



# **Foreword**

# Dear business partners,

ventilated curtain walls (VHF) combine a stylish appearance with modern technology that meets current requirements for contemporary thermal insulation. We offer innovative and high-quality complete solutions from a single source for the secure fixing of VHF. In addition to technical and economic advantages, our façade systems score points with their great freedom of design.

Thanks to undercut technology, our Zykon FZP II plate anchors exceed the holding forces and performance characteristics of conventional fixing solutions many times over. Thus, façade panels with small thicknesses and large formats can be installed. Different designs are suitable for almost all cladding materials. The undercut technology also ensures a joint pattern without visible fastening elements. We also have the right solutions for replacing panels, fixing in reveals or compensating for tolerances.

Our optimally coordinated complete system with panel anchors, suitable subframe solutions and anchor technology as well as sophisticated drilling technology speeds up and simplifies installation, shortens the construction time and consequently reduces your project costs.

With our comprehensive range of services, we support both planners and contractors worldwide in all construction phases – from consulting and dimensioning, approval procedures, installation and logistics planning to on-site instruction. We are looking forward to the mutual exchange of ideas and the continued close cooperation with you. Your suggestions are very valuable to us in order to continuously improve our products, processes and services. Feel free to contact us at any time with your questions and projects.

Have fun discovering our latest façade systems!

**Christian Knoll** 

Managing Director fischer SystemTec



"Whoever chooses fischer receives more than a range of safe products. The aim is to always develop the best solutions for our customers across the globe."

Besides the innovative products, this

Besides the innovative products, this predominantly concerns support that is focused on the customer, and services designed to improve customer benefit.

# A brand and its promise to perform.

# **Continious improvement**

The fischer ProzessSystem (fPS) we ensure that we areadapting and optimising our processes in line with customer requirements in a fl exible manner and on a continuous basis. Thus we are glad having been awarded with the 1. place "Excellence in Operations" within the challenging contest "Factory of the Year".



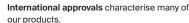
Award 2015 Exellence in Operations

# Safety that connects. Decisive quality

We don't make any compromises when it comes to the safety of our products. A whole host of our products are distinguished by comprehensive, up-to-date and international approvals. The fischer product range is well-positioned in all sectors of fixing technology – Steel, Nylon and Chemical fixings. In awardwinning quality which continues to impress both professional clients and private customers with equal measure.











# Always on the pulse of time

IAt fischer, innovation is more than just a sum of the patents. We are open to new things and are prepared for change - always with the aim of off ering our customers the greatest possible benefits. Over the years, our own development and production sites have been developing numerous fixing solutions for the most wideranging applications. Be it new production procedures or materials, such as renewable raw materials: We are carrying out the research for your safety and will continue to do so in the future. This gives us such great flexibility that we can even develop tailor-made customer solutions. This power to innovate has seen fischer become market leader in anchor technology and the fixing industry.

# Our service to you

We are a reliable partner, one that will stand at your side and address your individual requirements with advice and action:

- Our products range from chemical systems to steel anchors through to plastic anchors.
- Competence and innovation through own research, development and production.
- Global presence and active sales service in over 100 countries.
- Qualified technical consulting for economical and compliant fastening solutions. Also on-site at the construction site requested.
- Training sessions, some with accreditation, at your premises or at the fischer academy.
- Design and construction software for demanding applications.

# We take responsibility

Our active environment management policy means that we are helping to maintain an intact environment for our generation and for those that follow. The environment management policy at the Tumlingen site has been certified in line with DIN EN ISO 14001.

It fills us with particular pride that in 2020 we have received the most important and largest award in Europe in the field of sustainability: the German Sustainability Award - category large companies. This was in recognition of our holistic approach and the strategic anchoring of our sustainability management. With our greenline products we have launched the first range of fixings on the market that is based on renewable raw materials to more than 50%.









Greenline assortment based on 50% regrowing raw materials



German Sustainability Award



# About fischer façade systems:

# 1. Undercut technolgy

The fischer undercut technology contains several compatible components whose correct combination is necessary for the secure fixing of the façade panels:

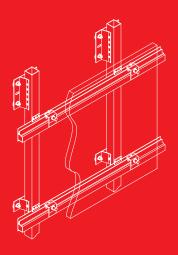
fischer Zykon panel anchor FZP II	19
Drilling technique	
Undercut drill bits	61
fischer drilling machines	53
Accessories for drilling with CNC machines	59
Testing and measuring tools for quality assurance of undercut holes	65
Setting tools for the installation of undercut anchors	69
Installation accessories for installing the undercut anchors and clasps	81



# 2. Subframe systems

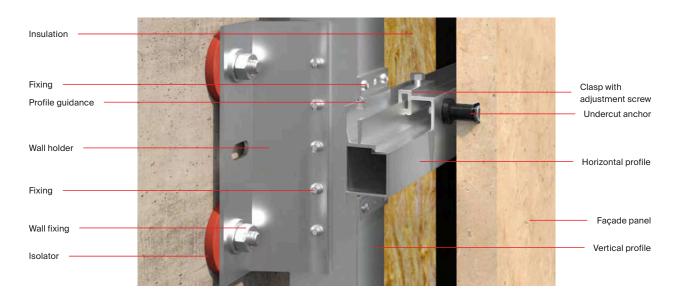
The subframe systems consists of different components for load bearing and compensation of building substrate tolerances. Therefore following system components are neccessary:

Wall holders	79
Vertical profiles	77
Horizontal profiles	74
Clasps	75
Fixing elements	89
Installation accessories	81



# Façade cross-section and system advantages.

# System overview based on a façade cross-section:



# Advantages fischer facade system:



On-site support



Technology leadership beyond the state-of-the-art



Fast supply and installation of the system



Global availability and supply of a complete system from a single source



Cost efficiency of the overall system with fischer quality



Approved and third-party certified systems and in-house test laboratory



# Innovations that inspire professionals.

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Zykon panel anchor FZP II	19	chapter	2
Machine technology and drill bits	49	chapter	3
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# 1 Introduction

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# Functional principle rainscreen façades.

# Rainscreen façades

A rainscreen façade is a ventilated double-layer cladding system which structurally separates the weather protection and insulation functions.

Based on many advantages compared to sealed façade systems rainscreen systems have become very popular nowadays.

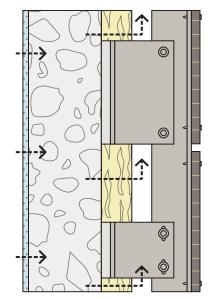
The façade system consists of the cladding material, the rear ventilation cavity, the insulation material and the subframe system, which is the structural connection between the façade cladding material and the building substrate.

Besides the aesthetic advantages there are also functional and safety benefits, which include the rear ventilation cavity and non-combustible insulation materials. These systems are less susceptible to damage than other façade systems and provide a wide freedom of design. In addition, fire, noise and lightning protection requirements can be implemented.

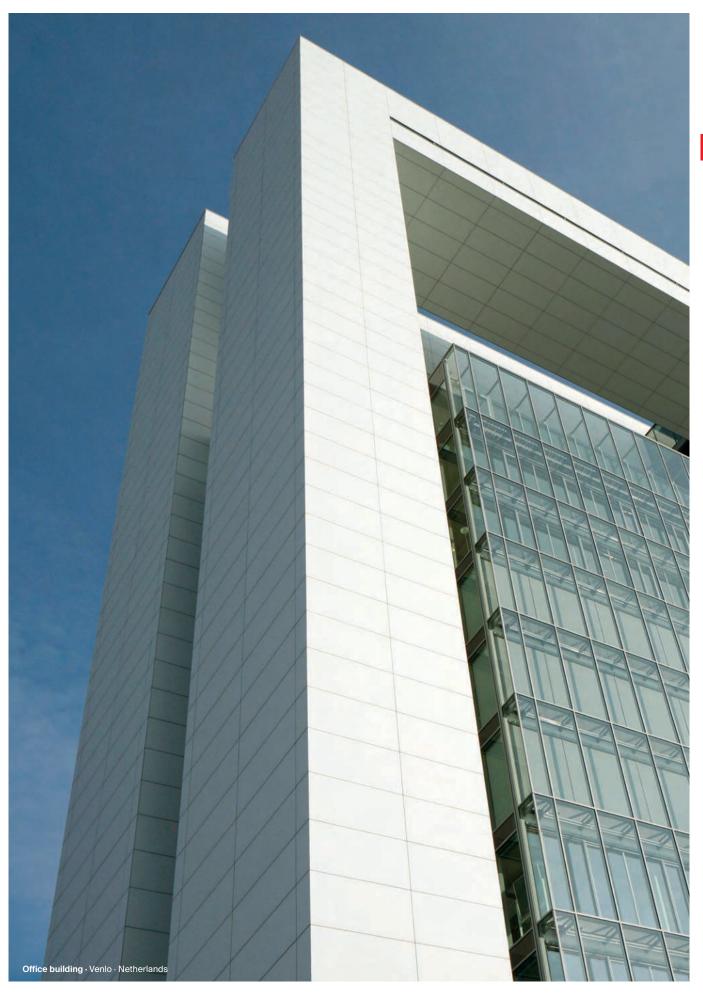
fischer offers innovative, high-quality overall façade systems for rainscreen façades. Besides functional and economical advantages, the fischer façade systems provide above all an outstanding architectural creative scope.

fischer façade systems are perfectly matched complete systems with many advantages:

- · Long system life times
- · Quick and easy installation
- · Tested and approved single components
- · Great architectural freedom of design
- · Very low maintenance intervals
- · Low maintenance costs
- Efficient thermal solution Shortened construction times
- · Etc.



Functional principle rainscreen façade with system components



# Freedom of design – fixed securely.

# Requirements for modern façades are:

- · A visually impressive design
- · Beeing technically state-of-the-art
- Economic efficiency during installation and over the entire life cycle

Whether in the construction or fixing of complete façade systems, whether in the installation of windows, the attachment of ETICS systems or in insulating, sealing and foaming, let us convince you of our products and their possible applications.

# fischer offers economical and innovative solutions for a wide range of façade applications:

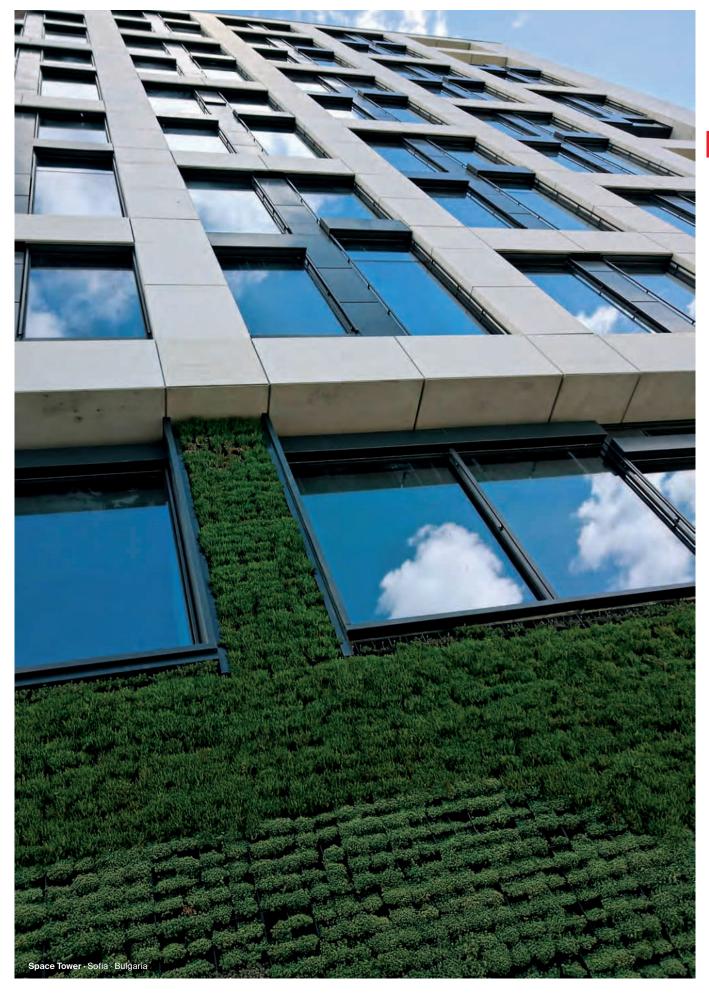
- · Heavy duty fixings in concrete
- Bespoke solutions and systems for a wide range of building materials
- Insulation plugs for ETICS
- · Façade panel anchors
- · Subframe systems
- · Foams and sealants

# Provide your projects the stability they deserve:

fischer façade systems offer architects and planners innovative, high-quality full façade systems for rainscreen façades. Besides functional and economical advantages, the fischer façade systems provide above all an outstanding architectural creative scope.

# fischer goes beyond the state of the art by offering the following benefits:

- · Subframe systems for all different cladding materials
- · Flexible system for concealed applications
- Fast and uncomplicated installation reduces costs for the whole façade
- Complies with low and zero energy building standards
- Project-specific training, consultation and product solutions
- · Global support by local representatives
- $\cdot\,$  Experience in façade systems for 35 years
- · Complete façade system supplied out of one hand
- $\cdot\;$  ETA and CE approved





# Why façade systems from fischer are the right choice.

## **Choosing fischer**

fischer is one of the most recognized brands in the world. We are a German-based family owned business with headquarter located in Waldachtal, in Germany's Northern Black Forest. fischer specializes in innovative chemical, steel and nylon anchoring systems for the construction industry. Our products range from small nylon anchors to advanced façade systems. We're committed to developing the best solutions possible for our customers across the globe. This means we're committed to every aspect of quality, design and

# **Innovative strength**

safety.

At fischer, innovation is more than just a sum of patents. We are always open to new things and are prepared for change, with the aim of offering our customers the greatest possible benefits. Over the years, our own development and production sites have been creating numerous fixing solutions for the widest range of applications. This has contributed to our product range having more than 14,000 anchors and solutions and more than 7,000 patents.

### Quality you can rely on

We do not compromise when it comes to safety. We test and certify our products to comply with international approvals and certifications. As leaders in steel, nylon and chemical fastening, we develop and provide impressive, award-winning solutions that support a variety of applications.

# The fischer façade systems are not limited to innovative system solutions - they are just starting here:

As fixing specialists we offer architects, planners and craftsmen full support from the planning phase through static calculations to just-in-time delivery to the construction site.

The provision of planning software and instruction for installers are also part of the service, as is advising on the selection of the right systems.

# The service offers for fischer façade systems at a glance

- Application technology services
- Determination of pull out loads and preparation of structural pre-calculations
- Advice on the selection of the right system components
- Support for architects, designers, structural engineers and contractors in all phases of their construction projects
- · Support with licensing procedures
- Demonstration and instruction by our trained employees
- · Services for machines
- · Worldwide and local representatives
- fischer is a member of the professional association:
   Fachverband Baustoffe und Bauteile für vorgehängte hinterlüftete Fassaden e.V.



# **2**Zykon-Panel anchor FZP II

# **ZYKON-PANEL ANCHOR FOR NATURAL STONE**

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Zykon-Glas point fixing FZP G-Z ESG	44	- 0
Zykon-Glas point fixing FZP G-Z VSG	46	-(100

# Differences in materiality.

# **Naturally Stone.**

Natural stone is a very sustainable building material as stones are natural materials, which may be sourced globally. The façade panel thicknesses range from 20 mm to 60 mm. fischer Zykon panel anchors can be used from a panel thickness of 20 mm. In addition, tolerances in panel flatness can be accommodated with

our stand-off anchors. With 35 years of experience, fischer provides support with material testing for the assessment of design resistances.



# The fischer natural stone

- · FZP II A4
- · FZP II Carbon
- · FZP II SO AL
- · FZP II SO Carbon
- · FZP II VS
- · FZP II SH
- · FZP II M8i
- · FZP II M6i

## Artificial ceramics.

Ceramic tiles are artificial materials. Typical for this type of cladding material is a wide range of colours and surface textures.

The thickness of the façade panels range from 8 mm to 20 mm. The fischer Zykon panel anchors can be used

from a thickness of 10 mm. The large disc of the anchor prevents a misalignment of the anchor when the ceramic panel has ribs on the back face.



## The fischer ceramic anchor:

· FZP II T D40

# Thin panel materials.

The most well-known examples of thin panel materials are fiber cement and HPL (high-pressure laminates). Both are artificial materials. Typical for this type of cladding material is a wide range of colours and surface textures. The thickness of the façade panels usually range from 8 mm to 12 mm. The fischer Zykon panel

anchors can be used from a panel thickness of 8 mm. fischer partners with many different suppliers for such materials.



Panel anchor for thin materials such as fibre cement and HPL:

- · FZP II T PA
- · Tergo+

# View with glass.

fischer offers the world's first undercut glass point fixing for glazings made of single-pane safety glass (ESG or ESG-H from 10 mm glass thickness) and laminated safety glass (VSG from 8 + 10 mm glass thickness). The glass panels can be enamelled or coated and may also be used as carriers for laminated solar elements.

The German Institute for Building Technology (DIBt) in Berlin has issued the fischer Zykon point fixing (FZP-G) with a general technical approval. This revolutionary development is therefore state of the art and can now be applied without the need for project-specific approval for demanding glass façades. Through the application of undercut technology our company has

succeeded in offering globally the first point fixing for glass, which does not fully penetrate the panel with a hole. The smooth exterior of the glass façade offers architects greater creative freedom and, at the same time, reduces the susceptibility to soiling and the required cleaning effort.

To install the point fixing, proprietary drilling and setting tools are required. Specially equipped and trained companies offer the finishing of the glazings and the assembly of the point fixings. On request we will be glad to arrange contact between you and these specialist installers.



# The fischer glass anchor:

- · FZP G-Z ESG
- · FZP G-Z VSG

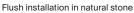
In case of any further questions regarding the different materials and their fixing solutions, we will be happy to advise you.

The universal undercut anchor made of A4 stainless steel for natural stone.

