLUICE GATE & LOCK GATE INSTALLATIONS

SLUICE GATES AND LOCK GATES ARE CONSTANTLY EXPOSED TO WATER, PRESSURE VARIATIONS, AND ABRASIVE CONDITIONS.

THE CHOICE OF FASTENERS IN
THESE APPLICATIONS IS CRUCIAL
FOR MAINTAINING THE
STRUCTURAL INTEGRITY OF THE
GATES AND ENSURING THEIR
LONG-TERM FUNCTIONALITY.



4. CLADDING & BRACKETRY INSTALLATION

HELPING-HAND BRACKETS

TRADITIONAL FIXING METHODS INVOLVE SECURING THE PAD/PACKER END OF THE HELPING-HAND BRACKET TO CONCRETE USING A THROUGH-BOLT, WHICH REQUIRES PRECISE DRILLING AND CAN LEAD TO EXCESSIVE STRESS ON THE SUBSTRATE. BY USING A4HH STAINLESS STEEL MASONRY SCREWS INSTEAD, INSTALLERS BENEFIT FROM:

FASTER INSTALLATION

REDUCED STRESS ON MASONRY

ENHANCED CORROSION RESISTANCE

FURTHER APPLICATIONS:



RAIL-RUNNERS / TOP-HAT RAILS:

RAIL SYSTEMS MUST BE FIRMLY SECURED TO MASONRY TO SUPPORT CLADDING PANELS AND MAINTAIN ALIGNMENT OVER TIME. A4HH MASONRY SCREWS PROVIDE, SECURE ANCHORAGE AND EASE OF ADJUSTMENT.

ANGLE-BRACKETS:

ANGLE-BRACKETS ARE USED TO CREATE STRUCTURAL CONNECTIONS BETWEEN MASONRY WALLS AND SECONDARY FRAMEWORK. MAKING THE A4HH A RELIABLE ALTERNATIVE TO EXPANSION ANCHORS.

PADS & PACKERS:

ESSENTIAL FOR LEVELLING AND SPACING CLADDING SUPPORT STRUCTURES.



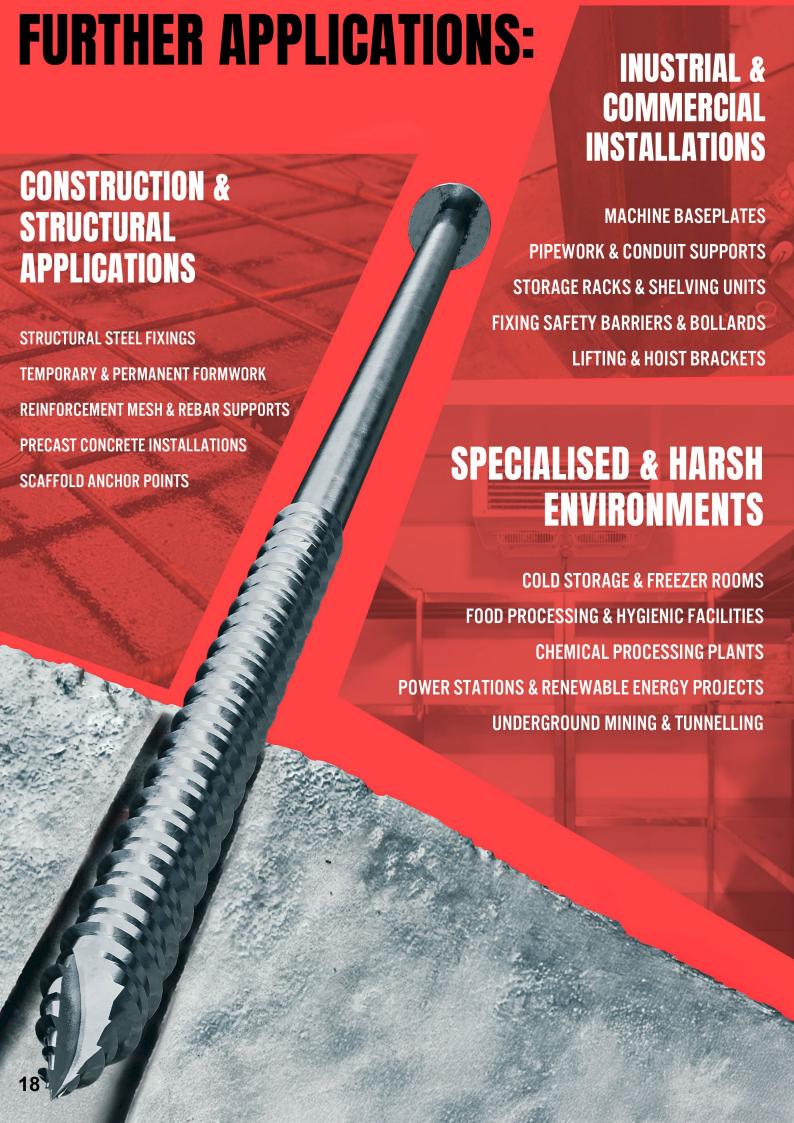
RAIL HANGERS AND OTHER SUSPENSION COMPONENTS MUST WITHSTAND BOTH STATIC AND DYNAMIC FORCES.











