evolution

www.evofas.com

STAINLESS STEEL MASONRY FIXINGS

ETA 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.

A4HH RANGE OF SIZES AVAILABLE

PRODUCT CODE	BOX QUANTITY
A4HH6.3-32-GP	100
A4HH6.3-45-GP	100
A4HH6.3-57-GP	100
A4HH6.3-70-GP	100
A4HH6.3-82-GP	100
A4HH6.3-100-GP	100
A4HH6.3-125-GP	100
A4HH6.3-140-GP	100
A4HH6.3-160-GP	50
A4HH6.3-180-GP	50
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

CONTACT US BELOW FOR MORE INFORMATION:

TEL: +44 (0)141 647 7100
FAX +44 (0)141 647 5100

Email: sales@evofas.com
Email: technical@evofas.com

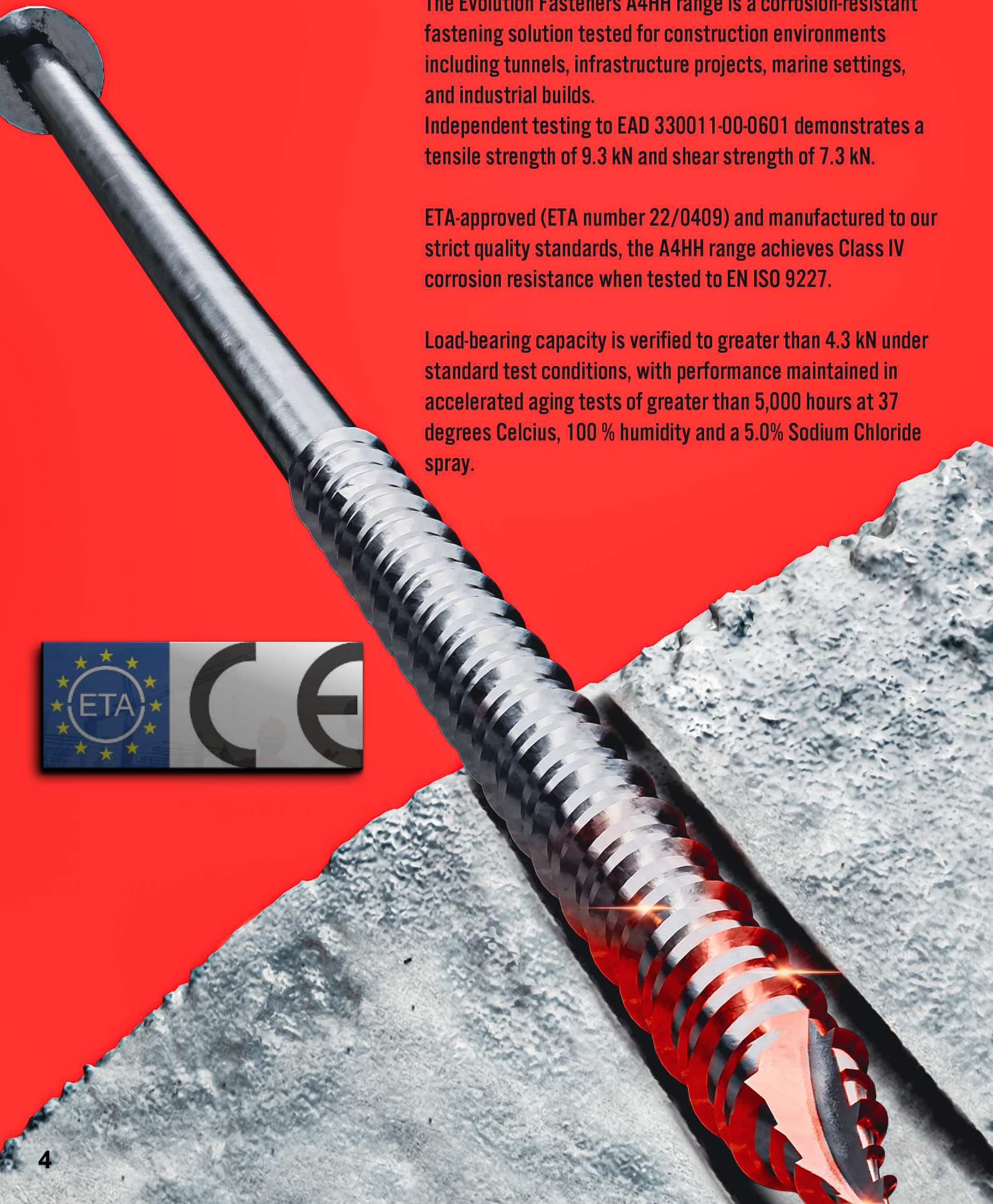
CONTENTS

INTRODUCTION.