2









Façade cross-section with flush installation

# **Applications**

- Exterior façades
- · Interior façades
- · Facade reveals
- · Natural stone heating systems

### **Certificates**







ETA-11/0145



INOX STAINLESS STEEL

# **Advantages**

- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- The fixing of the undercut anchor is not visible on the exposed side, creating a visually attractive and consistent façade surface.
- Setting the anchor using undercut technology allows the user to always select
  the optimal structural position in the
  façade panel. This greatly reduces panel
  deflection.
- The anchor allows for higher pull-out loads, compared to commonly available systems.
- The flush-mounting technology of the undercut anchor allows an easy, economical handling of reveals.

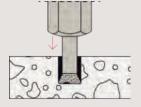
# **Functioning**

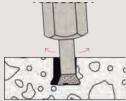
- Use wet diamond drilling first cylindrical, then conical - to drill an undercut hole.
- When the undercut anchor is installed, an optimal, positive-locking connection is created between the expanding part and the drill hole.
- The anchor is installed at the absolute anchoring depth and therefore flush with the material.

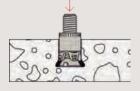
# **Building materials**

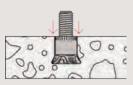
- · Natural stone (≥ 20mm)
- · Artificial concrete panels

## **Installation FZP II A4**







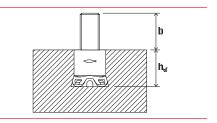




Al Hamra Tower · Kuwait



Zykon-Panel anchor FZP II A4



		Approval	Anchorage depth	Projection length	Thread	cylindrical diameter	Undercut- diameter	Min. panel thickness	Sleeve material	Sales unit
			h <sub>ef</sub>	b	М					
	Item No.		[mm]	[mm]		[mm]	[mm]	[mm]		[pcs]
Item		ETA								
FZP II 11 x 12 M6/13 A4	512131	•	12	13	M 6	11	13.5	20	stainless steel	250
FZP II 11 x 12 M6/18 A4	512133	•	12	18	M 6	11	13.5	20	stainless steel	250
FZP II 11 x 15 M6/10 A4	512134	•	15	10	M 6	11	13.5	30	stainless steel	250
FZP II 11 x 15 M6/18 A4	512135	•	15	18	M 6	11	13.5	30	stainless steel	250
FZP II 13 x 15 M8/10 A4	512136	•	15	10	M 8	13	15.5	30	stainless steel	250
FZP II 13 x 15 M8/15 A4	512137	•	15	15	M 8	13	15.5	30	stainless steel	250
FZP II 13 x 15 M8/23 A4	512138	•	15	23	M 8	13	15.5	30	stainless steel	250
FZP II 13 x 15 M8/28 A4	512139	•	15	28	M 8	13	15.5	30	stainless steel	250
FZP II 13 x 17 M8/17 A4	512140	•	17	17	M 8	13	15.5	30	stainless steel	250
FZP II 13 x 21 M8/9 A4	512141	•	21	9	M 8	13	15.5	35	stainless steel	250
FZP II 13 x 21 M8/17 A4	512142	•	21	17	M 8	13	15.5	35	stainless steel	250
FZP II 13 x 21 M8/22 A4	512143	•	21	22	M 8	13	15.5	35	stainless steel	250

# Zykon-Panel anchor FZP II Carbon

The universal carbon fibre-reinforced undercut anchor for natural stone.









Façade cross-section with flush installation

# **Applications**

- Exterior façades
- · Interior façades
- · Façade reveals
- · Natural stone heating systems

### **Certificates**







ETA-11/0145



INOX STAINLESS STEEL

# **Advantages**

- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- The fixing of the undercut anchor is not visible on the exposed side, creating a visually attractive and consistent façade surface.
- Setting the anchor using undercut technology allows the user to always select
  the optimal structural position in the
  façade panel. This greatly reduces panel
  deflection.
- The anchor allows for higher pull-out loads, compared to commonly available systems.
- The flush-mounting technology of the undercut anchor allows an easy, economical handling of reveals.

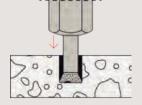
# **Functioning**

- Use wet diamond drilling first cylindrical, then conical - to drill an undercut hole.
- When the undercut anchor is installed, an optimal, positive-locking connection is created between the expanding part and the drill hole.
- The anchor is installed at the absolute anchoring depth and therefore flush with the material.

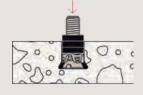
# **Building materials**

- Natural stone (≥ 20mm)
- · Artificial concrete panels

## **Installation FZP II Carbon**







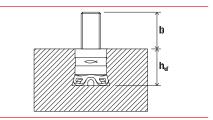




 $\textbf{Court Complex} \cdot \textbf{Hawaaly} \cdot \textbf{Kuwait}$ 



Zykon-Panel anchor FZP II Carbon



		Approval	Anchorage depth	Projection length	Thread	cylindrical diameter	Undercut- diameter	Min. panel thickness	Sleeve material	Sales unit
			h <sub>ef</sub>	b	М					
	Item No.		[mm]	[mm]		[mm]	[mm]	[mm]		[pcs]
Item		ETA								
FZP II 11 x 12 M6/13 CARBON	511966	•	12	13	M 6	11	13.5	20	Carbon	250
FZP II 11 x 12 M6/18 CARBON	511967	•	12	18	M 6	11	13.5	20	Carbon	250
FZP II 11 x 15 M6/10 CARBON	511968	•	15	10	M 6	11	13.5	30	Carbon	250
FZP II 11 x 15 M6/18 CARBON	511969	•	15	18	M 6	11	13.5	30	Carbon	250
FZP II 13 x 15 M8/10 CARBON	511970	•	15	10	M 8	13	15.5	30	Carbon	250
FZP II 13 x 15 M8/15 CARBON	511971	•	15	15	M 8	13	15.5	30	Carbon	250
FZP II 13 x 15 M8/23 CARBON	511972	•	15	23	M 8	13	15.5	30	Carbon	250
FZP II 13 x 15 M8/28 CARBON	511973	•	15	28	M 8	13	15.5	30	Carbon	250
FZP II 13 x 17 M8/17 CARBON	511980	•	17	17	M 8	13	15.5	30	Carbon	250
FZP II 13 x 21 M8/9 CARBON	511974	•	21	9	M 8	13	15.5	35	Carbon	250
FZP II 13 x 21 M8/17 CARBON	511975	•	21	17	M 8	13	15.5	35	Carbon	250
FZP II 13 x 21 M8/22 CARBON	511976	•	21	22	M 8	13	15.5	35	Carbon	250

# Zykon-Panel anchor FZP II SO AL

The adjusting undercut anchor made of A4 stainless steel for natural stone.







Façade cross-section with stand-off installation

# **Applications**

- Exterior façades with high aesthetic requirements
- Interior façades with high aesthetic requirements

### **Certificates**







ETA-11/0145



INOX STAINLESS STEEL

# **Advantages**

- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- The fixing of the undercut anchor is not visible on the exposed side, creating a visually attractive and consistent façade surface.
- Setting the anchor using undercut technology allows the user to always select the optimal structural position in the façade panel. This greatly reduces panel deflection.
- The anchor allows for higher pull-out loads, compared to commonly available systems.
- Using a constant remaining wall thickness as a reference value when drilling holes allows users to compensate panel thickness tolerances.

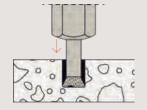
# **Functioning**

- Wet diamond drilling first cylindrical to a constant reference dimension for the remaining wall thickness (RWT), then conical to create an undercut drill hole.
- When the undercut anchor is installed, an optimal positive-locking connection is created between the expanding part and the drill hole.
- The anchor is installed in the conical undercut drill hole using stand-off installation
- The ability to compensate for panel thickness tolerances helps create a flat façade surface.

# **Building materials**

- · Natural stone (≥ 20mm)
- · Artificial concrete panels

# Installation FZP II SO AL











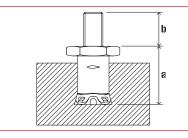




99 Hudson · New York · USA



Zykon-Panel anchor FZP II SO AL



		Approval	Installed anchor length	Anchorage depth	Projection length	Thread	cylindrical diameter	Undercut- diameter	Min. panel thickness	Sleeve material	Sales unit
			a	h <sub>ef</sub>	b	M					
	Item No.		[mm]	[mm]	[mm]		[mm]	[mm]	[mm]		[pcs]
Item		ETA									
FZP II 11 x 21 M6/S0/9 AL	512144	•	21	12 - 16	9	M 6	11	13.5	20	stainless steel	250
FZP II 11 x 21 M6/S0/12 AL	512145	•	21	12 - 16	12	M 6	11	13.5	20	stainless steel	250
FZP II 13 x 26 M8/S0/17 AL	512146	•	26	15 - 21	12	M 8	13	15.5	30	stainless steel	250
FZP II 13 x 30 M8/S0/13 AL	513226	•	30	15 - 25	12	M 8	13	15.5	30	stainless steel	250
FZP II 13 x 26 M8/S0/12 AL	538088	•	26	15 - 21	12	M 8	13	15.5	30	stainless steel	250

# **Zykon-Panel anchor FZP II SO Carbon**

The adjusting carbon fibre-reinforced undercut anchor for natural stone.









Façade cross-section with stand-off installation

# **Applications**

- Exterior façades with high aesthetic requirements
- Interior façades with high aesthetic requirements

### **Certificates**







ETA-11/0145



INOX STAINLESS STEEL

# **Advantages**

- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- The fixing of the undercut anchor is not visible on the exposed side, creating a visually attractive and consistent façade surface.
- Setting the anchor using undercut technology allows the user to always select the optimal structural position in the façade panel. This greatly reduces panel deflection.
- The anchor allows for higher pull-out loads, compared to commonly available systems.
- Using a constant remaining wall thickness as a reference value when drilling holes allows users to compensate panel thickness tolerances.

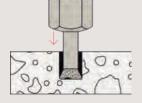
# **Functioning**

- Wet diamond drilling first cylindrical to a constant reference dimension for the remaining wall thickness (RWT), then conical to create an undercut drill hole.
- When the undercut anchor is installed, an optimal positive-locking connection is created between the expanding part and the drill hole.
- The anchor is installed in the conical undercut drill hole using stand-off installation
- The ability to compensate for panel thickness tolerances helps create a flat façade surface.

# **Building materials**

- · Natural stone (≥ 20mm)
- · Artificial concrete panels

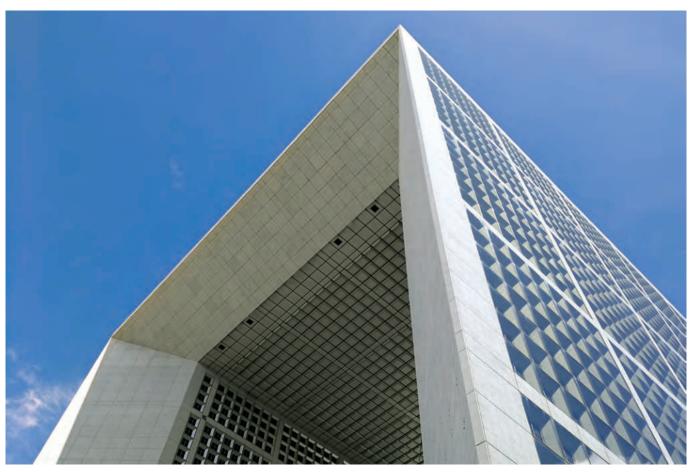
# **Installation FZP II SO Carbon**







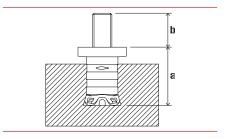




La Grande Arche · Paris · France



Zykon-Panel anchor FZP II SO Carbon



		Approval	Installed anchor length	Anchorage depth	Projection length	Thread	cylindrical diameter	Undercut- diameter	Min. panel thickness	Sleeve material	Sales unit
			a	h <sub>ef</sub>	b	М					
	Item No.		[mm]	[mm]	[mm]		[mm]	[mm]	[mm]		[pcs]
Item		ETA									
FZP II 11 x 21 M6/S0/9 CARBON	511977	•	21	12 - 16	9	M 6	11	13.5	20	Carbon	250
FZP II 11 x 21 M6/S0/12 CARBON	511978	•	21	12 - 16	12	M 6	11	13.5	20	Carbon	250
FZP II 13 x 26 M8/S0/12 CARBON	538087	•	26	15 - 21	12	M 8	13	15.5	30	Carbon	250
FZP II 13 x 26 M8/SO/17 CARBON	511979	•	26	15 - 21	17	M 8	13	15.5	30	Carbon	250

# Zykon-Panel anchor FZP II VS

The suspension anchor with the fischer Vertical Solution for natural stone façade panels.







Façade cross-section with suspension anchor

**Applications** 

- Exterior façades with high aesthetic requirements and a reduced wall construction
- Interior façades with high aesthetic requirements and a reduced wall construction

### **Certificates**







ETA-11/0145



INOX STAINLESS STEEL

# **Advantages**

- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- The fixing of the undercut anchor is not visible on the exposed side, creating a visually attractive and consistent façade surface.
- Setting the anchor using undercut technology allows the user to always select the optimal structural position in the façade panel. This greatly reduces panel deflection.
- The anchor allows for higher pull-out loads, compared to commonly available systems.
- Using a constant remaining wall thickness as a reference value when drilling holes allows users to compensate panel thickness tolerances.

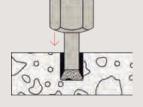
# **Functioning**

- Wet diamond drilling first cylindrical to a constant reference dimension for the remaining wall thickness (RWT), then conical to create an undercut drill hole.
- When the undercut anchor is installed, an optimal positive-locking connection is created between the expanding part and the drill hole.
- The anchor is installed in the conical undercut drill hole using stand-off installation
- The ability to compensate panel thickness tolerances helps create a flat façade surface.
- Suspension brackets designed based on a lock and key principle are also used during installation.

# **Building materials**

· Natural stone (≥ 20mm)

# **Installation FZP II VS**



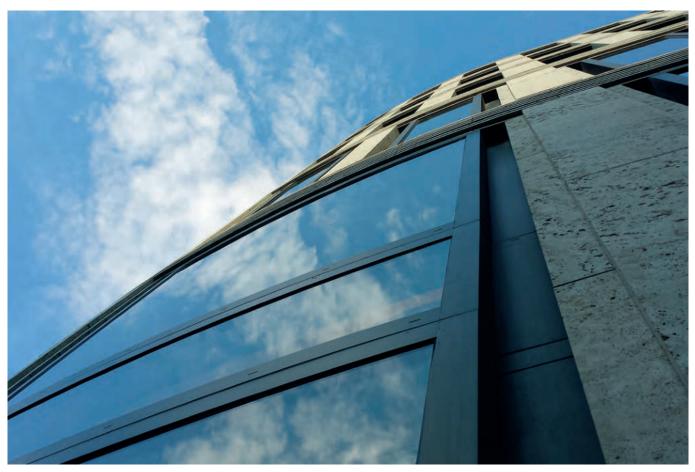








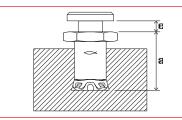




Concorde Hotel  $\cdot$  Berlin  $\cdot$  Germany



Zykon-Panel anchor FZP II VS



		Approval	Installed anchor length	Anchorage depth	Useable length	Thread	cylindrical diameter	Undercut- diameter	Min. panel thickness	Sleeve material	Sales unit
			a	h <sub>ef</sub>	е	M					
	Item No.		[mm]	[mm]	[mm]		[mm]	[mm]	[mm]		[pcs]
Item		ETA									
FZP II 11 x 21 M6/VS/4 AL	512147	•	21	12 - 16	4.5	M 6	11	13.5	20	stainless steel	250
FZP II 13 x 26 M8/VS/4 AL	512148	•	26	15 - 21	4.5	M 8	13	15.5	30	stainless steel	250
FZP II 13 x 30 M8/VS/4 AL	512149	•	30	15 - 25	4.5	M 8	13	15.5	30	stainless steel	250

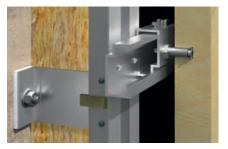
# Zykon-Panel anchor FZP II SH

The undercut anchor for soft stone façade panels.









Facade cross-section with soft stone anchor

## **Applications**

- Exterior façades with heavy façade panels made of selected, soft natural stone (stone group IV - sedimentary rock)
- Interior façades with heavy façade panels made of selected, soft natural stone (stone group IV - sedimentary rock)

### **Certificates**



INOX STAINLESS STEEL

# **Advantages**

- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- The attachment point is not externally visible, creating a visually attractive and consistent façade surface.
- Setting the anchor using undercut technology allows the user to always select the optimal structural position in the façade panel. This greatly reduces panel deflection
- The anchor allows for higher breaking loads, compared to commonly available systems.
- Using a constant remaining wall thickness as a reference value when drilling holes allows users to compensate for panel thickness tolerances.

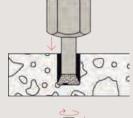
# **Functioning**

- Wet diamond drilling first cylindrical, depending on the application either to the absolute anchoring depth or to a constant reference dimension for the remaining wall thickness (RWT), then conical to create an undercut drill hole.
- When the undercut anchor is installed, an optimal positive-locking connection is created between the expanding part and the drill hole.
- The anchor can either be installed flush to the absolute anchoring depth or can be installed in the conical undercut drill hole using stand-off installation.
- The ability to compensate panel thickness tolerances helps create a flat façade surface.

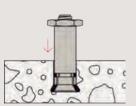
# **Building materials**

· Natural stone (stone group IV) (≥ 50mm)

# Installation FZP II SH











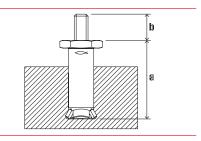




Bucherer · Zurich · Switzerland



Zykon-Panel anchor FZP II SH



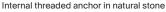
		Installed anchor length	Anchorage depth	Projection length	Thread	cylindrical diameter	Undercut- diameter	Min. panel thickness	Sleeve material	Sales unit
		а	h <sub>ef</sub>	b	М					
	Item No.	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]		[pcs]
Item										
FZP 13 x 30 M8//23 SH A4	521103	30	30	23	M 8	13	17.3	50	stainless steel	50
FZP 13 x 41 M8/S0/19 SH AL	521104	41	30 - 36	19	M 8	13	17.3	50	stainless steel	50

# Zykon-Panel anchor FZP II M8i

The undercut anchor with an internal thread for M8 threaded screws in natural stone façade panels.









