



TECHNOLOGY MANUAL

Anchor Fastening

Version December 2025



Foreword



Dear customer,

As it is our ambition to be the worldwide leader in fastening technology and related structural and non-structural connections, we are continuously striving to provide you with state-of-the-art technical information reflecting the latest development in codes, regulations, and approvals as well as technical information for our products.

The 'Fastening Technology Manual' is the gateway to technical documents for post-installed anchoring as well as cast-in anchors and channels. It reflects our ongoing investment into long-term research and development of leading fastening products.

While the selection and detailed design of our solutions has largely moved to digital means, i.e. using our design software PROFIS Engineering or the Hilti webpages, the Fastening Technology Manual is still a very valuable tool when solving fastening tasks and looking up technical details. It guides you through the complex world of Applications, Code Landscape, and wide variety of fastener products, provide you with profound technical know-how and help you to be more productive in your daily work without any compromise regarding reliability and safety.

We are available at any time to answer additional questions that go beyond this content.

Dr. Lars Taenzer
Business Unit Anchors



Important notices

- 1) The technical data presented in the Product Technical Data Sheets (PDS) linked to this Anchor Fastening Technology Manual is based on numerous tests and evaluation criteria according to the current state of the art and the relevant European regulations.
- 2) For all those anchors holding a European Technical Assessment (ETA), the technical data given in the PDS is based on and is in accordance with the information given in the respective ETA. The relevant ETA is listed in the certificates with a link to the document. Additional Hilti technical data may be available and will be noted on footnotes and/or tables.
- 3) For all those anchors not holding an ETA, the technical data given in the PDS is based on numerous tests and evaluation criteria according to the current state of the art and/or the relevant European applicable regulations for the assessment of fasteners, which are the basis for obtaining an ETA.
- 4) In addition to the tests for different loading conditions considered by the ETA, in some cases, tests have been performed following local guidelines, e.g., to assess the resistance to fatigue, fire and shock. In such cases national approvals, industrial certificates or expert reports are referenced in the applicable PDS.
- 5) The data and values are based on tests under laboratory or other controlled conditions, or on generally accepted methodology. It is the customer's responsibility to use the provided data taking into account the local conditions and to consider the intended use of the respective products. The customer must check that the listed prerequisites and criteria conform with the conditions existing on the jobsite. Whilst Hilti can give general guidance and advice, the nature of Hilti products means that the ultimate responsibility for selecting the right product for a particular application must lie with the customer.
- 6) Technical data presented herein was current as of the date of publication (see cover sheet of each linked PDS). Hilti's policy is one of continuous development. We therefore reserve the right to alter technical data and specifications, etc. without notice.
- 7) The given technical data in each PDS are valid for the service conditions indicated. Due to variations in local base materials, on-site testing may be required to determine or confirm the performance at any specific jobsite. If the base material is not found to be suitable for the scope of the published technical data of the selected product, contact the Engineering Competence Center of your local Hilti organization for further assistance.
- 8) instructions for use published by Hilti. The actual documents can be found using the links provided in the installation instructions table of each PDS.
- 9) The Product Technical Data Sheet (PDS) selectors contain extensive information on fastening types, substrates, installation methods, and load types. Each PDS and its linked documents provide the necessary details on which combinations have been tested and approved.
- 10) All product deliveries and advisory services are subject to the terms and conditions of the relevant local Hilti organization.
- 11) While reasonable efforts have been made to ensure the accuracy and completeness of the information provided, no guarantee is given as to its freedom from errors. Hilti shall not, under any circumstances, be held liable for any direct, indirect, incidental, consequential, or other damage, losses, or expenses arising from or in connection with the use of, or inability to use, the products or information for any purpose. Any implied warranties of merchantability or fitness for a particular purpose are expressly disclaimed.

Hilti Corporation
FL-9494 Schaan
Principality of Liechtenstein

Table of contents



1. Applications	05
1.1. Steel-to-concrete connections (post-installed anchors)	07
1.1.1 Images of applications	07
1.1.2 Product technical data sheet selector	09
1.1.3 Handbooks, articles and design software	11
1.2. Concrete-to-concrete connections and strengthening (post installed anchors)	13
1.2.1 Images of applications	13
1.2.2 Product technical data sheet selector	15
1.2.3 Handbooks, articles and design software	16
1.3. Steel-to-masonry connections (post installed anchors)	18
1.3.1 Images of applications	18
1.3.2 Product technical data sheet selector	19
1.3.3 Design software	20
1.4. Steel-to-concrete connections (cast-in systems)	21
1.4.1 Images of applications	21
1.4.2 Product technical data sheet selector	22
1.4.3 Handbooks, articles and design software	23
2. Code landscape	24
2.1. Qualification and design	24



1. Applications

Anchors @ Hilti Online



Engineering Center

Engineering center is the platform for customer and designer to get more information about structural connections. It is available 24/7 and give you access to: technical data, technical articles, CAD/BIM details, education & learning (Webinars, How-to videos and E-learning) design software PROFIS and Ask Hilti.



Ask Hilti

Get answers to all your engineering questions. Ask Hilti is an online community offering collaborative environment and experts advice to construction engineers and architects. Ask Hilti is part of Engineering Center and available 24/7.