The Evolution Fasteners A4HH range is a corrosion-resistant fastening solution tested for construction environments including tunnels, infrastructure projects, marine settings, and industrial builds.
Independent testing to EAD 330011-00-0601 demonstrates a tensile strength of 9.3 kN and shear strength of 7.3 kN.

ETA-approved (ETA number 22/0409) and manufactured to our strict quality standards, the A4HH range achieves Class IV corrosion resistance when tested to EN ISO 9227.

Load-bearing capacity is verified to greater than 4.3 kN under standard test conditions, with performance maintained in accelerated aging tests of greater than 5,000 hours at 37 degrees Celcius, 100 % humidity and a 5.0% Sodium Chloride spray.



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.

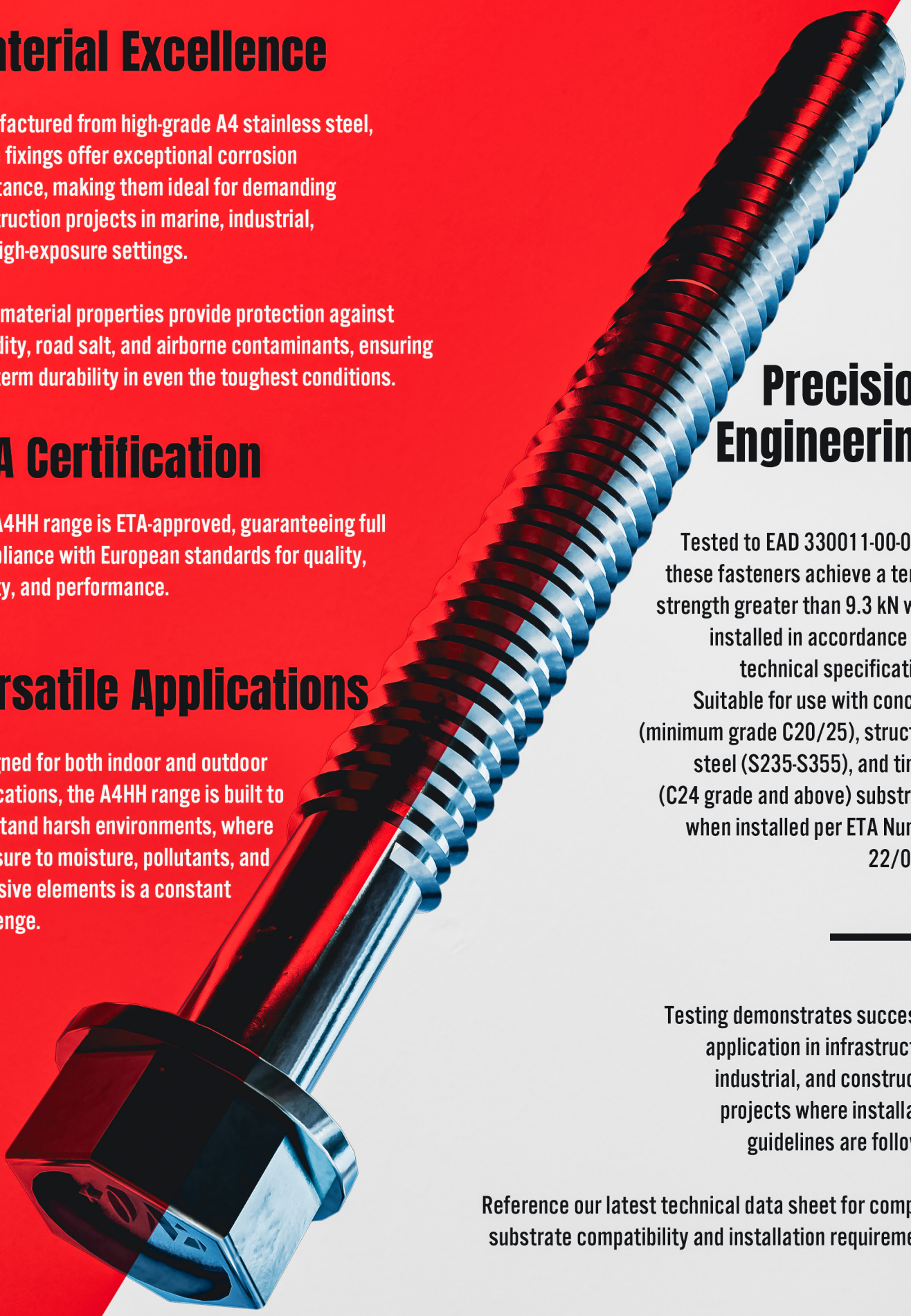
Their material properties provide protection against humidity, road salt, and airborne contaminants, ensuring long-term durability in even the toughest conditions.