TABLES FROM THE ANNEXES OF THE EUROPEAN TECHNICAL ASSESSMENT:



TABLE 1: Characteristic resistances under tension loads in case of static and quasi-static loading for design according to EN 1992-4:2018

EVO (EVO+)				Anchor size				
				EVO (EVO+)				
			5-1			5-2		
STEEL FAILURE								
Anchor size	NRk	Nrk,s [kN]			9,3			
EVO (EVO+)	'Үм	'YMs 1) [-]]	1,4			
PULL-OUT FAILURE								
Characteristic resistance in cracked and non-cracked concrete C20/25		N	I _{Rk,p}	[k	N]	1,2		2,0
				C25	5/30	1, 12		1,10
				C30)/37	1,22		1,18
Increasing factor for N _{Rk,p}		Ψ _c		C35	5/45	1,32		1,26
				C40)/50	1,41		1,33
				C45	5/55	1,50		1,40
			C)/60	1,58		1,46
B 21 4 4 4 4		'Yinst [-] 1.0)		
Partial safety facto	ı	"\	/ Mp ¹⁾	[-]		1,5 ²)		
Concrete cone and splitting	failure							
Effective anchorage depth	h _{ef}		[mm]		19,2		27,7	
Factor for cracked concrete		k _{cr}		[-	-]	7,7		
Factor for non-cracked concrete		k ucr		[-	-]	11,0		,0
Spacing		S _{Cr,N}		[mm]		58		83
Edge distance		C _{cr,N}		[m	ım]	29		42
Spacing (splitting)		S _{cr,sp}		[m	ım]	90		84
Edge distance (splitting)		C _{cr,sp}		[m	ım]	45		63
Partial safety factor 'YMsp² [-] 1,5²)					j ²⁾			

¹⁾ In absence of other national regulations

²⁾ The installation safety factor of 'Y_{inst} = 1,0 is included

evolution

TABLE 2: Characteristic resistances under shear loads in case of static and quasi-static loading or design according to EN 1992-4:2018

	Anchor size					
EVO (EVO+)			EVO (EVO+)			
	5-1	5-2				
STEEL FAILURE WITHOUT LEVER ARM						
Characteristic resistance	V Rk,s	[kN]	7,9			
Partial safety factor	'YMs 1)	[-]	1,25			
Factor for considering ductility	k ₇	[-]	1,0			
STEEL FAILURE WITH LEVER ARM						
Characteristic resistance	M ⁰ Rk,s	[Nm]	6,2			
Partial safety factor	'Y Ms ¹⁾	[-]	1,25			
CONCRETE PRYOUT FAILURE						
k-factor	k ₈	[-]	1,0			
Partial safety factor	'Y Mc ¹⁾	[-]	1,25			
CONCRETE EDGE FAILURE						
Effective length of anchor under shear load	l _f	mm	19,2	27,7		
Outside diameter of anchor	d _{nom}	mm	8			
Partial safety factor	'Үм с ¹⁾	[-]	1,5			

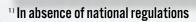




TABLE 3:Characteristic resistances under tension loads in case of fire exposure for design according to EN 1992-4:2018

	Anchor size					
EVO (EVO+)			EVO (EVO+)			
	5-1	5-2				
STEEL FAILURE						
Characteristic resistance N _{Rk,s,fi}	R30	[kN]	0,16			
	R60	[kN]	0,14			
	R90	[kN]	0,11			
	R120	[kN]	0,08			
PULL-OUT FAILURE						
	R30	[kN]	0,30	0,50		
Characteristic	R60	[kN]	0,30	0,50		
resistance N _{Rk,p,fi}	R90	[kN]	0,30	0,50		
	R120	[kN]	0,24	0,40		
CONCRETE CONE AND SPLITTING FAILURE 1)						
	R30	[kN]	0,28	0,70		
Characteristic resistance N _{Rk,c,fi}	R60	[kN]	0,28	0,70		
	R90	[kN]	0,28	0,70		
	R120	[kN]	0,22	0,56		
Spacing	S _{cr,N,fi}	[mm]	4 X h _{ef}			
	S _{min}	[mm]	35	35		
Edge Distance	C _{cr,N,fi}	[mm]	2 X h _{ef}			
	C _{min}	[mm]	Fire attack from one side: C _{min} = 2 X h _{ef}			
			Fire attack from more than one side: Cmin 2> 300 mm and 2>2 x bef			

¹⁾ As a rule, splitting failure can be neglected when cracked concrete and reinforcement is assumed Design under fire exposure is performed according to the design method given in EN 1992-4.