Main information



Corrosion handbook

This handbook helps in raising your general awareness of everything about corrosion. It provides you with essential information on causes and types of corrosion, its behavior and assessment procedures as well as the materials used to protect metallic products.

[View online](#)

Supporting information



Possibilities and limitations of on-site anchor testing

This expert article for engineers discusses and explains why and under which conditions on-site testing of anchors can be useful, and the advantages of using Hilti's on-site testing service with some jobsite case studies.

[View online](#)



On-site anchor testing under tensile loads

This article for engineers and project managers list tips and tricks to support execution and assessment of On-Site Anchor testing.

[View online](#)



Hilti Academy for engineering e-learnings



Steel-to-concrete connection

Dive into the fundamentals of engineering with our focused e-learnings on steel-to-concrete connections. Learn the essential techniques, from anchor design to load transfer principles, ensuring durable and safe structures. Whether you're a beginner or looking to refine your expertise, the course modules on Hilti Academy equip you with the right knowledge. Ready to build stronger connections?

[View online](#)



Baseplate design optimization

Discover how Hilti's Value Engineering for baseplate design optimization and PROFIS Engineering software can transform your projects. This course equips structural engineers to reduce costs, enhance efficiency and improve outcomes by leveraging Smart Design technology for anchor selection and base plate optimization. Unlock smarter, faster, and more cost-effective solutions with Hilti.

[View online](#)



Concrete-to-concrete connection

Discover the essentials of concrete-to-concrete connections, from joint design to load transfer techniques. The specific e-learning modules equip you with the tools to create seamless, durable structures with confidence.

[View online](#)

Design software



PROFIS Engineering Suite

PROFIS Engineering is a one-stop tool for designing structural connections to leverage efficiency and productivity. It consists of several modules, e.g., concrete-to-concrete, steel-to-concrete, steel-to-masonry. It uses state-of-the-art and code compliant design methods in an illustrated 3D and 2D user interface environment.

[View online](#)



1.1. Steel-to-concrete connections (post-installed anchors)

The connection between structural (beams, columns, plates, brackets etc.) and non-structural (railings, facades, mechanical supports, fencing etc.) steel sections to existing concrete members cast at a previous point in time is called steel-to-concrete (S2C) post-installed connections. These connections are typically used for structural modifications,

retrofitting existing structures and light fixtures for architectural or secondary applications. S2C connections provide essential support in both new or retrofitting applications allowing flexibility, strength and durability.

1.1.1 Images of applications

Steel-to-concrete connections (post-installed anchors)