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.

QUESTIONS?
Contact our technical team below:

Phone: +44 (0)141 647 7100

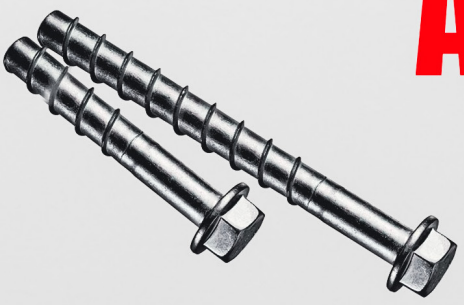
Email: technical@evofas.com

Benefits of Using Our

A4HH MASONRY FASTENERS

Over traditonal

ANCHOR BOLTS.



*Price comparison based on publicly available list prices from four competing products, checked on 15 January 2025. Actual prices may vary by supplier, quantity, delivery location and timing. Historical pricing does not guarantee future pricing. Contact your local supplier for current rates and availability.

Cost-Effective Alternative

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).

TUNNEL APPLICATIONS

ANYONE WHO BELIEVES STAINLESS STEEL IS NOT ESSENTIAL IN TUNNEL CONSTRUCTION IS MISTAKEN.

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.

RESIDENTIAL & OUTDOOR APPLICATIONS

WHEN IT COMES TO OUTDOOR STRUCTURES, DURABILITY AND RELIABILITY ARE ESSENTIAL.

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.

QUESTIONS?

Contact our technical team below:

Phone: +44 (0)141 647 7100

Email: technical@evofas.com

MARINE & COASTAL APPLICATIONS

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

A4

STAINLESS STEEL.

THE IDEAL CHOICE

AGAINST

C4

CORROSION CATEGORIES.

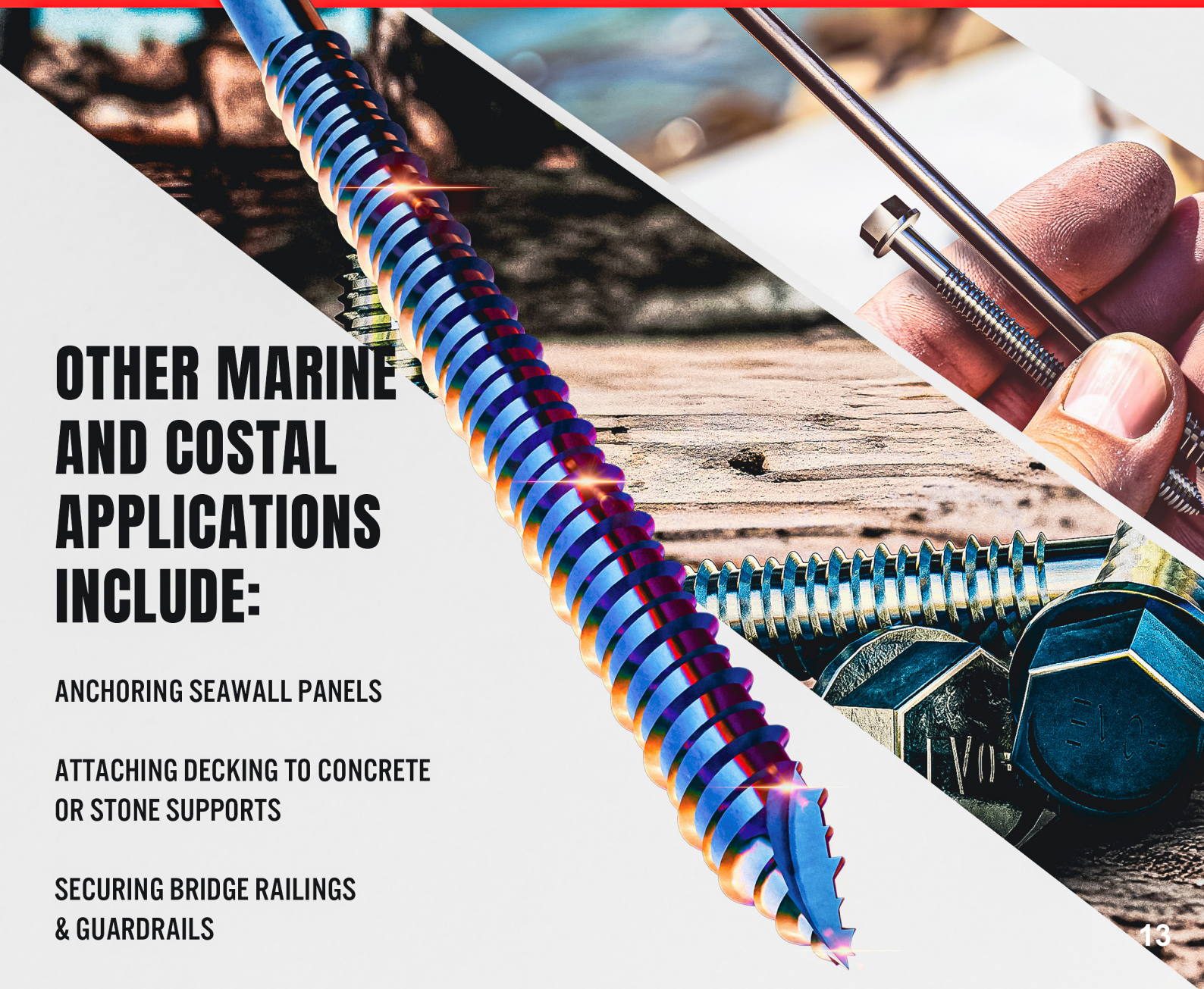
A4 STAINLESS STEEL (316-GRADE EQUIVALENT)