Under fire exposure usually cracked concrete is assumed. The design equations are given in EN 1992-4. In the absence of other national regulations the partial safety factor for resistance under fire exposure YM,fi = 1,0 is recommended.

TABLE 4 :Characteristic resistances under shear loads in case of fire exposure for design according to EN 1992-4:2018

EVO (EVO+)			Anchor size EVO (EVO+)			
			5-1	5-1		
STEEL FAILURE WITHOUT LEVER ARM						
Characteristic	R30	[kN]	0,16			
	R60	[kN]	0,14			
resistance $N_{\scriptscriptstyle Rk,s,fi}$	R90	[kN]	0,11			
	R120	[kN]	0,08			
STEEL FAILURE WITH LEVER ARM						
	R30	[Nm]	0,10			
Characteristic	R60	[Nm]	0,09			
resistance $N_{\scriptscriptstyle Rk,s,fi}$	R90	[Nm]	0,07			
	R120	[Nm]	0,05			
CONCRETE PRYOUT FAILURE						
K-FACTOR	K ₈	[-]	1,0			
	R30	[Nm]	0,10			
Characteristic	R60	[Nm]	0,09			
resistance $oldsymbol{V}_{\scriptscriptstyle Rk,cp,fi}$	R90	[Nm]	0,07			
	R120	[Nm]	0,05			
CONCRETE EDGE FAILURE						
The initial value v^0 Rk,c,fi of the characteristic resistance in concrete C20/25 to C50/60 under fire exposure may be determined by: $v^0_{Rk,c,fi} = 0.25 \text{ X } v^0_{Rk,c} \text{ (S R90)} \qquad v^0_{Rk,c,fi} = 0.25 \text{ X } v^0_{Rk,c} \text{ (R120)}$ with $v^0_{Rk,c}$ initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature						

Under fire exposure usually cracked concrete is assumed. The design equations are given in EN 1992-4.

EN 1992-4 covers design for fire exposure from one side. For fire attack from more than one side the edge distance must be increased to $C_{min} > 300 \text{ mm}$ and > 2 x hef.

In the absence of other national regulations the partial safety factor for resistance under fire exposure YM,fi = 1,0 is recommended.







ENTERPRISE SYSTEM TO

FOR BRICK-TIE CHANNES

A high-performance solution for securely tying brickwork to concrete or steel frames, ensuring structural stability and long-term durability. Designed for modern construction, this system provides flexibility, ease of installation, and exceptional strength, making it ideal for a wide range of applications.

GOLDEN THREAD READY. ®

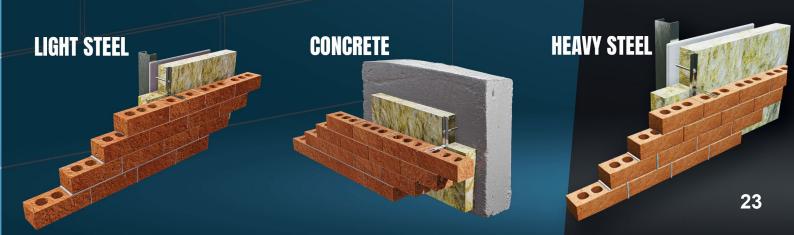
www.enterprisesystem.co.uk

60 YEAR WARRANTY.

PROJECT-SPECIFIC TEST

How it works:

The Enterprise Brick Tie Channel System is designed to create a secure and adjustable fixing between brickwork and structural elements, such as concrete frames or light/heavy gauge steel. The system consists of channel, stainless steel fasteners, and adjustable brick ties, which are inserted at the required positions, allowing for flexibility and movement while maintaining structural stability.

















HOW TO ORDER

Contact Evolution Fasteners to learn more about the A4HH range or to place an order. Our dedicated team is ready to assist you with product selection, technical support, and logistics to meet your project requirements.

Website: www.evofas.com

Phone: +44 (0)141 647 7100