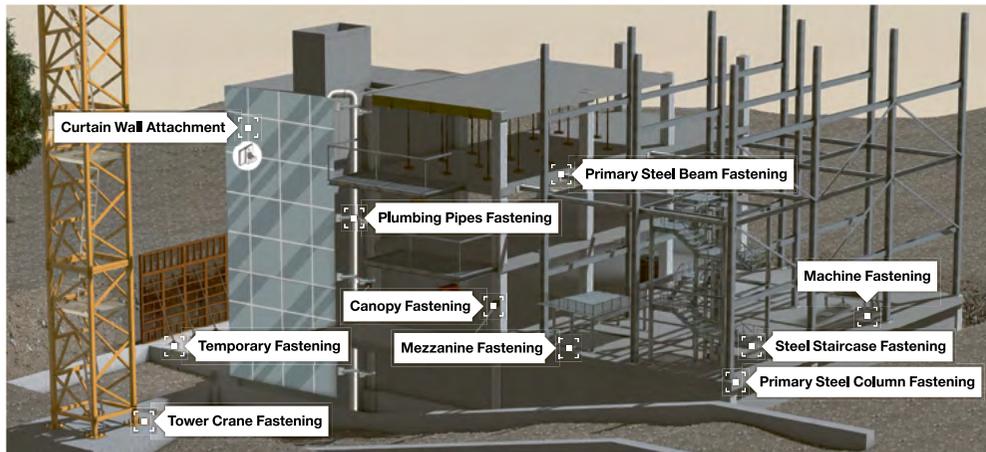


Illustration of typical applications in a building under construction

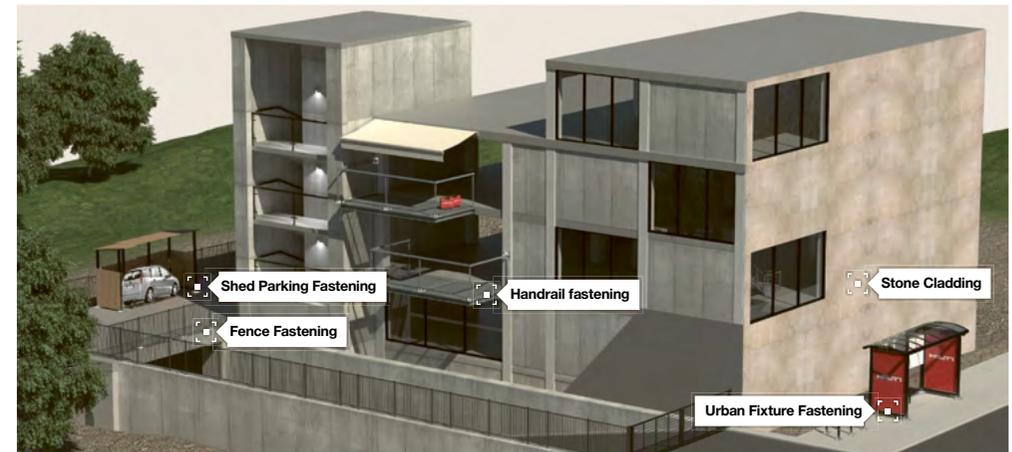
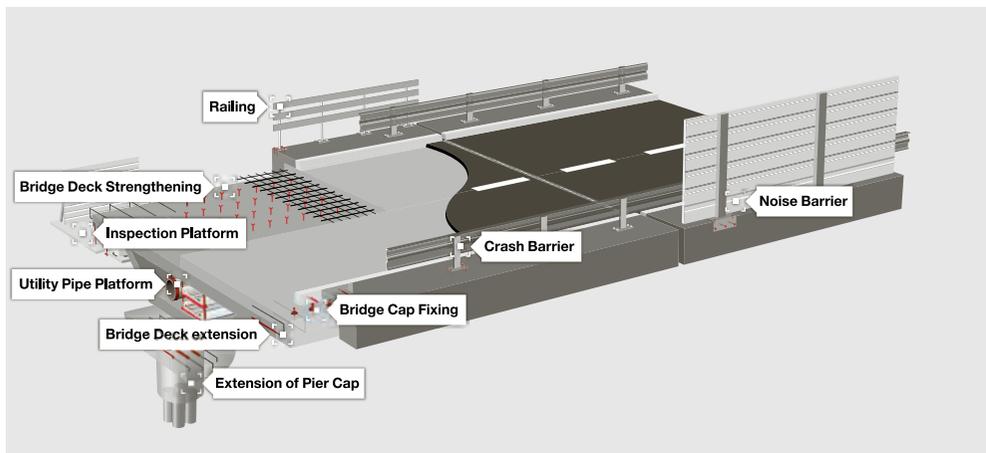


Illustration of typical applications for building finishings



Illustrations of typical applications for jobsite bridges

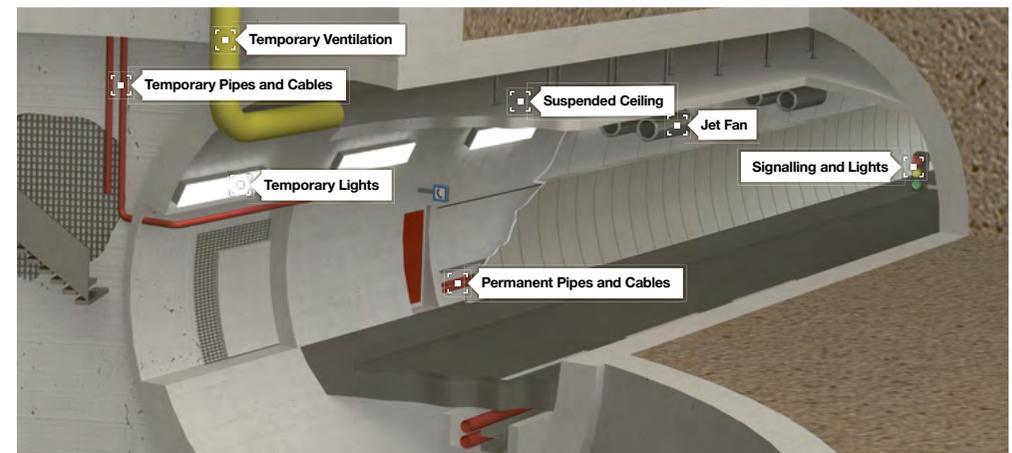


Illustration of typical applications for tunnel structures



1.1.1 Images of applications

Steel-to-concrete connections (post-installed anchors)



Primary steel column



Primary steel beam



Canopies



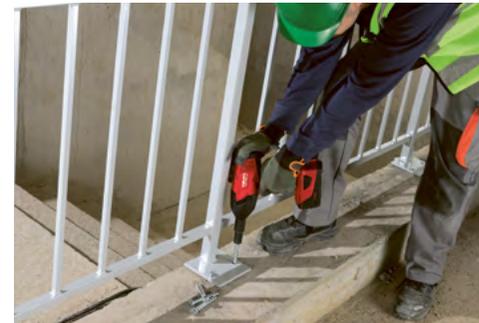
Steel staircase



Temporary wall support



Tower crane support



Handrails



Seats in stadium



1.1.2 Product technical data sheet selector: chemical anchors

[View detailed PDS selector](#)

Steel-to-concrete connections (post-installed anchors)

	Link to product technical data sheet (PDS)	Product picture	Fastener type				Base material		Setting		Design app
			Threaded rod HAS (U)	Internal threaded sleeve HIS-N HIT-IC	Expansion threaded rod HIT-Z HAS-D HIT-CS-F	Rebar	Cracked concrete	Uncracked concrete	Fast cure @ 20°C	Slow cure @ 20°C	PROFIS Engineering
Injection system	HIT-HY 200-R V3		✓	✓	✓	✓	✓	✓	✓		✓
	HIT-HY 200-A V3		✓	✓	✓	✓	✓	✓	✓		✓
	HIT-RE 500 V4		✓	✓		✓	✓			✓	✓
	HIT-RE 500 V3		✓	✓		✓	✓			✓	✓
	HIT-RE 100		✓			✓	✓			✓	✓
	HIT-HY 170		✓	✓	✓	✓	✓	✓			✓
	HIT-CT 100		✓				✓	✓	✓		✓
	HIT-MM Plus		✓	✓		✓		✓			
	HIT-RE 10		✓			✓				✓	
	HIT-ICE		✓	✓		✓	✓	✓	✓		✓
	HIT-1		✓					✓	✓		
Capsule system	HVU2		✓	✓			✓	✓	✓		✓
	HVU-TZ				✓		✓	✓	✓		✓