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.



OTHER MARINE AND COSTAL APPLICATIONS INCLUDE:

ANCHORING SEAWALL PANELS

ATTACHING DECKING TO CONCRETE OR STONE SUPPORTS

SECURING BRIDGE RAILINGS & GUARDRAILS

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:

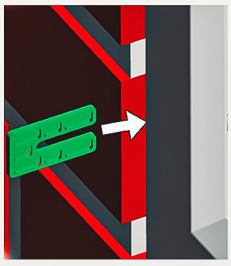
RAIL SYSTEMS MUST BE FIRMLY SECURED TO MASONRY TO SUPPORT CLADDING PANELS AND MAINTAIN ALIGNMENT OVER TIME. A4HH MASONRY SCREWS PROVIDE, SECURE ANCHORAGE AND EASE OF ADJUSTMENT.

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.

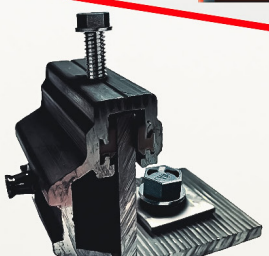
PADS & PACKERS:

ESSENTIAL FOR LEVELLING AND SPACING CLADDING SUPPORT STRUCTURES.



HANGERS & RAIL-HANGERS:

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



WHY CHOOSE EVOLUTION FASTENERS **A4HH** Range?

COMPLIANCE WITH REGIONAL STANDARDS

The A4HH range is ETA-certified, guaranteeing compliance with UK and EU construction standards and meeting regulatory requirements in both regions.

PRECISION ENGINEERING & RELIABILITY

Provides secure and consistent fixing into masonry, brick, and concrete.
The A4HH thread design delivers superior pull-out resistance and load-bearing capacity.

Whether for structural applications or high-exposure environments, you can trust its strength and reliability.

TAILORED SUPPORT & FREE TECHNICAL ASSISTANCE

Choosing Evolution Fasteners means more than just purchasing a high-performance fixing.
Our team of expert engineers offers free technical support, helping you select the right fixings for your application, optimise your installation process, and ensure compliance with regulations

We also provide tailored solutions to meet specific project requirements, giving you the confidence to complete your work efficiently .

evolution
LABORATORY

FURTHER APPLICATIONS:

CONSTRUCTION & STRUCTURAL APPLICATIONS

STRUCTURAL STEEL FIXINGS

TEMPORARY & PERMANENT FORMWORK

REINFORCEMENT MESH & REBAR SUPPORTS

PRECAST CONCRETE INSTALLATIONS

SCAFFOLD ANCHOR POINTS

INUSTRIAL & COMMERCIAL INSTALLATIONS

MACHINE BASEPLATES

PIPEWORK & CONDUIT SUPPORTS

STORAGE RACKS & SHELVING UNITS

FIXING SAFETY BARRIERS & BOLLARDS

LIFTING & HOIST BRACKETS

SPECIALISED & HARSH ENVIRONMENTS

COLD STORAGE & FREEZER ROOMS

FOOD PROCESSING & HYGIENIC FACILITIES

CHEMICAL PROCESSING PLANTS

POWER STATIONS & RENEWABLE ENERGY PROJECTS

UNDERGROUND MINING & TUNNELLING

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	$N_{Rk,s}$	[kN]	9,3	
EVO (EVO+)	$'\gamma_{Ms}$ [1)]	[-]	1,4	
PULL-OUT FAILURE				
Characteristic resistance in cracked and non-cracked concrete C20/25	$N_{Rk,p}$	[kN]	1,2	2,0
Increasing factor for $N_{Rk,p}$	Ψ_C	C25/30	1, 12	1,10
		C30/37	1,22	1,18
		C35/45	1,32	1,26
		C40/50	1,41	1,33
		C45/55	1,50	1,40
		C50/60	1,58	1,46
Partial safety factor	$'\gamma_{inst}$	[-]	1.0	
	$'\gamma_{Mp}$ [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	
Spacing	$s_{cr,N}$	[mm]	58	83
Edge distance	$C_{cr,N}$	[mm]	29	42
Spacing (splitting)	$S_{cr,sp}$	[mm]	90	84
Edge distance (splitting)	$C_{cr,sp}$	[mm]	45	63
Partial safety factor	$'\gamma_{Msp}$ [2)]	[-]	1,5 [2)]	

1) In absence of other national regulations

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

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

EVO (EVO+)			Anchor size	
			EVO (EVO+)	
			5-1	5-2
STEEL FAILURE WITHOUT LEVER ARM				
Characteristic resistance	$V_{Rk,s}$	[kN]	7,9	
Partial safety factor	$'\gamma_{Ms}$ [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	$'\gamma_{Ms}$ [1)]	[-]	1,25	
CONCRETE PRYOUT FAILURE				
k-factor	k_8	[-]	1,0	
Partial safety factor	$'\gamma_{Mc}$ [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	$'\gamma_{Mc}$ [1)]	[-]	1,5	

[1)] In absence of national regulations

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

EVO (EVO+)			Anchor size 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				
Characteristic resistance $N_{Rk,p,fi}$	R30	[kN]	0,30	0,50
	R60	[kN]	0,30	0,50
	R90	[kN]	0,30	0,50
	R120	[kN]	0,24	0,40
CONCRETE CONE AND SPLITTING FAILURE [1)]				
Characteristic resistance $N_{Rk,c,fi}$	R30	[kN]	0,28	0,70
	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: c_{min} 2> 300 mm and 2>2 x hef	

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 resistance $N_{Rk,s,fi}$	R30	[kN]	0,16	
	R60	[kN]	0,14	
	R90	[kN]	0,11	
	R120	[kN]	0,08	
STEEL FAILURE WITH LEVER ARM				
Characteristic resistance $N_{Rk,s,fi}$	R30	[Nm]	0,10	
	R60	[Nm]	0,09	
	R90	[Nm]	0,07	
	R120	[Nm]	0,05	
CONCRETE PRYOUT FAILURE				
K-FACTOR	K_8	[-]	1,0	
Characteristic resistance$V_{Rk,cp,fi}$	R30	[Nm]	0,10	
	R60	[Nm]	0,09	
	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: $v^0_{Rk,c,fi} = 0,25 \times v^0_{Rk,c}$ (S R90) $v^0_{Rk,c,fi} = 0,25 \times v^0_{Rk,c}$ (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 $C_{min} > 300$ 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.

FOR MORE INFORMATION AND TO READ THE FULL ETA REPORT, VISIT HERE:
https://evolutionfasteners.co.uk/eta/

ENTERPRISE SYSTEM™

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.

60 YEAR WARRANTY.

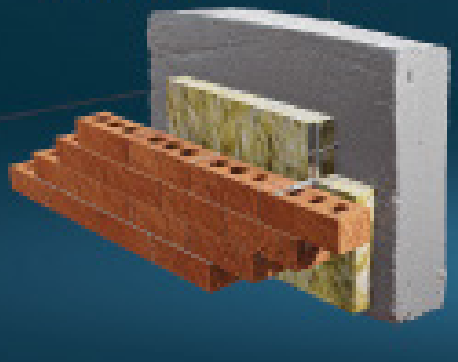
PROJECT-SPECIFIC TEST.

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.

LIGHT STEEL

CONCRETE



HEAVY STEEL

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

Email: sales@evofas.com/technical@evofas.com