Façade cross-section with internal threaded anchor

# **Applications**

- Exterior façades
- · Interior façades
- · Facade reveals

### **Certificates**





ETA-11/0145

INOX STAINLESS STEEL

## **Advantages**

- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- The fixing of the undercut anchor is not visible on the exposed side, creating a visually attractive and consistent façade surface.
- The anchor allows for higher pull-out loads, compared to commonly available systems
- The flush-mounted anchor allows for easy, economical construction of reveals.
- Depending on the application, the user can choose between flush installation with an absolute anchoring depth, for instance for reveal panels, and stand-off installation technology with a constant remaining wall thickness that serves as a reference dimension to compensate panel thickness tolerances.
- There is no protruding external thread, allowing a space-saving transportation of pre-fabricated façade panels.

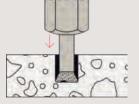
# **Functioning**

- Wet diamond drilling first cylindrical, depending on the application either to the absolute anchoring depth or to a constant reference dimension for the remaining wall thickness (RWT), then conical to create an undercut drill hole.
- When the undercut anchor is installed, an optimal positive-locking connection is created between the expanding part and the drill hole.
- The anchor can either be installed flush to the absolute anchoring depth or can be installed in the conical undercut drill hole using stand-off installation.
- The ability to compensate panel thickness tolerances helps create a flat façade surface.

# **Building materials**

· Natural stone (≥ 20mm)

### **Installation FZP II M8i**







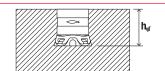




 $fischer\ administration\ building\cdot Waldachtal\cdot Germany$ 



Zykon-Panel anchor FZP II M8i



		Approval	Anchorage depth	cylindrical diameter		Min. panel thick- ness	Sleeve material	Sales unit
Item	Item No.	ETA	[mm]	[mm]	[mm]	[mm]		[pcs]
FZP II 15 x 12 M8i	539478	•	12	15	17.5	20	Carbon	250
FZP II 15 x 15 M8i	539479	•	15	15	17.5	25	Carbon	250
FZP II 15 x 21 M8i	540298	•	21	15	17.5	35	Carbon	250

These anchors are supplied with dust protection caps. These can be used to protect the internal thread from contamination if the undercut anchors are prefabricated at the factory and delivered to the construction site without an installed set thread.

# Zykon-Panel anchor FZP II M6i

The undercut anchor with an internal thread for M6 threaded screws in natural stone façade panels.









Façade cross-section with internal threaded anchor

# **Applications**

Indoor applications (such as wash basins, natural stone heating systems, ...)

### **Certificates**



INOX STAINLESS STEEL

# **Advantages**

- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- The fixing of the undercut anchor is not visible on the exposed side, creating a visually attractive and consistent façade surface.
- The high-quality material of the anchor allows for higher pull-out loads than commonly used systems.
- The integrated internal thread allows panels to be pre-fabricated and transported securely.

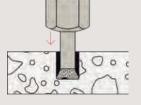
# **Functioning**

- Wet diamond drilling first cylindrical, depending on the application either to the absolute anchoring depth or to a constant reference dimension for the remaining wall thickness (RWT), then conical to create an undercut drill hole.
- When the undercut anchor is installed, an optimal positive-locking connection is created between the expanding part and the drill hole.
- The anchor can either be installed flush to the absolute anchoring depth or can be installed in the conical undercut drill hole using stand-off installation.
- The ability to compensate panel thickness tolerances helps create a flat façade surface.

# **Building materials**

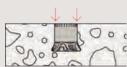
· Natural stone (≥ 20mm)

# Installation FZP II M6i







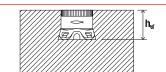




Huyyu-Chen-Fong · Taiwan



Zykon-Panel anchor FZP II M6i



		Anchorage depth	cylindrical diameter	Undercutdiameter	Min. panel thick- ness	Sleeve material	Sales unit
	Item No.	h <sub>ef</sub> [mm]	[mm]	[mm]	[mm]		[pcs]
Item							
FZP II 13 x 12 M6i	512958	12	13	15.5	20	Polyamide PA6	250

## Zykon-Panel anchor FZP II T Tergo+

The specialist for thin fibre cement façade panels by Equitone.





Tergo+ in Equitone fibre cement boards



Facade cross-section with Tergo+ anchor

#### **Applications**

- Exterior façades
- · Interior façades
- · Facade reveals

#### **Certificates**







#### **Advantages**

- The anchors' short geometry allows it to be used in thin panels with a thickness greater than 8 mm.
- The fixing of the undercut anchor is not visible on the exposed side, creating a visually attractive and consistent façade surface.
- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- Setting the anchor using undercut technology allows the user to always select the optimal structural position in the façade panel. This greatly reduces panel deflection.
- The positive-locking anchor is free from expansion pressure and is attached at the fifth point in a structurally optimised location. This provides much better holding force than commonly available systems and allows for the use of large-format panels.

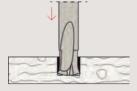
#### **Functioning**

- Use dry drilling with a diamond drill bit first cylindrical, then conical - to drill an undercut hole.
- When the undercut anchor is installed, an optimal, positive-locking connection is created between the expanding part and the drill hole.
- The anchor is installed flush to the absolute anchoring depth. After the anchor is set, the spacer washer will be in full contact with the surface of the material.

#### **Building materials**

· Equitone fibre cement (≥ 8mm)

#### Installation FZP II T Tergo+







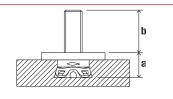




 ${\sf Cahir \ Castle \cdot Tipperary \cdot Ireland}$ 

#### **Technical data**





Tergo+ 11 x 6

Tergo+ 11 x 8

Tergo+ 11 x 10

		Approval	Installed anchor length	Anchorage depth	Projection length	Thread	cylindrical diameter	Undercut- diameter	Min. panel thickness	Sleeve material	Sales unit
			a	h <sub>ef</sub>	b	Ø x length					
	Item No.		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[pcs]
Item		DIBt									
Tergo+11 x 6 M6/T/10 PA	532641	•	8.5	6	10		11	13.5	8	Polyamide PA6	250
Tergo+11 x 6 M6/T/13 PA	532642	•	8.5	6	13		11	13.5	8	Polyamide PA6	250
Tergo+11 x 8 M6/T/10 PA	537974	•	10.5	8	10		11	13.5	12	Polyamide PA6	250
Tergo+11 x 8 M6/T/13 PA	537975	•	10.5	8	13		11	13.5	12	Polyamide PA6	250
Tergo+11 x 10 M6/T/9 PA	532643	•	12.5	10	9		11	13.5	14	Polyamide PA6	250

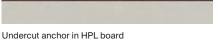
 $These \ anchors \ are \ supplied \ with \ M6 \ locknuts, \ which \ have \ to \ be \ used \ for \ the \ installation \ of \ the \ clasps.$ 

## **Zykon-Panel anchor FZP II T PA**

The specialist for thin façade panels, such as HPL and fibre cement.









Façade cross-section with FZP II T PA

#### **Applications**

- Exterior façades
- Interior façades
- Facade reveals

#### **Certificates**





ETA-11/0465

#### **Advantages**

- · The anchor's short geometry allows it to be used in thin panels with a thickness greater than 8 mm.
- The fixing of the undercut anchor is not visible on the exposed side, creating a visually attractive and consistent façade surface.
- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- Setting the anchor using undercut technology allows the user to always select the optimal structural position in the façade panel. This greatly reduces panel deflection.
- · The positive-locking anchor is free from expansion pressure provides much better holding force than commonly available systems and allows for the use of large-format panels.

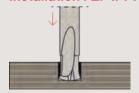
#### **Functioning**

- · Use dry drilling with a diamond drill bit first cylindrical, then conical - to drill an undercut hole.
- When the undercut anchor is installed. an optimal, positive-locking connection is created between the expanding part and the drill hole.
- The anchor is installed flush to the absolute anchoring depth. After the anchor is set, the spacer washer will be in full contact with the surface of the material.

#### **Building materials**

- · Fibre cement
- · HPL panels
- · Thin panel materials (≥ 8 mm)

#### Installation FZP II T PA





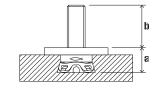






Stabilo Cube  $\cdot$  Heroldsberg  $\cdot$  Germany





FZP II-T PA 11 x 6

FZP II-T PA 11 x 8

FZP II-T PA 11 x 10

		Approval	Installed anchor length	Anchorage depth	Projection length	Thread	cylindrical diameter	Undercut- diameter	Min. panel thickness	Sleeve material	Sales unit
			a	h <sub>ef</sub>	b	Ø x length					
	Item No.		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[pcs]
Item		ETA									
FZP II 11 x 6 M6/T/10 PA	520365	•	8.5	6	10		11	13.5	8	Polyamide PA6	250
FZP II 11 x 8 M6/T/12 PA	520367	•	10.5	8	12		11	13.5	10	Polyamide PA6	250
FZP II 11 x 10 M6/T/9 PA	520369	•	12.5	10	9		11	13.5	12	Polyamide PA6	250

## Zykon-Panel anchor FZP II T D40

The specialist for thin ceramic façade panels.





Undercut anchor in ceramic tiles



Façade cross-section with ceramic anchor

#### **Applications**

- · Exterior façades
- · Interior façades
- · Facade reveals

#### **Certificates**





ETA-11/0465

#### **Advantages**

- The anchors' short geometry allows it to be used in thin panels with a thickness greater than 10 mm.
- The fixing of the undercut anchor is not visible on the exposed side, creating a visually attractive and consistent façade surface.
- The adapted shape of the undercut anchor ensures a positive-locking attachment free from expansion pressure in a conical undercut drill hole.
- Setting the anchor using undercut technology allows the user to always select the optimal structural position in the façade panel. This greatly reduces panel deflection.
- The positive-locking anchor is free from expansion pressure provides much better holding force than commonly available systems and allows for the use of large-format panels.

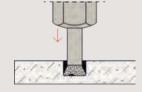
#### **Functioning**

- Use wet diamond drilling first cylindrical, then conical - to drill an undercut hole.
- When the undercut anchor is installed, an optimal positive-locking connection is created between the expanding part and the drill hole.
- The anchor is installed flush to the absolute anchoring depth. After the anchor is set, the spacer washer will be in full contact with the surface of the material.

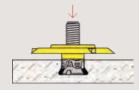
#### **Building materials**

- · Ceramics
- · Fine stoneware (≥ 10mm)

#### Installation FZP II T D40









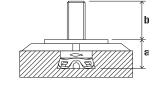


Nieuwe Haagse Passage  $\cdot$  The Hague  $\cdot$  Netherlands









FZP II 11 x 6 D40

FZP II 11 x 8 D40

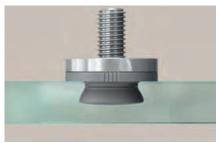
FZP II 11 x 9 D40

		Approval	Installed anchor length	Anchorage depth	Projection length	Thread	cylindrical diameter	Undercut- diameter	Min. panel thickness	Sleeve material	Sales unit
			a	h <sub>ef</sub>	b	Ø x length					
	Item No.		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[pcs]
Item		ETA									
FZP II 11 x 6 M6/T/9 D40 PA	532644	•	9.5	6	9		11	13.5	10	Polyamide PA6	250
FZP II 11 x 8 M6/T/10 D40 PA	532645	•	11.5	8	10		11	13.5	12	Polyamide PA6	250
FZP II 11 x 9 M6/T/9 D40 PA	532646	•	12.5	9	9		11	13.5	13	Polyamide PA6	250

## Zykon-Glas point fixing FZP G Z ESG

The glass point holder for aesthetic fixing of single layered glass façade panels.









Façade cross-section with single layered glass panel

#### **Applications**

- · Exterior façades
- · Interior façades
- · Glass facades

#### **Certificates**





#### **Advantages**

- The geometry of the anchor requires only a small drill hole diameter, allowing for a discreet and visually attractive fixing solution.
- There is no need to drill through the glass façade panel to install the anchor.
   This adds more safety. The fastening point remains inside the façade panels and does not penetrate through to the outside. This reduces the danger of contamination and ensures a good seal.
- Create an undercut drill hole and chamfer the edge of the drill hole in one work step.

#### **Functioning**

- Before glass hardening: use wet diamond drilling - first cylindrical, then conical - to drill an undercut hole.
- After drilling the glass, the glass must be hardened before the undercut anchors can be set.
- When the undercut anchor is set, an optimal, positive-locking connection is created between the expanding part and the drill hole.

#### **Building materials**

- · Single layer safety glass (≥ 10mm)
- · Glass ceramic (≥ 10mm)

#### Installation in single layer safety glass













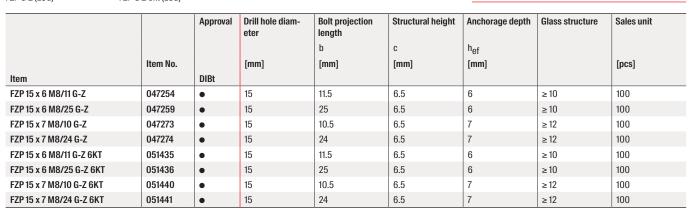
Bahai Temple  $\cdot$  Santiago de Chile  $\cdot$  Chile

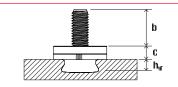




FZP G Z (ESG)

FZP G Z 6kt (ESG)





## Zykon-Glas point fixing FZP G Z VSG

The glass point holder for aesthetic fixing of laminated composite safety glass.





Glass point holder in laminated composite safety alass



Façade cross-section with laminated composite safety glass

#### **Applications**

- · Exterior façades
- · Interior façades

#### **Certificates**







#### **Advantages**

- · The geometry of the anchor requires only a small drill hole diameter, allowing for a discreet and visually attractive fixing solution.
- There is no need to drill through the glass façade panel to install the anchor. This adds more safety. The fastening point remains inside the façade panels and does not penetrate through to the outside. This reduces the danger of contamination and ensures a good seal.
- Create an undercut drill hole and chamfer the edge of the drill hole in one work step.

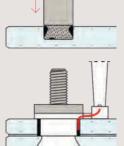
#### **Functioning**

- · Before glass hardening: use wet diamond drilling - first cylindrical, then conical - to drill an undercut hole.
- After drilling the glass, the glass must be hardened before the undercut anchors can be set.
- · When the undercut anchor is set, an optimal, positive-locking connection is created between the expanding part and the drill hole.

#### **Building materials**

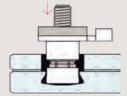
· Laminated composite safety glass (>18mm)

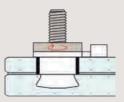
#### Installation in laminated composite safety glass

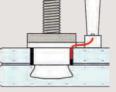


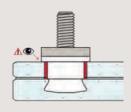










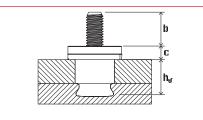




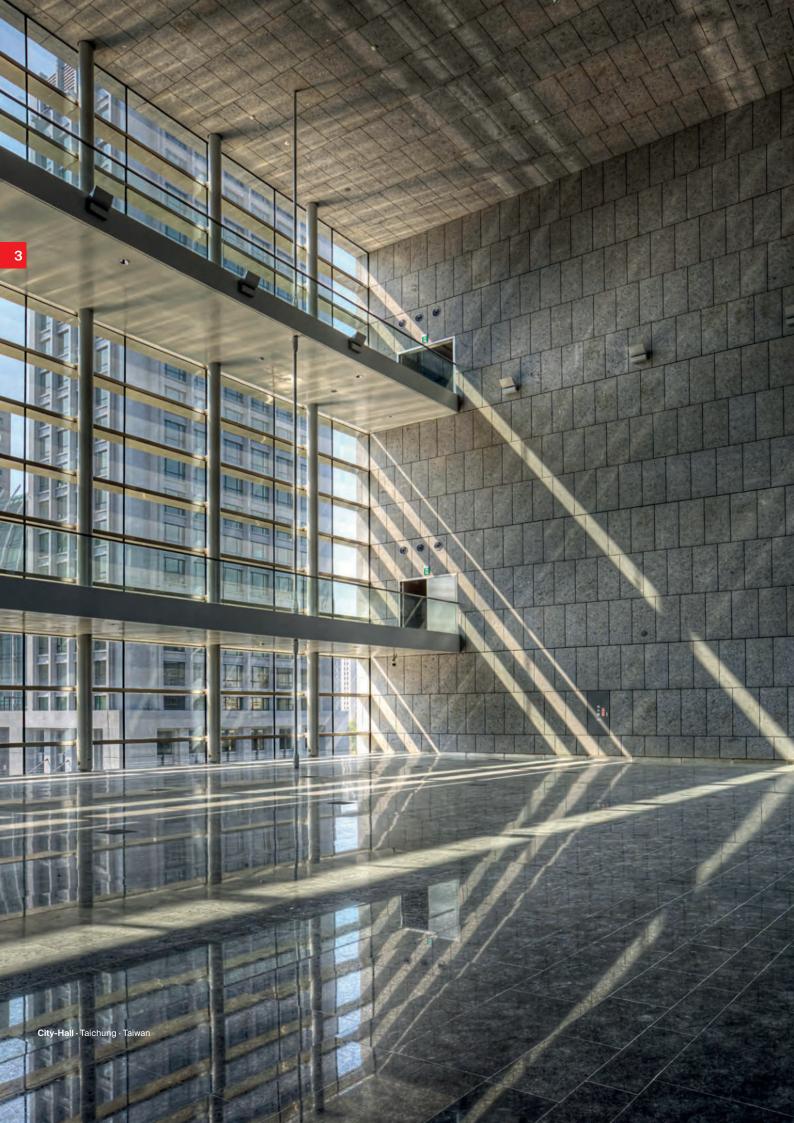
FRAC art centre · Marseille · France







		Approval	Drill hole diameter	Structural height	Bolt projection length	Anchorage depth	Glass struc- ture	Thread	Sales unit
				С	b	h <sub>ef</sub>		A	
	Item No.		[mm]	[mm]	[mm]	[mm]			[pcs]
Item		DIBt							
FZP 15 x 15,5 M8/16 G-Z	047300	•	15	6.5	16	15,5	10/8	M 8	100
FZP 15 x 17,5 M8/14 G-Z	050407	•	15	6.5	14	17,5	10/10	M 8	100
FZP 15 x 15,5 M8/16 G-Z 6KT	051442	•	15	6.5	16	15,5	10/8	M 8	100
FZP 15 x 17,5 M8/14 G-Z 6KT	051447	•	15	6.5	14	17,5	10/10	M 8	100



# 3

# Machine technology and drill bits

#### **DRILLING MACHINES**

Mobile drilling equipment BSN 100	53	
Drill rig SBN 502	54	
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Measuring equipment	65	
SETTING TOOLS		
Setting tools	69	

# A fully coordinated complete system.

The perfect solution for rainscreen façades.