1.1.2 Product technical data sheet selector: mechanical anchors

[View detailed PDS selector](#)

Steel-to-concrete connections (post-installed anchors)

	Link to product technical data sheet (PDS)	Product picture	Fastener type					Base material		Design app	
			Externally threaded	Internally threaded	Hex head	Countersunk	Flat head	Close / open eye bolt	Cracked concrete	Uncracked concrete	PROFIS Engineering
Metal expansion anchor	HSL4		☑		☑	☑			☑	☑	☑
	HSL-3-R		☑		☑	☑		☑	☑	☑	
	HST4		☑					☑	☑	☑	
	HST3		☑					☑	☑	☑	
	HST2_V3		☑					☑	☑	☑	
	HST2		☑					☑	☑	☑	
	HSA		☑					☑	☑	☑	
	HSV		☑					☑	☑	☑	
	HSB		☑					☑	☑	☑	
	Undercut anchor	HDA		☑			☑		☑	☑	☑
HMU-PF			☑			☑		☑	☑	☑	
HSC			☑	☑		☑		☑	☑	☑	
Flush anchor	HKD			☑				☑	☑	☑	
	HKD redundant			☑				☑	☑	☑	
	HKV			☑				☑	☑	☑	
Screw anchor	HUS4		☑		☑	☑		☑	☑	☑	
	HUS4-R				☑	☑		☑	☑	☑	
	HUS3		☑	☑	☑	☑	☑	☑	☑	☑	
	HUS(-S) 6						☑	☑	☑	☑	
	HUS redundant		☑	☑	☑	☑	☑	☑	☑	☑	
Bonded screw anchor	HUS4-MAX		☑		☑	☑		☑	☑	☑	

	Link to product technical data sheet (PDS)	Product picture	Fastener Type					Base Material		Design App	
			Externally threaded	Internally threaded	Hex head	Countersunk	Flat head	Close / open eye bolt	Cracked concrete	Uncracked concrete	PROFIS Engineering
Plastic anchor	HRD				☑	☑	☑		☑	☑	☑
	HRD_red.				☑	☑	☑		☑	☑	
	HPS-1						☑		☑		
	HUD-1			☑					☑		
	HUD-2			☑					☑		
	HUD-L			☑					☑		
	HLD			☑					☑		
	GD14			☑				☑	☑		
	HRV			☑	☑				☑		
	Light duty anchor	HLV		☑		☑				☑	
HK			☑	☑				☑	☑		
HFB			☑				☑	☑	☑		
DBZ							☑	☑	☑		
HCA					☑			☑	☑		
HA8 NG							☑	☑	☑		
HLC			☑		☑	☑	☑	☑	☑		
Insulation fastener	HAM			☑	☑				☑		
	HT					☑		☑			
	HTH						☑		☑		
	HTR-P/M						☑		☑		
	IDP						☑		☑		
Others	IZ 8						☑		☑		
	HAP 2.5		Hoist Anchor Plate					☑	☑	☑	
	HAP 1.15		Hoist Anchor Plate					☑	☑	☑	



1.1.3 Handbooks, articles and design software

Steel-to-concrete connections (post-installed anchors)

Main information



Steel-to-concrete connections

This technical handbook for post-installed anchors in steel-to-concrete applications provides an overview on working principle, qualifications and design details against static/seismic/fire/fatigue loads as per European guidelines. It also describes methods of proper installation, on-site testing and other jobsite services offered by Hilti as total solution provider.

[View online](#)

Supporting information



Bridges and viaducts

This document helps to understand the different applications of post-installed fastening systems in bridges and viaducts. It includes brief overview on concrete extensions, overlays and baseplate fastenings with design and qualification details and some Hilti recommended solutions.

[View online](#)



Hilti method for anchor design in ungrouted stand-off connections

This document helps to understand the detail design criteria for Hilti Solution for Fastening (SOFA) method for shear force application with ungrouted stand-off. It presents design examples along with the functionalities in PROFIS Engineering.

[View online](#)



Beyond the edge with the Hilti method for fastening design

This document presents the Hilti SOFA method, which introduces an updated approach for distributing shear to a greater number of anchors beyond edge conditions. It includes design details and calculation examples based on EN and fib guidelines, along with features available in the PROFIS software for anchor design.

[View online](#)



Hilti method for anchor design in grouted stand-off connections

This document helps to understand the detail design criteria for Hilti Solution for Fastening (SOFA) method for shear force application with grouted stand-off. It presents design examples along with the functionalities in PROFIS Engineering.

[View online](#)



1.1.3 Handbooks, articles and design software

Steel-to-concrete connections (post-installed anchors)

Supporting information



Post-installed bonded screw anchor, an innovative technology

This document showcases the advantages of using post-installed bonded screw anchor HUS4-MAX over mechanical and chemical anchors. It describes updated design method with examples, qualification criteria as per European framework.

[View online](#)

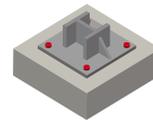
Design software



PROFIS Engineering

PROFIS Engineering for design of post installed anchor to concrete connections is an integrated software for design of anchors and steel baseplate.

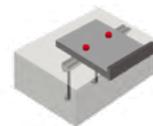
[View online](#)



Anchoring to concrete



Handrail



Façade



1.2. Concrete-to-concrete connections and strengthening (post-installed anchors)

The need to connect concrete members cast at different times – or to strengthen existing structural members – is becoming increasingly important and relevant. This growing demand arises from factors such as aging buildings, hazard-related risks, updated codes, sustainability goals, functional repurposing, and construction efficiency. Post-installed rebars (PIR) and shear connectors installed into hardened concrete are well-established

solutions that enable faster, safer, more economical, and more reliable connections between existing and new concrete elements (C2C connections). C2C connections can be used for member extensions, end anchorages, and shear strengthening using concrete overlays.

1.2.1 Images of applications

Concrete-to-concrete connections and strengthening (post-installed anchors)

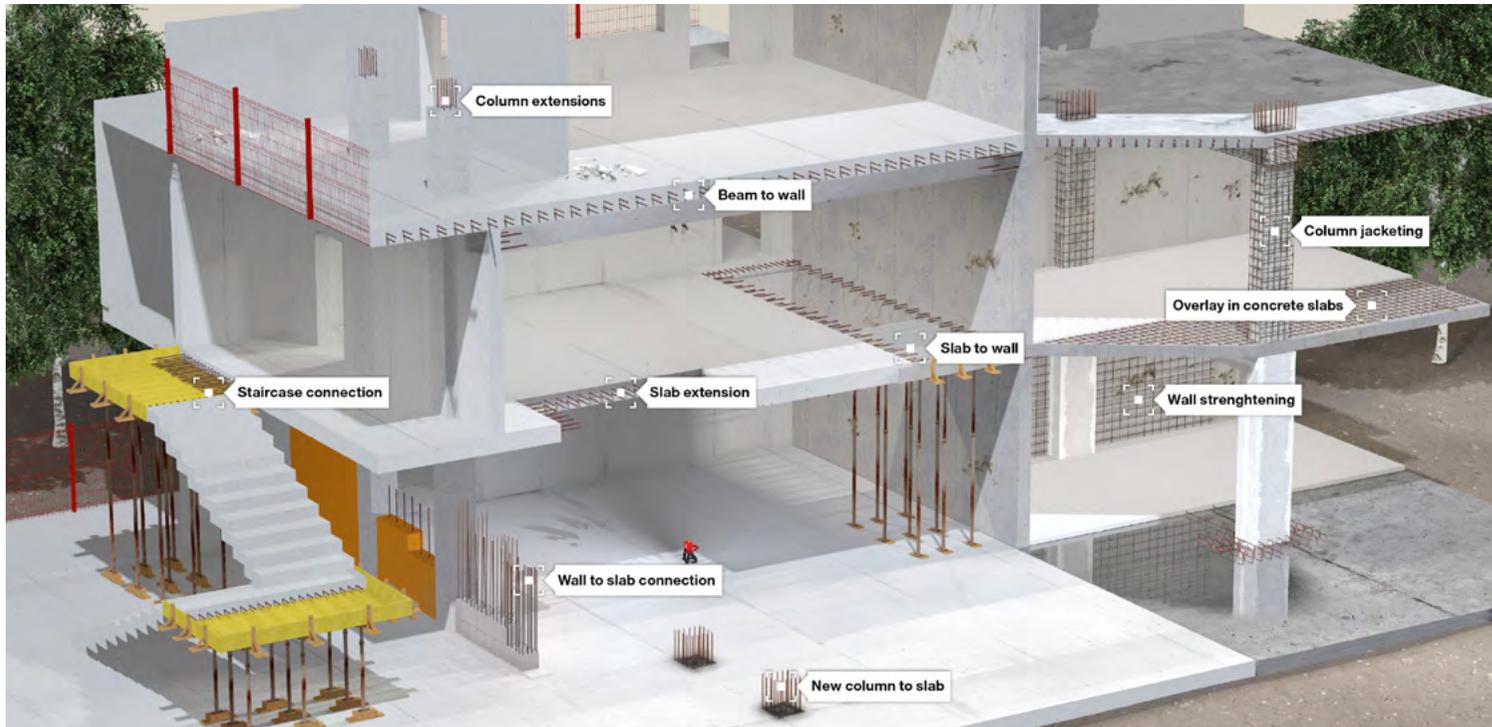


Illustration of typical applications in a building under construction



1.2.1 Images of applications

Concrete-to-concrete connections and strengthening (post-installed anchors)



Stair-to-wall connection



Slab-to-wall connection



Column-to-slab connection



Beam-to-column connection



Increasing RC beam depth



Strengthening of industrial floor



Increasing bridge girder thickness



Increasing bridge deck slab thickness



1.2.2 Product technical data sheet selector

[View detailed PDS selector](#)

Concrete-to-concrete connections and strengthening (post-installed anchors)