Just as much know-how as for the development of the Zykon panel anchor and sub-frame systems has been invested in the machine technology. This forms an indispensable part of the façade system.

The machine technology includes not only fischer drilling machines and drill bits, which are specially developed for the creation of the undercut drill holes, but also

test and measuring equipment for quality control of the hole geometry and setting tools to ensure safe and fast installation of the fischer Zykon panel anchors.

In addition, it is possible to make the undercut holes using your own CNC machining equipment.



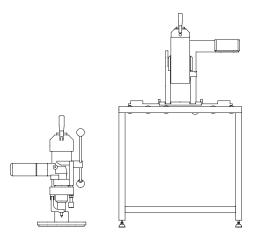
## **Drilling machines**

to ensure correct undercut drill hole geometry for fischer Zykon panel anchors.

fischer offers proprietary machines of various sizes, from portable on-site up to large-scale production equipment. These machines enable the fast and economic production of drill holes with diamond drilling tools. Quality control of the drilled holes is then carried out by taking the hole dimensions with the testing and measuring equipment and comparing them with the target dimensions and tolerance specifications. Finally, the undercut anchors are installed in the undercut holes of the façade panels using the appropriate setting devices.

The fixing specialists at fischer façade systems offer a wide range of services in this context:

- · Diverse range of machines
- · Large-scale production machines
- · Support with machine selection
- · Purchase/rental of the machines



## Mobile drilling equipment BSN 100

Undercut drilling machines for wet diamond drilling of natural stone and ceramic façade panels.



#### **Advantages**

- · Easy handling
- Economic creation of undercut drill holes
- · Construction site machine

#### **Functioning**

- · Diamond drilling
- · Water cooling
- · Undercutting
- Wet drillingVacuum

#### **Building materials**

- · Natural stone (≥ 20mm)
- · Artificial concrete panels
- · Ceramics (≥ 10 mm)
- · Solid-surface materials

		Useable material	Drill bit	Drilling Technology	Dimensions	Weight	Connections	Power input	Water con- nection	Water con- sumption
Item	Item No.				[mm]	[kg]		[W]		
BSN 100 VP	061502 <sup>2)</sup>	natural stone, ceramic	Diamond drill bit	Manual MB 1	340 x 450 x 480	20	230 V, 10/16 A	1200	1/2 inch cross section, at least 2 bar fresh water	1,5 L/min (idle running)
BSN 100 VD	046223	natural stone, ceramic	Diamond drill bit	Manual MB 1	340 x 450 x 480	20	230 V, 10/16 A	1200	1/2 inch cross section, at least 2 bar fresh water	1,5 L/min (idle running)

<sup>1)</sup> Supplied with a venturi nozzle #802111

<sup>2)</sup> Supplied with a vacuum pump #802597

## **Drill rig SBN 502**

Undercut drilling machines for wet diamond drilling of natural stone and ceramic façade panels.



#### **Advantages**

- · Easy handling
- Economic creation of undercut drill holes in production
- · Compact dimensions

#### **Functioning**

- · Diamond drilling
- · Water cooling
- · Undercutting
- · Wet drilling

#### **Building materials**

- · Natural stone (≥ 20mm)
- · Artificial concrete panels
- · Ceramics (≥ 10 mm)
- · Solid-surface materials

		Useable material	Drill bit	Drilling Technology	Dimensions	Table skew- ness	Weight	Connec- tions	Power input	Water con- nection	Water con- sumption
Item	Item No.				[cm]	[cm]	[kg]		[W]		
SBN 502	061500	natural stone, ceramic	Diamond drill bit	Manual MB 2	210 x 140 x 160	170 x 130 x 80	450	230 V, 10/16 A	2 x 1000	1/2 inch cross section, at least 2 bar fresh water	1,5 L/ min (idle running)

## Mobile drilling equipment LBT 80

Undercut drilling machines for wet diamond drilling of natural stone and ceramic façade panels.



#### **Advantages**

- · Easy handling
- Economic creation of undercut drill holes in reveal panels
- · Compact dimensions

#### **Functioning**

- · Diamond drilling
- · Water cooling
- · Undercutting
- · Wet drilling

#### **Building materials**

- · Natural stone (≥ 20mm)
- · Artificial concrete panels
- · Ceramics (≥ 10 mm)
- · Solid-surface materials

		Useable material	Drill bit	Drilling Technology	Dimensions	Table skew- ness	Weight	Connec- tions	Power input	Water con- nection	Water con- sumption
Item	Item No.				[cm]	[cm]	[kg]		[w]		
LBT 80	046225	natural stone, ceramic	Diamond drill bit	Manual MB 2	72 x 80 x 142	40 x 80 x 75	65	230 V, 10/16 A	1000	1/2 inch cross section, at least 2 bar fresh water	1,5 L/ min (idle running)

### Manual drill head MB 2

Undercut drilling machines for mounting on existing processing lines for wet drilling of facade panels made of natural stone and ceramics.



#### **Advantages**

- · easy attachment with a flange plate
- smallest drilling unit from fischer with the advantages of the big machines
- · possibility of individual solutions

#### **Functioning**

- · Diamond drilling
- · Water cooling
- · Undercutting
- · Wet drilling
- · Vacuum

#### **Building materials**

- · Natural stone (≥ 20mm)
- · Artificial concrete panels
- · Ceramics (≥ 10 mm)
- · Solid-surface materials

		Useable material	Drill bit	Drilling Tech- nology	Dimensions	Weight	Connections	Power input	Water con- sumption
Item	Item No.				[mm]	[kg]		[w]	
MB 2	061130	natural stone, ceramic	Diamond drill bit	Manual MB 2	190 x 290 x 600	30	230 V, 10/16 A	1000	1,5 L/min (idle running)

## Mobile drilling equipment BSN 101T

Drilling system for dry drilling using carbide cutters in façade panels, such as HPL and fibre cement.



#### **Advantages**

- · Easy handling
- · Economic construct undercut drill holes
- · Compact dimensions

#### **Functioning**

- · Carbide drilling fraises
- · Dry drilling
- · Undercutting
- · Vacuum

#### **Building materials**

- · Fibre cement
- · HPL panels
- · Thin panel materials (≥ 8 mm)

		Useable material	Drill bit	Drilling Tech- nology	Dimensions	Weight	Connections	Power input
Item	Item No.				[mm]	[kg]		[W]
BSN 101T	802484 1)	Thin panel mate- rials (e. g. HPL, fibre cement)	Carbide cutters	Manual MB 1	280 x 530 x 520	15	230 V, 10/16 A	1200

<sup>1)</sup> Supplied with one venturi nozzle #802111. Additionally a vacuum pump #802597 can be purchased.

### Side table BST

Supporting tables for drilling machines.



#### **Advantages**

- · Improves operating comfort
- · Work with larger panel formats
- · Enlarges the machine table surface

#### **Technical data**



BST 80

BST 502

		Dimensions	Weight	Number of rollers	Max. load (carnier roller)	Suitable for machine type
Item	Item No.	[mm]	[kg]		[N]	
BST 80	046228	800 x 480 x 780 (B x H x T)	20	5 pcs. Ø 50 x 390 mm	200	LBT 80
BST 502	046235	1000 x 1250 x 830 (B x H x T)	50	55 pcs. Ø 60 mm	200	SBN 502

## **Machine accessories**

Accessories for fischer undercut drilling machines.

#### Vacuum pump VP



		For machine type	Dimensions	Weight	Technical details
	Item No.		[mm]	[kg]	
Item					
Vacuum pump VP	802597	BSN 100, BSN 101 T	230 x 210 x 280 (B x T x H)	11	850 W, 230 V, 3,5 A, 50-60Hz

#### Venturi nozzle VD



		For machine type	Dimensions	Weight	Technical details
	Item No.		[mm]	[kg]	
Item					
Venturi nozzle VD	802111	BSN 100, BSN 101 T	120 x 60 x 20 (B x T x H)	0,1	

#### Vacuum cleaner SSG



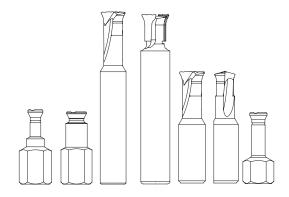
		For machine type	Dimensions	Weight	Technical details
	Item No.		[mm]	[kg]	
Item					
Vacuum cleaner SSG	802596	BSN 101 T	350 x 400 x 350 (B x T x H)	4	500 W, 230 V, 1,9-2,2 A, 60 Hz

## **Drill bits**

to ensure correct undercut drill hole geometry for fischer Zykon panel anchors.

Different materials require different types of drill bits. The appropriate drilling tool must be selected for each material and anchor combination. For example, a diamond drill bit with water cooling is used for natural

stone or ceramic panels. With carbide cutters, many other materials such as HPL and fibre cement can be drilled dry, without the need for water cooling.



### **Undercut drill bits**

Undercut drill bit for façade panels.



#### **Applications**

- · Interior façades
- · Exterior façades
- · Façade reveals

#### **Versions**

- · Diamond drill bit
- · Carbide drill bit

#### **Advantages**

· Simple creation of undercut drill holes for fischer-Zykon panel anchors.

#### **Building materials**

- · Natural stone (≥ 20mm)
- · Artificial concrete panels
- · Ceramics (≥ 10 mm)
- · Solid-surface materials
- · Fibre cement
- · HPL panels
- · Solid surfaces
- · Thin panel materials (≥ 8 mm)

#### **Technical data**







FZPB

FZPB 11/28

FZPB 11T D12

		Useable material	Drilling method	for BSN 100 VD & VP	for SBN 502 & LBT 80	for BSN 100T	Drill depth
	Item No.						[mm]
Item							
FZPB 9	060713	Natural stone	wet	_	FZP II M6	_	16
FZPB 9T	530910	ceramic	wet	_	FZP II T D40	_	16
FZPB 11	060710	Natural stone	wet	FZP II M6	FZP II M8, FZP II M6i	_	21
FZPB 11/28	092880	Natural stone	wet	FZP II M6	FZP II M8, FZP II M6i	_	28
FZPB 13	060711	Natural stone	wet	FZP II M8, FZP II M6i	FZP II M8i	_	21
FZPB 15	530908	Natural stone	wet		_	_	21
FZPB 11T D12	522402	Thin panel materials (e. g. HPL, fibre cement)	dry	_	_	FZP II T	10

### **Undercut drill bits CNC**

Creation of undercut holes for anchors using a CNC process.



#### **Applications**

- · Interior façades
- · Exterior façades
- · Façade reveals

#### **Versions**

- · Helix drilling
- · Single stage, direct drilling
- $\cdot\,$  Two-stage, direct drilling with pre-drilling

#### **Advantages**

- · Low investment costs
- Fast implementation of fischer undercut technology

#### **Building materials**

- · Natural stone (≥ 20mm)
- · Artificial concrete panels
- · Ceramics (≥ 10 mm)
- · Solid-surface materials
- · Fibre cement
- · HPL panels
- · Solid surfaces
- · Thin panel materials (≥ 8 mm)



FZPB FZPB CNC DIA

		Useable material	Drilling method	for CNC + adapter	Drill depth
					h <sub>0</sub>
	Item No.				[mm]
Item					
FZPB 11/21 CNC	535984 <sup>1)</sup>	natural stone, ceramic	wet	FZP II M6, FZP II T D40	21
FZPB 11/28 CNC	530911 <sup>1)</sup>	Natural stone	wet	FZP II M6	28
FZPB 13/21 CNC	535985 <sup>1)</sup>	Natural stone	wet	FZP II M8, FZP II M6i	21
FZPB 13/38 CNC	540698 <sup>1)</sup>	Natural stone	wet	FZP II M8, FZP II M6i	38
FZPB 15/28 CNC	547077 <sup>1)</sup>	Natural stone	wet	FZP II M8i	28
FZPB 11T CNC	522398	Thin panel materials (e. g. HPL, fibre cement)	dry	FZP II T	10
FZPB 11T CNC-DIA	541464	Thin panel materials (e. g. HPL, fibre cement)	dry	FZP II T	10
CNC adapter	804063	natural stone, ceramic	wet	FZP II M6, FZP II M8, FZP II M6i, FZP II M8i	_

<sup>1)</sup> if necessary the fischer CNC adapter #804063 (machine side: R  $1/2^{\circ}$ - $60^{\circ}$ ; drill bit side M14 thread) may be required

## **Undercut drill bits glass**

Creation of undercut holes in glass.



#### **Applications**

- · Glass façades
- · Interior façades
- · Exterior façades

#### **Versions**

· Helix drilling

#### **Advantages**

· Creation of undercut drill holes for fischer Zykon panel anchors in glass..

#### **Building materials**

- · Single layer safety glass (≥ 10mm)
- Laminated composite safety glass (≥ 18mm)
- · Glas ceramic



FZPB G

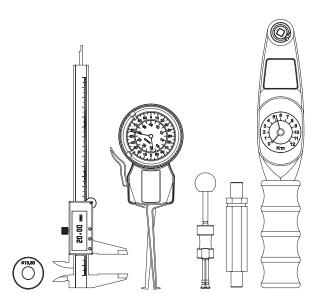
		Useable material	Drilling method	for CNC + adapter	Drill depth
	Item No.				h <sub>0</sub> [mm]
Item	1101111101				[]
FZPB 13 G6	019265	glass	wet	FZP G Z ESG, FZP G Z VSG	6
FZPB 13 G7	019266	glass	wet	FZP G Z ESG, FZP G Z VSG	7

# Testing and measuring equipment

for quality control of undercut holes for fischer Zykon panel anchors.

The safe and reliable function of the fixing system depends on various factors. An essential requirement is correctly drilled anchor holes and their quality control. The drill holes should be checked and recorded accor-

ding to the testing and setting guidelines as stipulated in the general technical approval.



## Testing and measuring equipment

Quality controlling for undercut drill holes.

#### Dial gauge for measuring the undercut diameter



Dial gauge STU

	Item No.	Useable material	FZP II M6	FZP II M8	FZP II M6 T	FZP II M6 T D40	FZP II M6i	FZP II M8i	FZP-G ESG	FZP-G VSG
Item										
STU 10 - 30	802506	all	•	•	•	•	•	•	•	•

#### Caliper for the measuring of the depth and cylindrical diameter of the drill hole



Analog caliper MST

Digital caliper MST-D

	Item No.	Useable material	FZP II M6	FZP II M8	FZP II M6 T	FZP II M6 T D40	FZP II M6i	FZP II M8i	FZP-G ESG	FZP-G VSG
Item										
MST	802575	all	•	•	•	•	•	•	•	•
MST-D	802507	all	•	•	•	•	•	•	•	•

#### Undercut volume gauge for checking the minimum undercut volume



Undercut volume gauge HVL

	Item No.	Useable material	FZP II M6	FZP II M8	FZP II M6 T	FZP II M6 T D40	FZP II M6i	FZP II M8i	
Item									
HVL 11	802333	natural stone, ceramic	•	_	_	•	_	_	
HVL 11T	802732	Fibre cement	_	_	•	_	_	_	
HVL 13	802337	Natural stone	_	•	_	_	•	_	
HVL 15	804186	Natural stone	_	_	_	_	_	•	

#### Diameter gauge for checking the cylindrical drill hole diameter



Diameter gauge DPL

Item	Item No.	Useable material	FZP II M6	FZP II M8	FZP II M6 T	FZP II M6 T D40	FZP II M6i	FZP II M8i	
Item									
DPL 11	802339	natural stone, ceramic	•	_	_	•	_	_	
DPL 11T	804089	Fibre cement	_	_	•	_	_	_	
DPL 13	802338	Natural stone	_	•	_	_	•	_	
DPL 15	804184	Natural stone	_	_	_	_	_	•	

#### **Accessories**





Torque wrench DMS

Adjustment ring ESR

	Item No.	Useable material	FZP II M6	FZP II M8	FZP II M6 T	FZP II M6 T D40	FZP II M6i	FZP II M8i	FZP-G ESG	FZP-G VSG
Item										
DMS 0,5 - 13,5 Nm	102863	all	•	•	•	•	•	•	•	•
ESR 13,5 - 15,5	802543	all	•	•	•	•	•	•	•	•

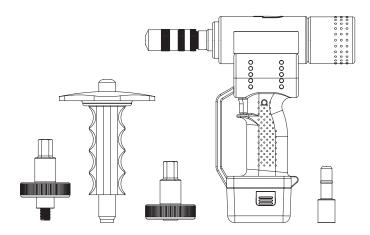


## **Setting tools**

for proper installation of fischer Zykon panel anchors.

The setting tools complete the overall fischer Zykon panel anchor fixing system. Based on years of experience, coordinated and revised with our customers, fischer offers a range of high-quality tools for simple,

fast and safe installation of the FZP II anchors. This is carried out according to the general technical approval relevant to the anchor and panel material combination.