	Link to product technical data sheet (PDS)	Product picture	Fastener type					Base material		Setting		Design app
			Threaded rod HAS (U)	Internal threaded sleeve HIS-N HIT-IC	Expansion threaded rod HIT-Z HAS-D HAS-TZ HIT-CS-F	Rebar	Concrete connector HCC-K HCC-B HCC-U	Cracked concrete	Uncracked concrete	Fast cure @ 20 °C	Slow cure @ 20 °C	
Injection system	HIT-HY 200-R V3					☑		☑	☑	☑		☑
	HIT-HY 200-A V3					☑		☑	☑	☑		☑
	HIT-RE 500 V4					☑		☑			☑	☑
	HIT-RE 500 V3					☑		☑			☑	☑
	HIT-FP 700 R					☑		☑			☑	☑
	HIT-CT 100					☑		☑	☑			☑
	HIT-HY 170					☑		☑	☑			
	HIT-RE 100					☑		☑			☑	
	HIT-RE 10					☑		☑			☑	
Shear connector	HCC-K						☑	☑	☑	☑		☑
	HCC-U						☑	☑	☑	☑		☑
	HCC-B						☑	☑		☑		☑
	HUS4 connector						☑	☑				☑
Strengthening	Shear strengthening		☑					☑			☑	☑
	Punching shear strengthening		☑					☑			☑	☑



1.2.3 Handbooks, articles and design software

Concrete-to-concrete connections and strengthening (post-installed anchors)

Main information



Concrete-to-concrete connections

The handbook is a one-stop reference guide for post-installed rebar applications, including shear-connectors. It explains the state-of-the-art design methods & qualifications based on the European framework for static, seismic, fire, and fatigue loads. It also includes several design calculation examples.

[View online](#)



Strengthening concrete members in shear

This document introduces techniques to strengthen reinforced concrete members deficient in shear resistance, featuring Hilti's new post-installed HIT-Shear Strengthening solution. It presents the qualification criteria and introduces the design method and reinforcement detailing of the new Hilti solution to EN 1992-1-1:2004 and the German National Annex with a worked design example for a beam.

[View online](#)



Strengthening concrete members for punching shear

This document introduces techniques to strengthen reinforced concrete members deficient in punching shear resistance, featuring Hilti's new post-installed HIT-Punching Shear Strengthening solution. It presents the qualification criteria and introduces the design method and reinforcement detailing of the new Hilti solution to EN 1992-1-1:2004 and the German National Annex with a worked design example for slabs and foundations.

[View online](#)

Supporting information



Shear friction applications and concrete overlays

This document details advanced design and construction practices for post-installed concrete overlays. Utilizing the EOTA TR 066 design framework, it enables optimized thin overlay configurations. The Hilti method can be applied where bent-end rebars embedded in the cast-in substrate function as shear connectors.

[View online](#)



Bridges and viaducts

This document provides an overview of the main applications of fastening systems in bridges and viaducts, implemented through post-installed solutions—namely, rebars for concrete extensions and overlays, and baseplates for anchoring steel elements or equipment to concrete structures.

[View online](#)



1.2.3 Handbooks, articles and design software

Concrete-to-concrete connections and strengthening (post-installed anchors)

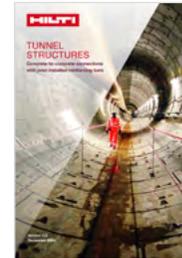
Supporting information



Post-installed reinforcement in end anchorages

EOTA TR 069 provides a design method based on improved bond-splitting behavior for end anchorages in structural members experiencing moment actions, using post-installed rebars without the need for establishing lap splices with existing reinforcement.

[View online](#)



Tunnel structures

This document explores how post-installed rebars can be designed to form monolithic connections between new concrete elements and existing tunnel linings across a wide range of applications. It also addresses key considerations such as fatigue, fire resistance, seismic loading, corrosion, and service life.

[View online](#)

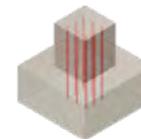
Design software



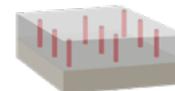
PROFIS Engineering

The design software solution for post-installed rebar connections, shear friction applications and concrete overlays enables precise, code-compliant structural calculations and supports efficient detailing for complex reinforcement scenarios. Additional modules addressing strengthening solutions for shear and punching-shear are available.

[View online](#)



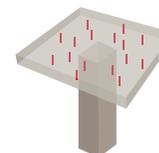
Post-installed rebar



Concrete overlay



Shear strengthening



Punching shear strengthening



1.3. Steel-to-masonry connections (post installed anchors)

The connection between non-structural (railings, facades, mechanical supports, fencing etc.) steel sections to existing masonry units built at a previous point in time is called steel-to-masonry (S2M) post-installed connections. These connections are

typically used for retrofitting existing structures and light fixtures for architectural or secondary applications. S2M connections provide essential support in both new or retrofitting applications allowing flexibility, strength and durability.

1.3.1 Images of applications

Steel-to-masonry connections (post-installed anchors)





1.3.2 Product technical data sheet selector

Steel-to-masonry connections (post-installed anchors)

[View detailed PDS selector](#)

	Link to product technical data sheet (PDS)	Product picture	Fastener Type				Base Material		Setting		Design App
			Threaded rod HAS (U)	Internal threaded sleeve HIS-N HIT-IC	Expansion threaded rod HIT-Z HAS-D HAS-TZ HIT-CS-F	Rebar	Solid brick masonry	Hollow brick masonry	Fast cure @ 20°C	Slow cure @ 20°C	
Injection system	HIT-HY 270		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	HIT-HY 170		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
	HIT-MM Plus		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			

	Link to product technical data sheet (PDS)	Product picture	Fastener Type						Base Material			Design App	
			Externally threaded	Internally threaded	Hex head	Countersunk	Flat head	Close / open eye bolt	Solid brick masonry	Hollow brick masonry	Drywall		
Screw anchor	HUS4		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>				
	HUS4-R				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>				
	HUS3		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>								
	HUS(-S) 6						<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				
Plastic anchor	HRD red				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
	HPS-1						<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
	HUD-1							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
	HUD-2			<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
	HUD-L			<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
HLD			<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			
Insulation fastener	HAM			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>					
	HTI					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
	HHD-S			<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>			
	HSP_HFP			<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>			
	HTB 3			<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>			
Others	HTH						<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				
	HTR-P/M					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
	IDP					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
	IZ 8					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Others	Heli-Brick		Masonry connector / strengthening						<input checked="" type="checkbox"/>				



1.3.3 Design software

Steel-to-masonry connections (post-installed anchors)

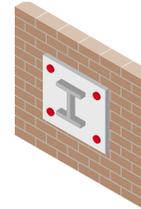
Design software



PROFIS Engineering

The design software solution for post-installed anchor-to-masonry connections enables structural calculations and supports efficient detailing for various masonry base materials.

[View online](#)



Anchoring to masonry



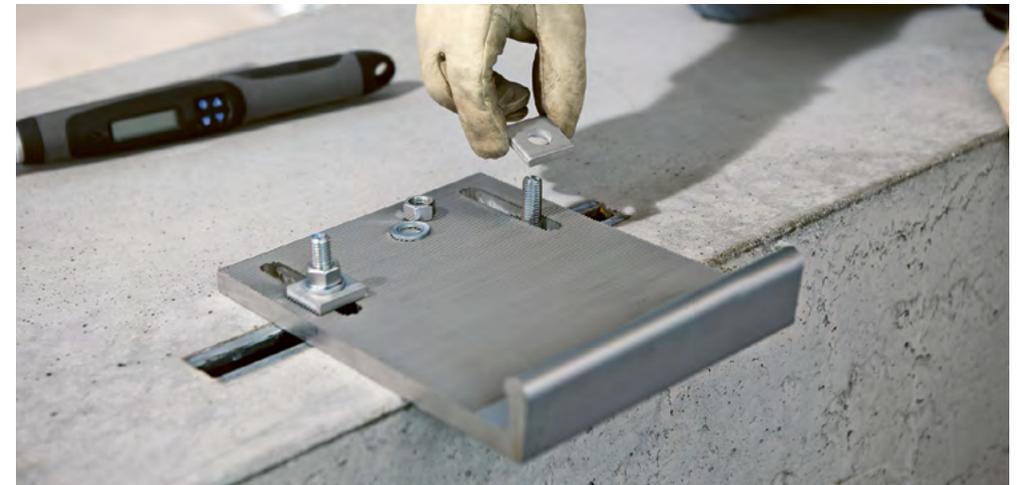
1.4. Steel-to-concrete connections (cast-in systems)

Anchor channel and single point cast-in systems are a cost-effective cast-in anchoring to concrete technology. These technologies provide solutions for job site tolerances and on-site adjustability when connecting structural and non-structural elements. Anchor channel systems consist of a group of anchors connected to a channel profile (anchor channel) and a proprietary matching head channel bolt (T-bolt). The anchor channel is installed prior to casting of the concrete.

Single point fastenings consist of a steel element installed in the desired position of a concrete member before casting the concrete. While they require a high level of pre-planning to ensure the right positioning, they ensure reliable load transfer with minor sensitivity to onsite installation conditions.

1.4.1 Images of applications

Steel-to-concrete connections (cast-in-systems)





1.4.2 Product technical data sheet selector

Steel-to-concrete connections (cast-in-systems)

[View detailed PDS selector](#)

	Link to product technical data sheet (PDS)	Product picture	Channel type						Bolt type				Base material			Design app
			Round anchor	I-anchor	Smooth channel lip	Serrated channel lip	Cold formed	Hot rolled	TCRS	Serrated bolt	Notched bolt	Smooth bolt	Internal thread	Cracked concrete	Uncracked concrete	Steel
Anchor channels	HAC-C-T		✓			✓			✓				✓	✓		✓
	HAC-C cold		✓		✓		✓				✓		✓	✓		✓
	HAC-C hot		✓	✓	✓					✓	✓		✓	✓		✓
	HAC-C-P		✓	✓	✓					✓	✓		✓	✓		✓
	HAC-V		✓		✓	✓				✓	✓	✓	✓	✓		✓
	HAC-V with MQM Wing nut		✓			✓						✓	✓	✓		✓
Weldable channels	HMC				✓	✓		✓	✓	✓				✓		
Special elements	HCX(-R)		✓									✓	✓	✓		



1.4.3 Handbooks, articles and design software

Steel-to-concrete connections (cast-in-systems)

Main information



Anchor channel fastening

This document explains the design of anchor channel fastening systems for static, fatigue, and fire loads in accordance with European guidelines. It also presents design examples using Hilti's core products.