## **Setting tools**

Installation of fischer Zykon panel anchors FZP II.

#### **Setting tools**





Battery operated setting tool SGB

Manual setting tool SGT

Item	Item No.	Useable material	FZP II M6	FZP II M8	FZP II M6 T	FZP II M6 T D40	FZP II M6i	FZP II M8i
SGB/110V	804097	Natural stone, thin panel materials (e. g. HPL, fibre cement)	•	•	•	•	•	•
SGB/230V	802522	Natural stone, thin panel materials (e. g. HPL, fibre cement)	•	•	•	•	•	•
SGT	802669	Natural stone, thin panel materials (e. g. HPL, fibre cement)	•	_	•	•	•	_

<sup>1)</sup> Dangerous goods - no express shipping possible.

#### **Setting adapter**





Setting adapter SGA M8

Setting adapter SGA M8i

	Item No.	Useable material	FZP II M6	FZP II M8	FZP II M8i	FZP II M6 T	FZP II M6 T D40	FZP-G ESG	FZP-G VSG	
Item										
SGA-M6	803749	natural stone, ceramic	•	_	_	•	•	_	_	
SGA-M8	803748	Natural stone	_	•	_	_	-	•	•	
SGA-M8i	804432	Natural stone	_	_	•	_	_	_	_	

<sup>1)</sup> for max. thread projection 18 mm

#### **Setting tool FZE plus**



Setting tool FZE plus

	Item No.	Useable material	FZP II M6	FZP II M6i	FZP II M8	FZP II M8i		
Item								
FZE 10 plus	044637	Natural stone	•	•	_	_		
FZE 12 plus	044638	Natural stone	-	_	•	_		
FZE 14 plus	044639	Natural stone	_	_	_	•		

<sup>1)</sup> Without centring pin.

<sup>2)</sup> for max. thread projection 16 mm



## 4

# SystemOne subframe system

Horizontal profiles	74	
Clasps	75	
Vertical profiles	77	
Wall holder	79	
Accessories	81	

## Subframe systems

SystemOne, SystemOne Light and SystemOne Vertical Solutions.

#### **SystemOne**

A key element of fischer façade systems is the System-One subframe. It is designed for high loads, large-sized, heavy natural stone slabs and for bridging non-load-bearing building structures. The subconstruction reduces assembly times on-site, reduces noise, e.g. during renovations, and allows easy replacement of panels. The combination of horizontal profiles and panel clasps results in a constant construction dimension of 37 mm.



#### SystemOne Light

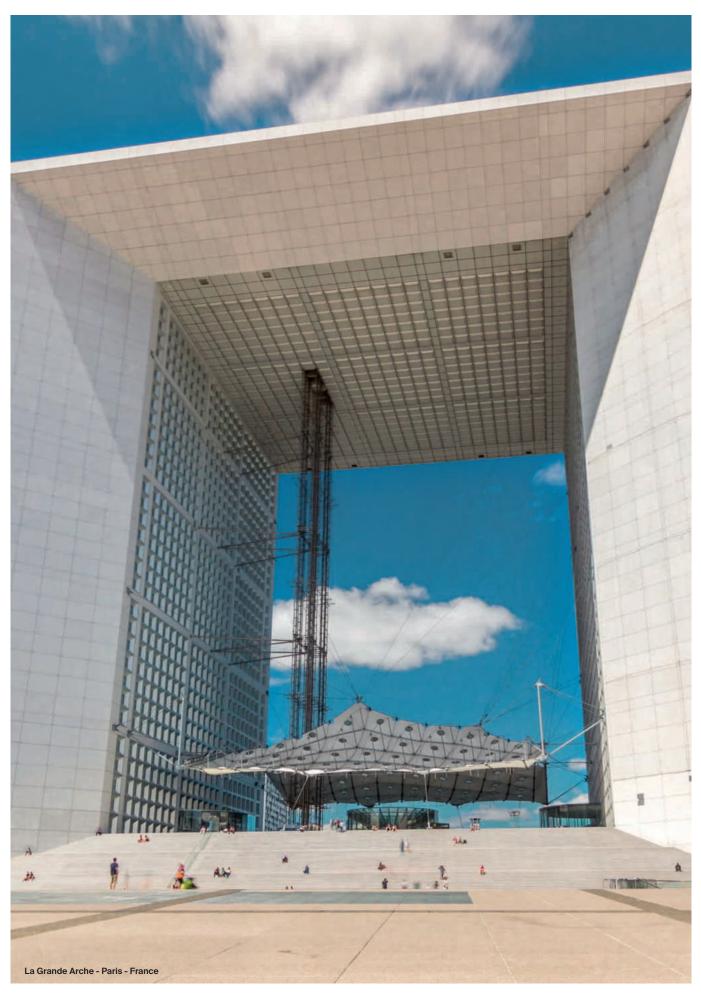
The fischer SystemOne Light façade system is the efficient solution when it comes to fast installation of rainscreen facades made of lightweight façade panels. The combination of horizontal profiles and panel clasps results in a constant construction dimension of 25 mm.



#### **SystemOne Vertical Solution**

A purely vertical subconstruction can be implemented with the fischer SystemOne Vertical Solution. With this system, the loads are transferred directly via the panel clasps mounted on the vertical profiles. For this system, the special Zykon FZP II VS panel anchors are used, which, thanks to the suspension nut, are hooked into the clasps according to the key lock principle. The use of the vertical solution results in a constant construction dimension of 15 mm.

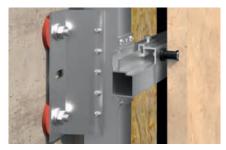




# **Horizontal profiles**

### Horizontal profile Bracket Solution





SystemOne in façade cross section with natural stone



SystemOne Light in façade cross section with natural stone

### **Applications**

As a horizontal profile for subframe systems in rainscreen facades

### **Versions**

- · HPBS
- · HP BSL

### **Advantages**

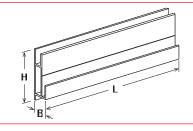
- Horizontal load bearing and transfer to the vertical profiles
- Quick and easily suspend façade panels thanks to the coordinated geometries of the brackets and horizontal profiles

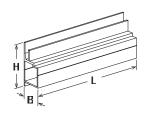
### **Functioning**

- · Geometric coordination
- · Horizontal load transfer







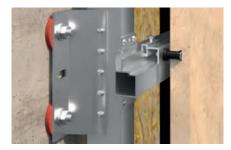


	Item No.	Length L [mm]	Width B [mm]	Height H [mm]	Sales unit [pcs]
Item					
HP-BSL	018438	6000	21	64	1
HP-BS	048899	6000	34	74	1

# Clasps

### **Clasps Bracket Solution**





SystemOne in façade cross section with natural stone



SystemOne Vertical Solution in façade cross section with natural stone

### **Applications**

 As a suspension element in the horizontal profile for subframe systems in rainscreen façades.

### **Versions**

- · BR-BS
- · BR-BSL
- · BR-VS

### **Advantages**

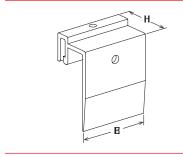
- · Clasps can be pre-assembled, saving time on the construction site.
- Fast and easy installation of façade panels thanks to the coordinated geometries of the clasps and horizontal profiles.

### **Functioning**

- · Geometric coordination
- · Load bearing



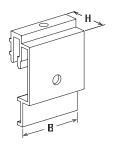
BR-BS



		Width B	Height H	Sales unit
	Item No.	[mm]	[mm]	[pcs]
Item				
BR-BS M6/50	048904	50	30	250
BR-BS M6/100	091536	100	30	125
BR-BS M8/50	049238	50	30	250
BR-BS M8/100	078585	100	30	125
BR-BS M8/150	078587	150	30	100



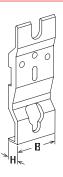
BR-BSL



		Width	Height	Sales unit
		В	Н	
	Item No.	[mm]	[mm]	[pcs]
Item				
BR-BSL 40-M6	018439	40	18	250
BR-BSL 40-M8	018448	40	18	250
BR-BSL 90-M8	018447	90	18	200



BR-VS



	Item No.	Width B [mm]	Height H [mm]	Sales unit [pcs]
Item				-
BR-VS 50-S	521663	50	15	20
BR-VS 50-F	521662	50	15	20

# **Vertical profiles**

### Box-section vertical profile





SystemOne in façade cross section with natural stone



SystemOne Vertical Solution in façade cross section with natural stone

### **Applications**

As a vertical profile for subframe systems in rainscreen facades

### **Versions**

- · VP
- Т

### **Advantages**

- Vertical box sections are better suited to absorb higher loads than T- or L-profiles, thanks to their closed geometry.
- · Better resistance to torsion.
- · Tolerance compensation for the substrate.
- · Simple geometry.

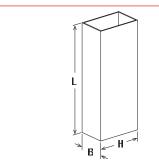
### **Functioning**

- · Vertical load transfer
- · Tolerance compensation

### **Technical data**



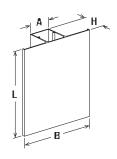
VP

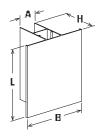


		Length	Width	Height	Sales unit
		L	В	Н	
	Item No.	[mm]	[mm]	[mm]	[pcs]
Item					
VP 25/2	018441	6000	50	25	1
VP 30/2	077545	6000	50	30	1
VP 40/2	077546	6000	50	40	1
VP 50/2	048895	6000	50	50	1
VP 80/2	048896	6000	50	80	1
VP 100/2	048897	6000	50	100	1
VP 120/3	048898	6000	50	120	1
VP 150/3	097884	6000	50	150	1
VP 180/3	097885	6000	50	180	1









		Length	Width A	Width	Height	Sales unit
		L	A	В	Н	
	Item No.	[mm]	[mm]	[mm]	[mm]	[pcs]
Item						
T60	077692	6000	50	180	60	1
T110	509279	6000	50	180	110	1

### **Wall brackets**

### Wall holder with fixing points on both sides





SystemOne in façade cross section with natural stone



SystemOne Vertical Solution in façade cross section with natural stone

### **Applications**

· As a wall holder for subframe systems in rainscreen facades

### **Versions**

- · FPH
- · SPH

### **Advantages**

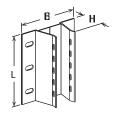
- The wall holder is used to absorb and transfer the loads applied to the façade system.
- They compensate the tolerance of the substrate.
- Available as fixed and sliding point anchors.
- Absorption of thermal longitudinal expansion through slots on the sliding point anchor.

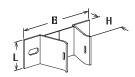
### **Functioning**

- · Vertical load transfer.
- Absorption of higher loads through double-sided attachment.
- Tolerance compensation for structural tolerances.
- · Easy installation with attachments on both sides.









FPH SPH

		Length	Width	Height	Slot	Match	Sales unit
		L	В	Н	Ixs		
	Item No.	[mm]	[mm]	[mm]	[mm]		[pcs]
Item							
FPH 30	018442	180	140	30	11 x 25	VP 50, VP 100	40
FPH 54	018444	180	160	54	11 x 25	VP 50, VP 100	40
FPH 68	048900	180	160	68	11 x 25	VP 50, VP 100	30
FPH 93	048901	180	160	93	11 x 25	VP 50, VP 100	20
FPH 133	030367	180	160	133	11 x 25	VP 50, VP 100	24
SPH 30	018443	60	140	30	11 x 25	VP 50, VP 100	100
SPH 54	018445	60	160	54	11 x 25	VP 50, VP 100	100
SPH 68	048902	60	160	68	11 x 25	VP 50, VP 100	90
SPH 93	048903	60	160	93	11 x 25	VP 50, VP 100	75
SPH 133	030368	60	160	133	11 x 25	VP 50, VP 100	50

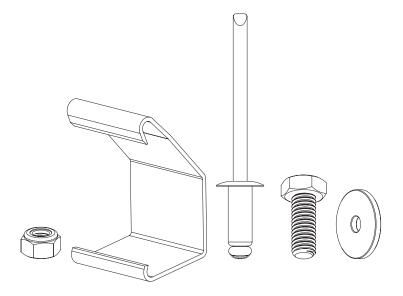
# Installation accessories

for the installation of fischer rainscreen façade systems.

The installation accessories include all components and elements which are required to assemble fischer façade systems as a rainscreen façade.

In addition to the usual fixings and connectors such

as screws, rivets and nuts, accessories for sub-frame systems and reveal angles for the design of façade corners are included.



### **Accessories**

Diverse assortment of accessories for installing a subframe system

### **Reveal angle LW**



-W 50

		Material	Adapted for	Length	Height	Width	Material thickness	Angle	Slot	Sales unit
				L	Н	В			lxs	
	Item No.			[mm]	[mm]	[mm]	[mm]		[mm]	[pcs]
Item										
LW 50-M6	078995	Aluminium	FZP II M6, FZP II M6 Carbon	80	80	50		90°	9 x 15	125
LW 50-M8	079148	Aluminium	FZP II M8, FZP II M8 Carbon	80	80	50		90°	11 x 17	125

### **Profile guidance GLB**



GLB

		Material	Adapted for	Length	Height	Material thickness	Sales unit
				L	Н		
	Item No.			[mm]	[mm]	[mm]	[pcs]
Item							
Profile guidance GLB	048906	PVC		50	27	3	200

### Fixit Plastic wedge to form a horizontal fixed point



Fixit

		Material	Length	Height	Material thickness	Sales unit
			L	Н		
	Item No.		[mm]	[mm]	[mm]	[pcs]
Item						
Fixit	048905	PVC	45	20		250

### HP-Clip = visual protection clip to cover the aluminium substructure in the panel joints



HP-Clip

		Material	Length	Height	Width	Material thickness	Sales unit
			L	Н	В		
	Item No.		[mm]	[mm]	[mm]	[mm]	[pcs]
Item							
Cover plate HP-Clip	096451	PVC	70	40	45	2	300

### **Thermal isolator CBS**



Cold bridge stop CBS

		Material	External-Ø	Internal diameter	Material thickness	Sales unit
			d	D		
	Item No.		[mm]	[mm]	[mm]	[pcs]
Item						
Cold Bridge Stopp CBS	092680	PVC	50	12,0	5	200

### Strip holder bracket solution



SH-BS

	Item No.	Material	Length L [mm]	Height H [mm]	Material thickness [mm]	Sales unit [pcs]
Item Strip holder bracket	079169	Aluminium	120	50	4	50
solution	0/0/00	Adminum	120	00	7	

### **Blind rivet**



Blind rivet A4

	Item No.	Material	External-Ø d [mm]	Length L [mm]	Sales unit [pcs]
Item					
Blind rivet 4.8 x 12 A4	521664	A4	4.8	12	500

### Façade self-tapping screw FABSA



Self-Drilling screw FABSA 23-A2

		Material	External-Ø	Diameter of washer	Length	Sales unit
			d		L	
	Item No.		[mm]	[mm]	[mm]	[pcs]
Item						
FABSA 23 5,5 x 38 A2 DS16	092379		5.5	16	38	500

### Façade screw FADI



Facade self-tapping screw FADI A-A2

Ī			Material	External-Ø	Diameter of washer	Length	Sales unit
				d		L	
		Item No.		[mm]	[mm]	[mm]	[pcs]
	Item						
	FADI A 6,5 x 32 A4 DS16	092123	A4	6.5	16	32	500

### Washer



Washer

		Material	Internal diameter	Width across nut	Height	DIN	Sales unit
			D	SW	Н		
	Item No.		[mm]	[mm]	[mm]		[pcs]
Item							
Washer M6-A4	523231	A4	6	10	1.6	125	100
Washer M8-A4	523232	A4	8	13	1.6	125	100

### Spike washer



Spike washer A4

		Material	Internal diameter	Length	Height H	Material thickness	Sales unit
Item	Item No.		[mm]	[mm]	[mm]	[mm]	[pcs]
Spike washer M6 - A4	049914	A4	6	20	20	3	100
Spike washer M8 - A4	049915	A4	8	20	20	3	100

### Nut A4







Hexagonal nut A4

Lock nut A4

Serrated Nut A4

		Material	Internal thread	Width across nut	Height	DIN		Sales unit
			A1	SW	Н			
	Item No.			[mm]	[mm]			[pcs]
Item								
Nut M6 A4	521667	A4	M 6	10	5.2	934	24 032	100
Nut M8 A4	521668	A4	M 8	13	6.8	934	24 032	100
Lock nut M6 A4	521669	A4	M 6	10	8	985	24 032	100
Lock nut M8 A4	521670	A4	M 8	13	9.5	985	24 032	100
Serrated Nut M6 A4	541613	A4	M 6	10	6	1661	6923	250
Serrated Nut M8 A4	541614	A4	M 8	13	8	1661	6923	250

### Screw locking liquid



Screw locking liquid

		Contents	Sales unit
	Item No.	[ml]	[pcs]
Item			
Screw locking liquid 10ml	521676	10	1

### **Profile connector**







PSV-BS

PSV-BSL

PSV-VS

	Item No.	Material	Length L [mm]	Height H [mm]	Width B [mm]	Material thickness [mm]	Sales unit [pcs]
Item							
PSV-BS	521665	Aluminium	200	30	30	2	25
PSV-BSL	018446	Aluminium	200	35	10	2	25
PSV-VS	049905	Aluminium	200	45	20	2	50

### 4

### **Adjustment screw**



ES-BS

		Material	External-Ø	Width across nut	Length	DIN	Sales unit
			d	SW	L		
	Item No.		[mm]	[mm]	[mm]		[pcs]
Item							
ES-BS	521673	A4	6	10	16	933	50
ES-BSL	521672	A4	6	10	14	933	50

### Adjustable wedge



Adjustable wedge

		Material	Sales unit
ltom	Item No.		[pcs]
Item			
Adjustable wedge VS	521675	PVC	5

### **Socket wrench**



Socket wrench with T-handle

		Internal thread	Width across nut	Sales unit
		A1	SW	
	Item No.		[mm]	[pcs]
Item				
Socket wrench SW10	802168	M 6	10	1
Socket wrench SW13	802169	M 8	13	1

### **Rivet setting tool**



NSG

		Sales unit
	Item No.	[pcs]
Item		
NSG (price)	046236 1)	1

<sup>1)</sup> Dangerous goods - no express shipping possible.



# 5

# Fixing systems and accessories

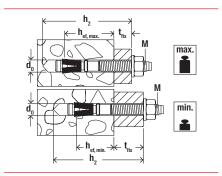
Steel fixings	88	
Chemical fixings	89	
Frame fixings	93	
Insulation fixings	94	<del>-</del>
Power tools	96	T

Mechanical anchoring solutions for heavy loads

### **Technical data**



Bolt anchor FAZ II



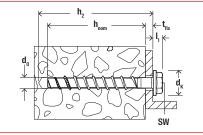
	Zinc-plated steel	Stainless steel	Appr	oval	Seismic-Ap- proval	Drill hole diameter	Min. drill hole depth for through fixings	Max. usable length hef,max./ hef,min.	Anchor length	Thread	Width across nut	Sales unit
						d <sub>0</sub>	h <sub>2</sub>	t <sub>fix</sub>	1	Ø x length	SW	
	Item No.	Item No.				[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[pcs]
Item	gvz	R	ETA	ICC								
FAZ II 8/10	094871 1)	501396 <sup>1)</sup>	•	•	C1	8	65	10/20	75	M 8 x 38	13	50
FAZ II 10/10	094981	501403	•	•	C1 / C2	10	85	10/30	95	M 10 x 53	17	50
FAZ II 10/20	094982	_	•	•	C1 / C2	10	95	20/40	105	M 10 x 63	17	25
FAZ II 10/20	_	501406	•	•	C1 / C2	10	95	20/40	105	M 10 x 63	17	50

<sup>1)</sup> With minimum embedment depth only for statically interdeterminate systems

### **Technical data**



ULTRACUT FBS II US - hexagon head with integral washer



		Approval	Drill hole diameter	Min. drill hole depth for through fixings	Screw	Screw-in depth with fixture thickness	Screw-in depth with fixture thickness	Screw-in depth with fixture thickness	Drive	Sales unit
			d <sub>O</sub>	h <sub>2</sub>	d <sub>a</sub> x I <sub>s</sub>	h <sub>nom1</sub> / t <sub>fix</sub>	h <sub>nom2</sub> / t <sub>fix</sub>	$h_{nom3}$ / $t_{fix}$		
	Item No.		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[pcs]
Item		ETA								
FBS II 8x80 30/15 US TX	536853	•	8	90	10 x 80	50/30	65 / 15	65 / 15	TX40/SW13	50
FBS II 8x90 40/25 US TX	536854	•	8	100	10 x 90	50 / 40	65 / 25	65 / 25	TX40/SW13	50
FBS II 8x100 50/35 US TX	536855	•	8	110	10 x 100	50/50	65 / 35	65 / 35	TX40/SW13	50
FBS II 10x70 15/5/- US	536859	•	10	80	12 x 70	55 / 15	65/5	-/-	SW 15	50
FBS II 10x80 25/15/- US	536860	•	10	90	12 x 80	55 / 25	65 / 15	-/-	SW 15	50
FBS II 10x100 45/35/15 US	536862	•	10	110	12 x 100	55 / 45	65 / 35	85 / 15	SW 15	50

# **Chemical fixings**

Chemical fixing solutions for heavy-duty fixings in concrete and masonry.

### **Technical data**



Injection mortar FIS HB 345 S Static mixer FIS MR Plus

		Approval	Languages on the cartridge	Scale unit	Contents	Sales unit
Item	Item No.	ETA				[pcs]
FIS HB 345 S	033211	•	DE, EN, FR, ES, NL, CS	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS MR Plus	545853	_	_	_	10 static mixer FIS MR Plus	10

<sup>1)</sup> incl. 2 static mixer per cartridge.

### **Technical data**

FHB II-P 10X10



FHB II-P 10 x 60

FHB II-PF 10 x 60

		Approval	Drill hole diameter	Drill hole depth	Anchorage depth	Match	Sales unit
	Item No.		d <sub>()</sub> [mm]	h <sub>0</sub> [mm]	h <sub>ef</sub>		[pcs]
Item		ETA					
FHB II-P 10 x 60	096847	•	10	75	60	FHB II-S M 10 x 60	10
FHB II-PF 10 x 60	500547	•	10	75	60	FHB II-S M 10 x 60	10



Highbond anchor FHB II-A S (short version)

	Zinc-plated steel	Stainless steel	Highly corrosion resistant steel	Approval	Drill hole diameter	Drill hole depth	Anchorage depth	Usable length	Thread	Width across nut	Sales unit
					$d_0$	h <sub>0</sub>	h <sub>ef</sub>	t <sub>fix</sub>	M	SW	
	Item No.	Item No.	Item No.		[mm]	[mm]	[mm]	[mm]		[mm]	[pcs]
Item	gvz	R	HCR	ETA							
FHB II-A S M10 x 60/10	097072	097630	097704 1)	•	10	75	60	10	M 10	17	10
FHB II-A S M10 x 60/20	097073	097631	097705 1)	•	10	75	60	20	M 10	17	10

<sup>1)</sup> Delivery time on request.





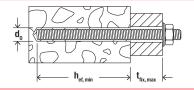
Injection mortar FIS V 360 S Static mixer FIS MR Plus

		Approv	al		Languages on the cartridge	Scale unit	Contents	Sales unit
	Item No.							[pcs]
Item		DIBt	ETA	ICC				
FIS V 360 S	094404	•	•	•	DE, FR, NL, TR, HU, AR	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS V 360 S	094405	•	•	•	EN, IT, PT, ES, ZH, JA	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS V 360 S	068435	•	•	•	DA, SV, NO, FI, PL, EL	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS V 360 S	043994	•	•	•	CS, SK, PL, HU, RO, RU	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS V 360 S	502283	•	•	•	LT, LV, ET, UK, RU, KK	180	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS MR Plus	545853	-	_	_	_	_	10 static mixer FIS MR Plus	10

### **Technical data in concrete**



Threaded rod FIS A

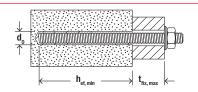


	Zinc plat- ed, steel grade 5.8	Stainless steel	Appr	oval	Drill hole diameter	Min. / max. anchorage depth	Min. / max. usable length	Min. / max. filling quantity	Sales unit
	Item No.	Item No.			d <sub>()</sub> [mm]	[mm]	[mm]	[scale units]	[pcs]
Item	gvz	R	ETA	ICC					
FIS A M 10 x 110	090278	090444	•	•	12	60/96	1/37	3/4	10

### Technical data in solid brick masonry



Threaded rod FIS A

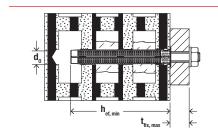


	Zinc plat- ed, steel grade 5.8	Stainless steel	Approval	Drill hole diameter	Min. effective anchorage depth acc. ETA	Max. effective length acc. ETA	Fill quantity for effect. anchoring depth	Sales unit
	Item No.	Item No.		d <sub>()</sub> [mm]	[mm]	[mm]	[scale units]	[pcs]
Item	gvz	R	ETA	[]	[]	[]	[coare armo]	[[600]
FIS A M 10 x 110	090278	090444	•	12	50	30	3	10

### 5

### Technical data in perforated brick masonry

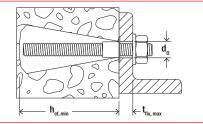




	Zinc plat- ed, steel grade 5.8	Stainless steel	Approval	Drill hole diameter in perforated brick masonry		Max. useful length in perforated brick masonry		Sales unit
				d <sub>o</sub>	h <sub>ef, min</sub>	t <sub>fix, max</sub>		
	Item No.	Item No.		[mm]	[mm]	[mm]		[pcs]
Item	gvz	R	ETA					
FIS A M 10 x 110	090278	090444	•	16	85	12	FIS H 16 x 85 K	10

### Technical data in undercut drill hole in aerated concrete

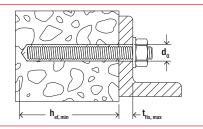




	Zinc plat- ed, steel grade 5.8	Stainless steel	Approval	Drill hole diameter in aerated con- crete in undercut drill hole	Min. / max. an- chorage depth in aerated concrete in undercut drill hole	Min. / max. usable length in aerated concrete	Filling quantity for min. / max. an- chorage depth in aerated concrete	Sales unit
	Item No.	Item No.		[mm]	h <sub>ef</sub> [mm]	t <sub>fix</sub> [mm]	[scale units]	[pcs]
Item	gvz	R	ETA					
FIS A M 10 x 110	090278	090444	•	14	75 / 95	22 / 2	15 / 20	10

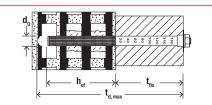
### Technical data in cylindrical drill hole in aerated concrete





	Zinc plat- ed, steel grade 5.8	Stainless steel	Approval	Drill hole diameter in aerated con- crete in cylindrical drill hole	Anchorage depth in aerated con- crete in cylindrical drill hole	Usable length	Fill quantity for effect, anchorage depth in aerated concrete	Sales unit
				d <sub>0</sub>	h <sub>ef</sub>	t <sub>fix</sub>		
	Item No.	Item No.		[mm]	[mm]	[mm]	[scale units]	[pcs]
Item	gvz	R	ETA					
FIS A M 10 x 110	090278	090444	•	12	100	_	_	10





		Approval	Drill hole diameter	Max. drill hole depth	Effect. anchorage depth	Max. fixture thickness	Match	Fill quantity	Sales unit
	Item No.		d <sub>()</sub> [mm]	[mm]	h <sub>ef</sub> [mm]	t fix [mm]		[scale units]	[pcs]
Item	gvz	ETA							
FIS H 16 x 85 K	041902	•	16	95	85	_	FIS A M8-M10, FIS E M6-M8	_	50

### **Technical data**

Cone drill PBB

Centring sleeve PBZ

		Approval	Match	Contents	Sales unit
Item	Item No.	ETA			[pcs]
Cone drill PBB	090634	•	M8 - M12; FIS E	1x cone drill PBB	1
Centring sleeve PBZ	090671	•	M8 - M12; FIS E	10x centring sleeve PBZ, 5x injection adapter	10

















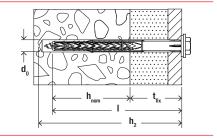


# Frame fixings

Secure fixing for façade substructures, interior fittings, window and door installation and timber construction

### **Technical data**

SXRL-FUS - with fischer hexagon head safety screw, moulded washer and integrated bit recess

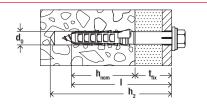


	Zinc-plated steel	Stainless steel	Appr	oval	Drill diam- eter	Min. drill hole depth for through fixings	Usable length at anchorage depth 50mm	Usable length at anchorage depth 70mm	Usable length at anchorage depth 90mm	Anchor length	Drive	Sales unit
					d0	h <sub>2</sub>	t <sub>fix</sub>	t <sub>fix</sub>	t <sub>fix</sub>	I		
	Item No.	Item No.			[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[pcs]
Item	gvz	A4	ETA	ICC								
SXRL 10 x 80 FUS	522719	522730	•	•	10	90	30	10	_	80	T40/SW13	50
SXRL 10 x 100 FUS	522720	522731	•	•	10	110	50	30	10	100	T40/SW13	50
SXRL 10 x 120 FUS	522721	522732	•	•	10	130	70	50	30	120	T40/SW13	50
SXRL 10 x 140 FUS	522723	522733	•	•	10	150	90	70	50	140	T40/SW13	50
SXRL 10 x 160 FUS	522724	522734	•	•	10	170	110	90	70	160	T40/SW13	50

### **Technical data**



SXR-FUS - with fischer hexagon head safety screw, moulded washer and integrated T40 bit recess



	Zinc-plated steel	Stainless steel	Approval	Drill hole diameter	Min. drill hole depth for through fixings	Min. anchorage depth	Anchor length	Max. fixture thickness	Drive	Sales unit
				d <sub>O</sub>	h <sub>2</sub>	h <sub>nom</sub>	1	t fix		
	Item No.	Item No.		[mm]	[mm]	[mm]	[mm]	[mm]		[pcs]
Item	gvz	A4	ETA							
SXR 10 x 60 FUS	046329	046339	•	10	70	50	60	10	T40/SW13	50
SXR 10 x 80 FUS	046330	046340	•	10	90	50	80	30	T40/SW13	50
SXR 10 x 100 FUS	046331	046342	•	10	110	50	100	50	T40/SW13	50
SXR 10 x 120 FUS	046332	046343	•	10	130	50	120	70	T40/SW13	50
SXR 10 x 140 FUS	046333	046344	•	10	150	50	140	90	T40/SW13	50
SXR 10 x 160 FUS	046334	046345	•	10	170	50	160	110	T40/SW13	50

# **Insulation fixings**

Fixing elements for fixing insulation boards

### **Technical data**



Insulation support DHK 45, plate-ø 45 mm

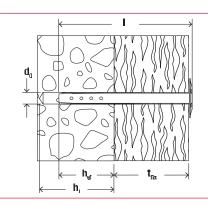
Insulation support DHK, plate-ø 90 mm

		Drill hole diameter	Min. drill hole depth	Effect. anchorage depth	Anchor length	Max. fixture thick- ness	Sales unit
		d <sub>0</sub>	h <sub>1</sub>	h <sub>ef</sub>	1	t fix	
	Item No.	[mm]	[mm]	[mm]	[mm]	[mm]	[pcs]
Item							
DHK 80	080939	8	30	20	105	80	250
DHK 100	080940	8	30	20	125	100	250
DHK 120	080941	8	30	20	145	120	200
DHK 140	080949	8	30	20	165	140	200
DHK 160	512150	8	30	20	185	160	100
DHK 180	512151	8	30	20	205	180	100
DHK 200	512153	8	30	20	225	200	100
DHK 220	512154	8	30	20	245	220	100

### **Technical data**



Insulation support metal DHM, washer-ø 35 mm



		Drill hole diameter	Min. drill hole depth	Effect. anchorage depth	Anchor length	Max. fixture thick- ness	Sales unit
		d <sub>O</sub>	h <sub>1</sub>	h <sub>ef</sub>	I	t fix	
	Item No.	[mm]	[mm]	[mm]	[mm]	[mm]	[pcs]
Item							
DHM 90	088803 1)	8	60	50	140	60 - 90	250
DHM 135	503131 1)	8	60	50	185	120 - 135	250
DHM 150	061582 1)	8	60	50	200	150	250
DHM 200	519317 <sup>1)</sup>	8	60	50	250	170 - 200	125
DHM 250	519318 <sup>1)</sup>	8	60	50	300	220 - 250	125

<sup>1)</sup> Fixing tapped into aerated concrete G2/G4 without pre-drilling.













HK 36 plastic	HV 36 zinc	ISO-disk 8/60	DI 60/10	DIM-A4	DIM 70/10

		Disc Ø	Disc height	Through hole	Steel sheet thickness	Sales unit
				$d_{f}$	S	
	Item No.	[mm]	[mm]	[mm]	[mm]	[pcs]
Item						
HV 36 zinc	004286	36	3.5	5	0,7	100
HK 36 plastic	004283	36	4.5	5	_	100
ISO-disk 8/60	001680	60	7	8	_	100
DT 60/10	044317	60	7	10	_	50
DT 90/4	080957 1)	90	9.3	4	_	250
DT 90/8	080958	90	9.3	8,2	_	250
DTM 60/10 A4	088805	60	3	10,5	0,5	100
DTM 70/10 zinc	044318	70	3	10,5	_	50

<sup>1)</sup> The central hole is adapted in such a way that the disc clamps well on the 4 mm wire of the VB walltie.

### **Power tools**

Professional electrical devices from a single source.

### **Assortment**





FSS 18V 400 BL

- Cordless impact wrench set

FSS 18V 600

- Cordless impact wrench set

		Belt hook			Test sleeves FUP for concrete screw diameter		Battery pack 4.0 Ah		Charger		Packaging L-Boxx, stackable
Item	ArtNo.	FSS BH	10 / 13 / 15	15 / 17 / 21	8 / 10	12 / 14	1x	2x	Type EU	Type UK	
FSS 18V 400 BL - Set 1	552922	•	•		•						•
FSS 18V 400 BL - Set 2	552924	•	•		•		•				•
FSS 18V 400 BL - Set 3	552926	•	•		•			•	•		•
FSS 18V 400 BL - Set 4	552928	•	•		•			•		•	•
FSS 18V 600 - Set 1	552923	•		•		•					•
FSS 18V 600 - Set 2	552925	•		•		•	•				•
FSS 18V 600 - Set 3	552927	•		•		•		•	•		•
FSS 18V 600 - Set 4	552929	•		•		•		•		•	•











Checking gauge FUP

Nut SW

Nut TX

FMB T40 Maxx Bit

Profi-bit FPB T50 5/16"

		Internal diameter	Drive	Match	Sales unit
		D			
	Item No.	[mm]			[pcs]
Item					
FUP 8	537200	9,9	_	FBS II 8	1
FUP 10	537201	12,0	_	FBS II 10	1
FUP 12	537202	13,0	_	FBS II 12	1
FUP 14	537203	15,0	_	FBS II 14	1
TX40	538575 1)	_	1/2" - 1/4"	FBS II 8 / FBS II 8 SK	1
TX50	538576 <sup>2)</sup>	_	1/2" - 5/16"	FBS II 10 / FBS II 10 SK	1
SW10	538577	_	_	FBS II 6	1
SW13	538578	_	1/2" / SW13	FBS II 8	1
SW15	538579	_	1/2" / SW15	FBS II 10	1
SW17	538580	_	1/2" / SW17	FBS II 12	1
SW21	538581	_	1/2" / SW21	FBS II 14	1
FMB T30 Maxx Bit W 5	533158	_	TX30	FBS II 6	1
FMB T40 Maxx Bit W 5	533159	_	TX40	FBS II 8 / FBS II 8 SK	1
FPB Profi-Bit T50 5/16"	538574	_	TX50	FBS II 10 SK	1

<sup>1)</sup> Suitable for FMB TX Maxx Bit

<sup>2)</sup> Suitable for FPB Profi-Bit T50 5/16"



Vacuum cleaner FVC 35 M

		Voltage	Max. power from suction cup to socket	Max. power	Max. volume flow	Negative pressure	Noise pressure	Contents	Weight	Dimensions
Item	ArtNo.	[V]	[Watt]	[Watt]	[l/s]	[mbar]	[dB (A)]		[kg]	[cm]
FVC 35 M	551924	220-240	2000 (220 - 240V~)	1400	73*	270*	69	1x Vaccum cleaner FVC 35 M, 1x Suction hose FVC SH, 2x Folded filter cartridges FVC FC, 1x Bag FVC PB	15,5	53 x 40 x 56 (Power cable length: 800)

<sup>\*</sup> Measured at motor head



Cleaning set FVC AP

		Adapted for	Material	Contents	Sales unit
Item	Item No.				[pcs]
FVC AP	552058	FVC 35 M	Plastic	1 x Hand tube with supplementary air slide, 30 cm long, Ø 35 mm 2 x Suction tube, 50 cm long, Ø 35 mm 1 x Floor nozzle, 30 cm broad, Ø 35 mm 1 x Crevice nozzle, 22 cm long, Ø 35 mm	1

### **Accessories**









Filter bag FVC FB

Bag FVC PB

Folded filter cartridges FVC FC

Suction hose FVC SH

Push handle FVC PH

		Adapted for	Material	Dimensions accessories	Contents	Sales unit
	Item No.					[pcs]
Item						
FVC FB	552059	FVC 35 M	Fleece	For 35 litre plastic container		1
FVC PB	552060	FVC 35 M	Polyethylene	For 35 litre plastic container		1
FVC FC	552061	FVC 35 M	Polyester	Filter surface 8600 cm2		1
FVC SH	552062	FVC 35 M	Polyethylene	Ø 35 mm, length 5 m		1
FVC PH	552063	FVC 35 M	Stainless steel	_		1



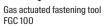
Detail: Top of drill FHD Ø 12 - 14 mm



Detail: Top of drill FHD Ø 16 - 18 mm Top of drill FHD Max Ø 16 - 35 mm

		Contents	Sales unit
Item	Item No.		[pcs]
FHD 12/200/330	546597	1	1
FHD 14/250/380	546598	1	1
FHD 16/250/380	546599	1	1
FHD 18/320/450	546600	1	1
FHD Max 16/400/620	546601	1	1
FHD Max 18/400/620	546602	1	1
FHD Max 20/400/620	546603	1	1
FHD Max 24/400/620	546604	1	1
FHD Max 28/600/820	546605	1	1
FHD Max 30/600/820	546606	1	1
FHD Max 35/650/870	546607	1	1







Battery charger FGC 100 - BC



Li-lon battery FGC 100-B 7.2 V - 2.5 Ah



XL-BOXX

		Contents	Technical details	Sales unit
Item	Item No.			[pcs]
Set FGC 100 (EU)	553411	1x fischer gas actuated fastening tool FGC 100, 1x Magazine FGC 100 – M26, 1x Battery charger FGC 100 – BC, 2x Li-lon battery FGC 100-B 7.2 V – 2.5 Ah, 1x Push bar, 2x Hex wrench, 1x XL-BOXX	100 joules setting energy, 4.1 kg with battery, Capacity of 26 nails, curved, Input 100 – 240 V, Output 8.4 V – 2 A, > 8,000 fixings per charge, For the clearance of jammed nails, - Is fully compatible with the L-BOXX	1
Set FGC 100 (UK)	553585	1x fischer gas actuated fastening tool FGC 100, 1x Magazine FGC 100 – M26, 1x Battery charger FGC 100 – BC, 2x Li-lon battery FGC 100-B 7.2 V – 2.5 Ah, 1x Push bar, 2x Hex wrench, 1x XL-BOXX	100 joules setting energy, 4.1 kg with battery, Capacity of 26 nails, curved, Input 100 – 240 V, Output 8.4 V – 2 A, > 8,000 fixings per charge, For the clearance of jammed nails, - Is fully compatible with the L-BOXX	1
Set FGC 100 (US)	553586	1x fischer gas actuated fastening tool FGC 100, 1x Magazine FGC 100 – M26, 1x Battery charger FGC 100 – BC, 2x Li-lon battery FGC 100-B 7.2 V – 2.5 Ah, 1x Push bar, 2x Hex wrench, 1x XL-BOXX	100 joules setting energy, 4.1 kg with battery, Capacity of 26 nails, curved, Input 100 – 240 V, Output 8.4 V – 2 A, > 8,000 fixings per charge, For the clearance of jammed nails, - Is fully compatible with the L-BOXX	1
Set FGC 100 (AUS)	553587	1x fischer gas actuated fastening tool FGC 100, 1x Magazine FGC 100 – M26, 1x Battery charger FGC 100 – BC, 2x Li-lon battery FGC 100-B 7.2 V – 2.5 Ah, 1x Push bar, 2x Hex wrench, 1x XL-BOXX	100 joules setting energy, 4.1 kg with battery, Capacity of 26 nails, curved, Input 100 – 240 V, Output 8.4 V – 2 A, > 8,000 fixings per charge, For the clearance of jammed nails, - Is fully compatible with the L-BOXX	1



Magazine standard FGC 100-M26



Magazine extended FGC 100-M50



Battery charger FGC 100 - BC



Li-lon battery FGC 100-B 7.2 V - 2.5 Ah

		Technical details	Sales unit
ltem	Item No.		[pcs]
Magazine standard FGC 100-M26	553412	Capacity of 26 nails, curved	1
Magazine extended FGC 100-M50	553717	Capacity of 50 nails, curved	1
Battery charger FGC 100-BC (EU)	553414	Input 100-240 V, Output 8.4 V – 2 A	1
Battery charger FGC 100-BC (UK)	553588	Input 100-240 V, Output 8.4 V – 2 A	1
Battery charger FGC 100-BC (US)	553589	Input 100-240 V, Output 8.4 V – 2 A	1
Battery charger FGC 100-BC (AUS)	553590	Input 100-240 V, Output 8.4 V – 2 A	1
Li-Ion battery FGC 100-B 7.2V 2.5Ah	553415	> 8,000 fixings per charge	1
FGC 100 Cleaning kit	553718	150 ml Cleaner, 100 ml Lubricating Oil and tool rubber sealing rings	1

### **Accessories**











Fuel cell FC 165 Standard nail DFN High performance nail DFNH EWI plug TFD

EWI nose FGC 100 - N EWI

Magnetic nose piece supplement FGC 100 – N magnetic

FC 165 D	FN		DFNH	TFD	FGC 100 - N EWI	ment FGC	100 – N magnetic
Item	Item No.	Length L [mm]	Technical details				Contents
Fuel cell FC 165	553416	165	For more than 1,100 f	ïxings			_
Standard nail DFN 17	553417	17	Gvz with 4 µm coating	g thickness, for soft concrete <	c C30/37, shaft diameter 2.6 mm, nail le	ngth 17 mm	1,008 nails + 1 fuel cell
Standard nail DFN 20	553418	20	Gvz with 4 µm coating	g thickness, for soft concrete <	: C30/37, shaft diameter 2.6 mm, nail le	ngth 20 mm	1,008 nails + 1 fuel cell
Standard nail DFN 22	553419	22	Gvz with 4 µm coating	g thickness, for soft concrete <	: C30/37, shaft diameter 2.6 mm, nail le	ngth 22 mm	1,008 nails + 1 fuel cell
Standard nail DFN 25	553420	25	Gvz with 4 µm coating	g thickness, for soft concrete <	: C30/37, shaft diameter 2.6 mm, nail le	ngth 25 mm	1,008 nails + 1 fuel cell
Standard nail DFN 30	553421	30	Gvz with 4 µm coating	g thickness, for soft concrete <	: C30/37, shaft diameter 2.6 mm, nail le	ngth 30 mm	1,008 nails + 1 fuel cell
Standard nail DFN 32	553422	32	Gvz with 4 µm coating	g thickness, for soft concrete <	: C30/37, shaft diameter 2.6 mm, nail le	ngth 32 mm	1,008 nails + 1 fuel cell
Standard nail DFN 35	553423	35	Gvz with 4 µm coating	g thickness, for soft concrete <	: C30/37, shaft diameter 2.6 mm, nail le	ngth 35 mm	1,008 nails + 1 fuel cell
Standard nail DFN 40	553424	40	Gvz with 4 µm coating	g thickness, for soft concrete <	: C30/37, shaft diameter 2.6 mm, nail le	ngth 40 mm	1,008 nails + 1 fuel cell
High performance nail DFNH 15	553425	15	Gvz with 4 µm coating nail length 15 mm	g thickness, for hard concrete a	≥ C30/37 and steel, shaft diameter 3.0	mm,	1,008 nails + 1 fuel cell
High performance nail DFNH 17	553426	17	Gvz with 4 µm coating nail length 17 mm	g thickness, for hard concrete ≥	≥ C30/37 and steel, shaft diameter 3.0	mm,	1,008 nails + 1 fuel cell
High performance nail DFNH 22	553427	22	Gvz with 4 µm coating nail length 22 mm	g thickness, for hard concrete a	≥ C30/37 and steel, shaft diameter 3.0	mm,	1,008 nails + 1 fuel cell
High performance nail DFNH 27	553428	27	Gvz with 4 µm coating nail length 27 mm	g thickness, for hard concrete	≥ C30/37 and steel, shaft diameter 3.0	mm,	1,008 nails + 1 fuel cell
High performance nail DFNH 32	553429	32	Gvz with 4 µm coating nail length 32 mm	g thickness, for hard concrete	≥ C30/37 and steel, shaft diameter 3.0	mm,	1,008 nails + 1 fuel cell
FGC 100-N EWI	554869	_	For the use of fischer	r EWI plugs TFD 30 and TFD 50			1
FGC 100-N magnetic	553715	_	For the use with meta	al washers			2





# 6 Basics – good to know.

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### Basic knowledge undercut anchors

# The secret of the concealed fixing solution.

The fischer façade system opens up the way for the design of advanced, complex façades - and all this in an easy and economic way. The reason lies in the system itself - FZP II, the fischer zykon panel anchor, which is an undercut anchor and therefore stress-free fixing

system that is installed into pre-drilled undercut holes. Internal reaction forces between anchor and material result not before the impact of external forces.

#### undercut drill hole





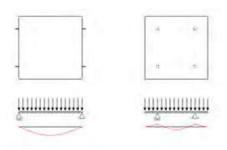
with external forces



Undercut hole and behaviour of the Zykon panel anchor FZP II with and without external force

The undercut anchors are installed on the back of the panel, not visible from the front side of the façade and cause a clean joint pattern. This also requires the possibility of optimized positioning of the anchor. As a result, the bending strength in the panel is reduced by approximately 50% compared to common systems. Compared to common fixings, this technology provides a multiple load capacity, allows lower panel thicknesses and larger panel formats due to lower panel bending moments.

Materials such as natural stone, ceramics, artificial stone, HPL, fibre cement, solid surface panels and also glass (ESG = toughened safety glass and VSG = laminated safety glass) can be fixed with the fischer FZP II undercut anchors in combination with the fischer subframe systems, providing architects with a wide range of scope of design.



Optimization of the bending moment of the façade panel; left diagram shows clamp or pin fixing, right diagram shows undercut fixing

The perfectly matching fischer façade systems with the undercut anchors, fitting subframe and advanced drilling technology pays off on the construction site: Installation is simple, fast and independent of the weather. The construction time is shortened - and therefore the costs are also reduced.

# Earthquake-proof façade systems.

The FZP II also proves its worth in situations with the highest demands on the fixing system.

Earthquake tests in Shanghai, China, impressively confirmed the outstanding performance of the undercut anchor. The various façade materials mounted with the FZP II withstood accelerations of up to 9.5 m/s2. This

corresponds to forces that cause considerable damage and destruction even in modern buildings designed for earthquakes.

These results have been confirmed by repeated tests in Italy and France.

# Various anchor types and installation methods.

There are two different installation methods for the fischer Zykon panel anchor FZP II:

### Flush installation

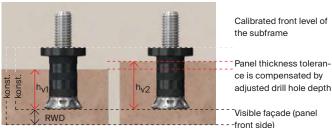
For flush installation, the installed anchor is flush with the back of the panel. The back of the panel is used as a reference for the constant drill hole depth.

### Stand-off installation

Thanks to the stand-off installation, the panel thickness tolerances that occur with natural stone panels can can be compensated. With this type of installation the the constant distance between the bottom of the drill hole and the front side of the panel, the remaining wall thickness (RWD), are used as the reference dimension. As a result, the drill hole depth becomes variable. Thanks to the use of the stand-off anchors the panel thickness tolerances can thus be compensated. This type of fixing is used, for example, for façade panels with panel thickness tolerances.



Flush installation of a fischer Zykon panel anchor FZP II.



Stand-off installation of a fischer Zykon panel anchor FZP II SO

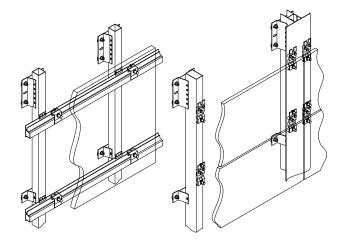


### Basic knowledge subframe systems

# Connection of the external wall and cladding.

The subframe is the structural link between the external wall and the cladding. It allows the compensation of the shell tolerances. Wall holders and vertical profiles are responsible for the adjustable part of the façade structure. The constant part of the façade construction is determined by the thickness of the façade material and the constant construction dimension of the selected subframe system. fischer offers various types of façade subframe systems.

The panel material, panel size and system loads play a decisive role in the selection of the subframe. Different façade cladding materials require different demands on a subframe, e.g. in terms of load-bearing capacity, design and installation.



Systematic wall construction fischer subframe system

Selection of the suitable subframe system depending on the facade material						
	Horizontal profiles with clasps	Horizontal profiles with clasps	Suspension clasps construction			
	Bracket Solution – BS	Bracket Solution Light – BSL	Vertical Solution – VS			
Natural stone	++	+	++			
Ceramics	0	+	0			
HPL	+	++	-			
Fiber cement	+	++	-			
Glass	+	+	+			

### The advantages at a glance

- · Quick assembly due to hook-in system
- · No visible fixing even in the joints
- · Designed for high loads
- · Bridging of non-load-bearing building fabric
- · Ideally suited for skeleton constructions
- · Mechanical fixing of reveal panels
- · Non-destructive replacement of façade panels



# **7**Service

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# Technical manual FireStop.

Products for use in passive fire protection.

The FireStop catalogue offers many facts and assists with fast and safe product selection, e.g:

- · Basics of passive fire protection
- · Product and system presentations
- · Application guides
- · Detailed technical data and drawings
- In short: Everything you need to know about the use of fischer passive fire protection systems

Don't wait. Ask for the technical manual FireStop under the hotline +49 (0) 180 5 202901 or by fax +49 (0) 7443 12 – 4500.



#### **Professional App**

# The mobile fixing consultant for the craftsman.



#### Online Catalogue

Inform yourself about all fischer products. You will also find relevant technical data and load values.



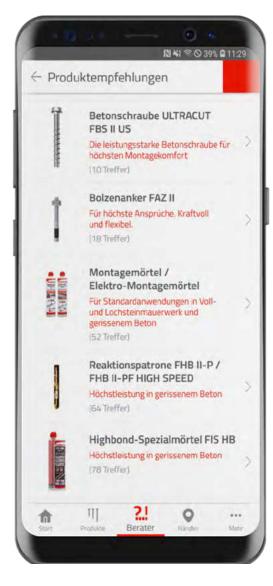
#### News

Here you will find all information about fischer - like product innovations or company highlights.

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#### Product advisor

Find the right fixing solution directly to your application.





#### Barcode scanner

Scan your product and you will receive all relevant information.
For example, for installation.



#### Live char

Benefit in direct contact from the many years of practical experience of the fischer engineers and technicians.



#### Dealer search

Find the dealer nearest you, which also offers your selected product in the assortment.







### Main catalogue Installation Systems.

Products for use in installation technology

All facts about the fischer installation systems.

- · Product and system presentations
- · Anchors suitable to fix installation system components
- · Application support
- · Detailed technical data and drawings
- · Basics knowledge of installation systems
- In short: Everything you need to know about the fischer installation systems

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### Main catalogue Fixing Systems.

Products for use in fixing technology

The fixing catalogue offers all facts and helps with quick and safe product selection, e.g.:

- · Product descriptions with advantages/benefits at a glance
- · Assembly tips
- · Application support
- · Detailed technical data and drawings
- · Basics knowledge of fixing technology
- · Everything you need to know about professional fixing

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used for a variety of applications. The new, modular structure of the program includes an engineering software and special application modules:



#### C-FIX:

The anchor dimensioning program for steel and composite anchors in concrete.



#### WOOD-FIX:

For the calculation of wood connections and reinforcements with fischer screws.



#### **INSTALL-FIX:**

The design program for building services.



#### **REBAR-FIX:**

For the design of subsequent reinforcement connections in reinforced concrete construction.



Download fischer FIXPERIENCE now for free: www.fischer.de/fixperience



#### **FACADE-FIX:**

To design the anchoring of Facade substructures made of wood.



#### RAIL-FIX:

To design the anchoring of Stair and balcony railings.



#### MORTAR-FIX:

To determine the injection mortar requirement for composite anchors in concrete.



#### Electronic planning folder:

All important documents and records from fischer in one program.

## Main catalogue Screws.

Products for use in timber construction

The screw catalogue offers many facts and helps with fast and safe product selection, for example:

- · Description of assortment
- · Load tables for construction screws
- · Detailed technical data

Don't wait. Require the main catalogue Screws at the Hotline +49 (0) 180 5 202901 or per fax to +49 (0) 7443 12 - 4500.



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Abbreviation	Item No.	Page	Abbreviation	Item No.	Page	Abbreviation	Item No.	Pag
Adjustable wedge VS	521675	85	FBS II 8x100 50/35 US TX	536855	88	FVC SH	552062	98
Battery charger FGC 100-BC (AUS)	553590	99	FBS II 8x80 30/15 US TX	536853	88	FZE 10 plus	044637	69
Battery charger FGC 100-BC (EU)	553414	99	FBS II 8x90 40/25 US TX	536854	88	FZE 12 plus	044638	69
Battery charger FGC 100-BC (UK)	553588	99	FGC 100 Cleaning kit	553718	99	FZE 14 plus	044639	69
Battery charger FGC 100-BC (US)	553589	99	FGC 100-N EWI	554869	100	FZP 13 x 30 M8//23 SH A4	521103	33
Blind rivet 4,8 x 12 A4	521664	82	FGC 100-N magnetic	553715	100	FZP 13 x 41 M8/S0/19 SH AL	521104	33
BR-BS M6/100	091536	75	FHB II-A S M10 x 60/10	097072	89	FZP 15 x 15,5 M8/16 G-Z	047300	47
BR-BS M6/50	048904	75	FHB II-A S M10 x 60/10 R	097630	89	FZP 15 x 15,5 M8/16 G-Z 6KT	051442	47
BR-BS M8/100	078585	75	FHB II-A S M10 x 60/10 HCR	097704	89	FZP 15 x 17,5 M8/14 G-Z	050407	47
BR-BS M8/150	078587	75	FHB II-A S M10 x 60/20	097073	89	FZP 15 x 17,5 M8/14 G-Z 6KT	051447	47
BR-BS M8/50	049238	75	FHB II-A S M10 x 60/20 R	097631	89	FZP 15 x 6 M8/11 G-Z	047254	45
BR-BSL 40-M6	018439	76	FHB II-A S M10 x 60/20 HCR	097705	89	FZP 15 x 6 M8/11 G-Z 6KT	051435	45
BR-BSL 40-M8	018448	76	FHB II-P 10 x 60	096847	89	FZP 15 x 6 M8/25 G-Z	047259	45
BR-BSL 90-M8	018447	76	FHB II-PF 10 x 60	500547	89	FZP 15 x 6 M8/25 G-Z 6KT	051436	45
BR-VS 50-F	521662	76	FHD 12/200/330	546597	98	FZP 15 x 7 M8/10 G-Z	047273	45
BR-VS 50-S	521663	76	FHD 14/250/380	546598	98	FZP 15 x 7 M8/10 G-Z 6KT	051440	45
BSN 100 VD	046223	53	FHD 16/250/380	546599	98	FZP 15 x 7 M8/24 G-Z	047274	45
BSN 100 VP	061502	53	FHD 18/320/450	546600	98	FZP 15 x 7 M8/24 G-Z 6KT	051441	45
BSN 101T	802484	57	FHD Max 16/400/620	546601	98	FZP II 11 x 10 M6/T/9 PA	520369	41
BST 502	046235	58	FHD Max 18/400/620	546602	98	FZP II 11 x 12 M6/13 A4	512131	23
BST 80			FHD Max 10/400/620		98			
	046228	58		546603		FZP II 11 x 12 M6/13 CARBON	511966	25
Centring sleeve PBZ	090671	92	FHD Max 24/400/620	546604	98	FZP II 11 x 12 M6/18 A4	512133	23
CNC adapter	804063	62	FHD Max 28/600/820	546605	98	FZP II 11 x 12 M6/18 CARBON	511967	25
Cold Bridge Stopp CBS	092680	82	FHD Max 30/600/820	546606	98	FZP II 11 x 15 M6/10 A4	512134	23
Cone drill PBB	090634	92	FHD Max 35/650/870	546607	98	FZP II 11 x 15 M6/10 CARBON	511968	25
Cover plate HP-Clip	096451	82	FIS A M 10 x 110	090278	90	FZP II 11 x 15 M6/18 A4	512135	23
DHK 100	080940	94	FIS A M 10 x 110	090278	91	FZP II 11 x 15 M6/18 CARBON	511969	25
DHK 120	080941	94	FIS A M 10 x 110	090278	91	FZP II 11 x 21 M6/S0/12 AL	512145	27
DHK 140	080949	94	FIS A M 10 x 110	090278	91	FZP II 11 x 21 M6/S0/12 CARBON	511978	29
DHK 160	512150	94	FIS A M 10 x 110	090278	90	FZP II 11 x 21 M6/S0/9 AL	512144	27
DHK 180	512151	94	FIS A M 10 x 110 R	090444	91	FZP II 11 x 21 M6/S0/9 CARBON	511977	29
DHK 200	512153	94	FIS A M 10 x 110 R	090444	91	FZP II 11 x 21 M6/VS/4 AL	512147	31
DHK 220	512154	94	FIS A M 10 x 110 R	090444	90	FZP II 11 x 6 M6/T/10 PA	520365	41
DHK 80	080939	94	FIS A M 10 x 110 R	090444	91	FZP II 11 x 6 M6/T/9 D40 PA	532644	43
DHM 135	503131	94	FIS A M 10 x 110 R	090444	90	FZP II 11 x 8 M6/T/10 D40 PA	532645	43
DHM 150	061582	94	FIS H 16 x 85 K	041902	92	FZP II 11 x 8 M6/T/12 PA	520367	41
DHM 200	519317	94	FIS HB 345 S	033211	89	FZP II 11 x 9 M6/T/9 D40 PA	532646	43
DHM 250	519318	94	FIS MR Plus	545853	90	FZP II 13 x 12 M6i	512958	37
DHM 90	088803	94	FIS MR Plus	545853	89	FZP II 13 x 15 M8/10 A4	512136	23
DMS 0,5 - 13,5 Nm	102863	66	FIS V 360 S	043994	90	FZP II 13 x 15 M8/10 CARBON	511970	25
DPL 11	802339	66	FIS V 360 S	068435	90	FZP II 13 x 15 M8/15 A4	512137	23
DPL 11T	804089		FIS V 360 S	094404	90	FZP II 13 x 15 M8/15 CARBON	511971	25
DPL 13	802338		FIS V 360 S	094405	90	FZP II 13 x 15 M8/23 A4	512138	23
DPL 15	804184	66	FIS V 360 S	502283	90	FZP II 13 x 15 M8/23 CARBON	511972	25
DT 60/10	044317	95	Fixit	048905	81	FZP II 13 x 15 M8/28 A4	512139	23
DT 90/4	080957	95	FMB T30 Maxx Bit W 5	533158	96	FZP II 13 x 15 M8/28 CARBON	511973	25
DT 90/8	080958		FMB T40 Maxx Bit W 5	533159	96	FZP II 13 x 17 M8/17 A4	512140	23
DTM 60/10 A4	088805		FPB Profi-Bit T50 5/16"	538574	96	FZP II 13 x 17 M8/17 CARBON	511980	25
DTM 70/10 zinc	044318	95	FPH 133	030367	79	FZP II 13 x 21 M8/17 A4	512142	23
ESR 13,5 - 15,5	802543	66	FPH 30	018442	79	FZP II 13 x 21 M8/17 CARBON	511975	25
ES-BS	521673	85	FPH 54	018444	79	FZP II 13 x 21 M8/22 A4	512143	23
ES-BSL	521672	85	FPH 68	048900		FZP II 13 x 21 M8/22 CARBON	511976	25
FABSA 23 5,5 x 38 A2 DS16	092379	83	FPH 93	048901	79	FZP II 13 x 21 M8/9 A4	512141	23
FADI A 6,5 x 32 A4 DS16	092123	83	FUP 10	537201	96	FZP II 13 x 21 M8/9 CARBON	511974	25
FAZ II 10/10	094981	88	FUP 12	537202	96	FZP II 13 x 26 M8/S0/12 AL	538088	27
FAZ II 10/10 R	501403	88	FUP 14	537203	96	FZP II 13 x 26 M8/S0/12 CARBON	538087	29
FAZ II 10/20	094982	88	FUP 8	537200	96	FZP II 13 x 26 M8/S0/17 AL	512146	27
FAZ II 10/20 R	501406	88	Fuel cell FC 165	553416	100	FZP II 13 x 26 M8/S0/17 CARBON	511979	29
FAZ II 8/10	094871	88	FVC AP	552058	97	FZP II 13 x 26 M8/VS/4 AL	512148	31
FAZ II 8/10 R	501396	88	FVC FB	552059	98	FZP II 13 x 30 M8/S0/13 AL	513226	27
FBS II 10x100 45/35/15 US	536862		FVC FC	552061	98	FZP II 13 x 30 M8/VS/4 AL	512149	31
FBS II 10x70 15/5/- US	536859	88	FVC PB	552060	98	FZP II 15 x 12 M8i	539478	35
	230303	88	FVC PH	552063	98	FZP II 15 x 15 M8i	539479	

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FZP II 15 x 21 M8i	540298	35	5
FZPB 11	060710	61	5
FZPB 11T CNC	522398	62	5
FZPB 11T CNC-DIA	541464	62	5
FZPB 11T D12	522402	61	5
FZPB 11/21 CNC	535984	62	5
FZPB 11/28	092880	61	8
FZPB 11/28 CNC	530911	62	5
FZPB 13	060711	61	8
FZPB 13 G6	019265	63	5
FZPB 13 G7	019266	63	5
FZPB 13/21 CNC	535985	62	5
FZPB 13/38 CNC	540698	62	5
FZPB 15	530908	61	5
FZPB 15/28 CNC	547077	62	8
FZPB 9	060713	61	5
FZPB 9T	530910	61	8
High performance nail DFNH 15	553425	100	9
High performance nail DFNH 17	553426	100	5
High performance nail DFNH 22	553427	100	\$
High performance nail DFNH 27	553428	100	8
High performance nail DFNH 32	553429	100	8
HK 36 plastic	004283	95	8
HP-BS	048899	74	9
HP-BSL	018438	74	8
HV 36 zinc	004286	95	\$
HVL 11	802333	65	5
HVL 11T	802732	65	5
HVL 13 HVL 15	802337 804186	65	8
ISO-disk 8/60	001680	65 05	5
LBT 80	046225	95 55	5
Li-lon battery FGC 100-B 7.2V 2.5Ah	553415	99	5
Lock nut M6 A4	521669	84	5
Lock nut M8 A4	521670	84	5
LW 50-M6	078995	81	
LW 50-M8	079148	81	
Magazine extended FGC 100-M50	553717	99	
Magazine standard FGC 100-M26	553412	99	
MB 2	061130	56	9
MST	802575	65	
MST-D	802507	65	5
NSG (price)	046236	85	5
Nut M6 A4	521667	84	5
Nut M8 A4	521668	84	5
Profile guidance GLB	048906	81	5
PSV-BS	521665	84	1
PSV-BSL	018446	84	1
PSV-VS	049905	84	1
SBN 502	061500	54	1
Screw locking liquid 10ml	521676	84	1
Serrated Nut M6 A4	541613	84	1
Serrated Nut M8 A4	541614	84	1
Set FGC 100 (AUS)	553587	99	1
Set FGC 100 (EU)	553411	99	1
Set FGC 100 (UK)	553585	99	١
Set FGC 100 (US)	553586	99	١
SGA-M6	803749	69	١
SGA-M8	803748	69	١
SGA-M8i	804432	69	١
SGB/110V	804097	69	١
SGB/230V	802522	69	١
SGT	802669	69	١

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Socket wrench SW10	802168	85
Socket wrench SW13	802169	85
SPH 133	030368	79
SPH 30	018443	79
SPH 54	018445	79
SPH 68	048902	79
SPH 93	048903	79
Spike washer M6 - A4	049914	83
Spike washer M8 - A4	049915	83
STU 10 - 30	802506	65
Standard nail DFN 17	553417	100
Standard nail DFN 20	553418	100
Standard nail DFN 22	553419	100
Standard nail DFN 25	553420	100
Standard nail DFN 30	553421	100
Standard nail DFN 32	553422	100
Standard nail DFN 35	553423	100
Standard nail DFN 40	553424	100
Strip holder bracket solution	079169	82
SW10	538577	96
SW13	538578	96
SW15	538579	96
SW17	538580	96
SW21	538581	96
SXR 10 x 100 FUS	046331	93
SXR 10 x 100 FUS A4	046342	93
SXR 10 x 120 FUS	046332	93
SXR 10 x 120 FUS A4	046343	93
SXR 10 x 140 FUS	046333	93
SXR 10 x 140 FUS A4	046344	93
SXR 10 x 140 FUS	046334	93
SXR 10 x 160 FUS A4	046345	93
SXR 10 x 60 FUS	046329	93
SXR 10 x 60 FUS A4	046329	93
SXR 10 x 80 FUS	046339	93
SXR 10 x 80 FUS A4	046340	93
SXRL 10 x 100 FUS SXRI 10 x 100 FUS A4	522720 522731	93
5/11.2 10 X 100 1 00 // 1	022.0.	00
SXRL 10 x 120 FUS	522721	93
SXRL 10 x 120 FUS A4	522732	93
SXRL 10 x 140 FUS	522723	93
SXRL 10 x 140 FUS A4	522733	93
SXRL 10 x 160 FUS	522724	93
SXRL 10 x 160 FUS A4	522734	93
SXRL 10 x 80 FUS	522719	93
SXRL 10 x 80 FUS A4	522730	93
T60	077692	78
T110	509279	78
Tergo+ 11 x 10 M6/T/9 PA	532643	39
Tergo+ 11 x 6 M6/T/10 PA	532641	39
Tergo+ 11 x 6 M6/T/13 PA	532642	39
Tergo+ 11 x 8 M6/T/10 PA	537974	39
Tergo+ 11 x 8 M6/T/13 PA	537975	39
TX40	538575	96
TX50	538576	96
Vacuum cleaner SSG	802596	59
Vacuum pump VP	802597	59
Venturi nozzle VD	802111	59
VP 100/2	048897	77
VP 120/3	048898	77
VP 150/3	097884	77
VP 180/3	097885	77
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VP 30/2	077545	77
VP 40/2	077546	77
VP 50/2	048895	77
VP 80/2	048896	77
Washer M6-A4	523231	83
Washer M8-A4	523232	83

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04283	95	051435	45	500547	89	521675	85	546600	98
04286	95	051436	45	501396	88	521676	84	546601	98
18438	74	051440	45	501403	88	522398	62	546602	98
18439	76	051441	45	501406	88	522402	61	546603	98
18441	77	051442	47	502283	90	522719	93	546604	98
18442	79	051447	47	503131	94	522720	93	546605	98
18443	79	060710	61	509279	78	522721	93	546606	98
)18444	79	060711	61	511966	25	522723	93	546607	98
18445	79	060713	61	511967	25	522724	93	547077	62
18446	84	061130	56	511968	25	522730	93	552058	97
18447	76	061500	54	511969	25	522731	93	552059	98
18448	76	061502	53	511970	25	522732	93	552060	98
19265	63	061582	94	511971	25	522733	93	552061	98
019266	63	068435	90	511972	25	522734	93	552062	98
30367	79	077545	77	511973	25	523231	83	552063	98
30368	79	077546	77	511974	25	523232	83	553411	99
33211	89	077692	78	511975	25	530908	61	553412	99
41902	92	078585	75	511976	25	530910	61	553414	99
143994	90	078587	75	511977	29	530911	62	553415	99
)44317	95	078995	81	511978	29	532641	39	553416	100
044318	95	079148	81	511979	29	532642	39	553417	100
044637	69	079169	82	511980	25	532643	39	553418	100
044638	69	080939	94	512131	23	532644	43	553419	100
044639	69	080940	94	512133	23	532645	43	553420	100
046223	53	080941	94	512134	23	532646	43	553421	100
)46225	55	080949	94	512135	23	533158	96	553422	100
046228	58	080957	95	512136	23	533159	96	553423	100
046235	58	080958	95	512137	23	535984	62	553424	100
046236	85	088803	94	512138	23	535985	62	553425	100
046329	93	088805	95	512139	23	536853	88	553426	100
046330	93	090278	91	512140	23	536854	88	553427	100
046331	93	090278	91	512141	23	536855	88	553428	100
046332	93	090278	90	512142	23	536859	88	553429	100
046333	93	090278	91	512143	23	536860	88	553585	99
046334	93	090278	90	512144	27	536862	88	553586	99
046339	93	090444	91	512145	27	537200	96	553587	99
046340	93	090444	91	512146	27	537201	96	553588	99
046342	93	090444	91	512147	31	537202	96	553589	99
046343	93	090444	90	512148	31	537203	96	553590	99
046344	93	090444	90	512149	31	537974	39	553715	100
046345	93	090634	92	512150	94	537975	39	553717	99
047254	45	090671	92	512151	94	538087	29	553718	99
047259	45	091536	75	512153	94	538088	27	554869	100
047273	45	092123	83	512154	94	538574	96	802111	59
)47274	45	092379	83	512958	37	538575	96	802168	85
047300	47	092680	82	513226	27	538576	96	802169	85
048895	77	092880	61	519317	94	538577	96	802333	65
048896	77	094404	90	519318	94	538578	96	802337	65
048897	77	094405	90	520365	41	538579	96	802338	66
048898	77	094871	88	520367	41	538580	96	802339	66
048899	74	094981	88	520369	41	538581	96	802484	57
48900	79	094982	88	521103	33	539478	35	802506	65
148901	79	096451	82	521104	33	539479	35	802507	65
148902	79	096847	89	521662	76	540298	35	802543	66
148903	79	090047	89	521663	76	540698	62	802575	65
)48904	75	097072	89	521664	82	541464	62	802596	59
)48905	81	097630	89	521665	84	541613	84	802597	59
)48906	81	097631	89	521667	84	541614	84	802669	69
)49238					84				
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