[View online](#)

Supporting information



Field fixes

This document provides technical guidance on field fixes for installation errors involving HAC, HAC-T, and HAC-C(-P) cast-in anchor channels used with HBC channel bolts. It illustrates the correct installation procedures and offers recommendations and corrective measures to be applied on-site in cases of improper installation.

[View online](#)

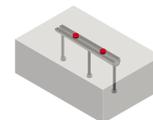
Design software



PROFIS Engineering

The design software solution for cast-in anchor channel connections enables structural calculations and supports efficient detailing for various concrete applications. A specific module for fixing of façade elements to concrete is also available.

[View online](#)



Anchor channel



Façade



2. Code landscape

2.1. Qualification and design

European framework

European standards and regulatory frameworks guide testing, assessment, and design of post-installed systems. The Construction Products Regulation (CPR) lays down harmonized rules for the marketing of construction products (taken from the EU webpage) in Europe. Below are definitions to clarify terminology that may be used throughout this document:

European Committee for Standardization (CEN)

CEN, recognized by the European Union as a European Standardization Organization, brings together knowledge and expertise from its members, business and industry, and from other stakeholders, to develop European Standards. CEN provides a platform for the development of European Standards and other technical documents in relation to various kinds of products, materials, services and processes. These standards help to protect the environment, as well as the health and safety of consumers and workers.

Eurocodes

Eurocodes (EC or EN) are harmonized technical rules specifying how structural design should be conducted within the European Union. These codes are developed by the European Committee for Standardization upon the request of the European Commission.

European Organization for Technical Assessment (EOTA)

EOTA was established by Regulation (EU) No 305/2011 and comprises all Technical Assessment Bodies (TABs) designated by member states of the European Union and the European Economic Area. EOTA coordinates the application of the procedures set for requests for European Technical Assessment (ETA) and for the procedures for adopting a European Assessment Document (EAD). EOTA also informs the European Commission and the Standing Committee on Construction of any issues related to the preparation of EADs and suggests improvements to the European Commission based on its experience.

European Assessment Document (EAD)

A European Assessment Document (EAD) is a harmonized technical specification developed by EOTA as the basis for European Technical Assessments (ETAs). The development of new, or the amendment of existing, EADs is usually triggered by an ETA request from a manufacturer.

European Technical Assessment (ETA)

The European Technical Assessment (ETA), also referred to as an “Approval” provides an independent Europe-wide procedure for assessing the essential performance characteristics of a construction product. It provides the documented assessment of the performance of a construction product, in relation to its essential characteristic, in accordance with the respective EAD.

CE-marking

The manufacturer is required to affix CE marking to construction products covered by an ETA as a recognizable indication of compliance with a Europe-wide technical specification (which, in the case of product qualification via an ETA, is the underlying EAD). CE stands for “Conformité Européenne.” The complete CE mark includes not only the letters “CE” in a predefined format but also references to relevant supporting content.



2.1. Qualification and design

Certificate of Constancy of Performance (CoCP)

For construction products covered by a European Technical Assessment (ETA), it is required to continuously assess and verify the constancy of performance (AVCP) as defined in the ETA. To ensure this, the manufacturer must implement and maintain a quality assurance program at the manufacturing plant, known as Factory Production Control (FPC).

Due to its critical safety relevance—particularly for anchor products—it is required to appoint a surveillance agency, independent of the supplier, to verify the proper execution of the FPC through audits at the manufacturing facility. This surveillance agency is referred to as the Notified Body (NB), whose competence for the relevant European Assessment Document (EAD) must be confirmed in advance by notification through the appropriate building authority.

The Notified Body issues the Certificate of Constancy of Performance, referencing the ETA, as independent confirmation that constancy of performance is ensured through the successful implementation and maintenance of the FPC.

Declaration of Performance (DoP)

This document is prepared by the manufacturer for a construction product being placed on the market, which is either subject to a European Technical Assessment (ETA) or covered by a harmonized standard. It contains a statement about the product's performance in relation to its essential characteristics, in accordance with the relevant EAD or harmonized technical specification.

Each DoP has a unique identification code, which is referenced in the CE marking affixed to the product. The DoP serves as the manufacturer's binding confirmation that the delivered product complies with the performance as assessed in the corresponding ETA according to the relevant EAD.

Technical Reports (TR)

EOTA Technical Reports are developed as supporting documents to EADs. They contain detailed aspects relevant to construction products—such as design, execution, and evaluation of tests—and reflect the shared understanding of existing knowledge and experience among the Technical Assessment Bodies in EOTA at a given point in time.

National Approvals

Most technical data for the products and solutions listed in this document have been assessed by TABs according to EOTAs EADs. However, in some case national approvals are also referenced, as they address state-of-the-art assessment of product characteristics, which are not covered by EADs. Such approvals find a wide acceptance at international level. Examples are fatigue assessment of post-installed rebar system (DIBt) and shock approvals for post-installed anchors (Swiss Federal Civil Protection BZS).

Refer to each Product Technical Data Sheet (PDS) for more details.



Hilti Aktiengesellschaft
9494 Schaan, Liechtenstein
P +423-234 2965

www.facebook.com/hiltigroup
www.hilti.group

Connect with us:

