

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

## ETA-18/0078 of

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Hilti channel connector MQN-B

Product family  
to which the construction product belongs

Products related to installation systems supporting  
technical equipment for building services such as pipes,  
conduits, ducts and cables

Manufacturer

Hilti AG  
Feldkircherstraße 100  
9494 Schaan  
FÜRSTENTUM LIECHTENSTEIN

Manufacturing plant

L 1000485

This European Technical Assessment  
contains

9 pages including 5 annexes which form an integral part  
of this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

EAD 280016-00-0602

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## Specific part

### 1 Technical description of the product

Object of this European Technical Assessment is the Hilti channel connector MQN-B. Hilti channel connector MQN-B consists of a nut, a screw, a clamping plate and a spring manufactured from steel. There is a centred round opening on both the clamping plate and the nut, which overlap each other axially with the screw passing through. The screw and nut are connected together and rotate together. Between the nut and the clamping plate is a pre-tensioned spring that lies perpendicular to the baseplate.

The Hilti channel connector MQN-B is used to fasten connectors manufactured from metal such as the Hilti angle connector and Hilti channel supports to Hilti installation channels. In doing so, the Hilti channel connector MQN-B is inserted in the installation opening of the channel and the connecting component, and by pressing on the screw then turning it, it rotates 90° together with the screw. The nut then engages with the retaining projections on the installation channels. By applying force that counteracts the spring force on the screw, the Hilti channel connector MQN-B can be adjusted longitudinally to the installation opening. To finally fasten to the installation channel, the nut is firmly clamped to the retaining projections on the installation channel by tightening the screw.

Annex A describes the dimensions and materials of the Hilti channel connector MQN-B. The requirements for performance assessment are given in Annex B.

### 2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

The performance given in Section 3 can only be assumed if the Hilti channel connector MQN-B is used in compliance with the specifications and under boundary conditions set out in Annexes A to C. The test and assessment methods on which this European Technical Assessment is based lead to an assumption of a working life of the Hilti channel connector MQN-B of at least 50 years in final use under ambient temperatures in indoor areas. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

In accordance with the European Assessment Document EAD 280016-00-0602, the product is intended to be used in

- a) installations for the support of sprinkler kits;
- b) installations for the support of other building service elements such as pipes, conduits, ducts and cables.

### 3 Performance of the product and references to the methods used for its assessment

#### 3.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	A1

**3.2 Safety and accessibility in use (BWR 4)**

Essential characteristic	Performance
Dimensions and materials of Hilti channel connector MQN-B	see Annex A
Resistance of Hilti channel connector MQN-B at ambient temperature	see Annex C

**4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base**

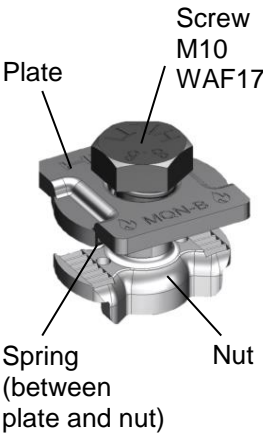
In accordance with the European Assessment Document EAD 280016-00-0602, the following legal bases apply:

- In case of intended use a) specified in Section 2:  
Decision of the commission N° 1996/577/EC:  
System 1 applies for the assessment and verification of constancy of performance (AVCP).
- In case of intended use b) specified in Section 2:  
Decision of the commission N° 1999/472/EC:  
System 3 applies for the assessment and verification of constancy of performance (AVCP).

**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD**

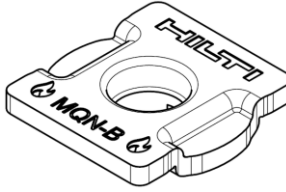
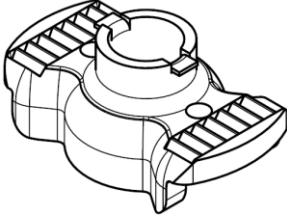
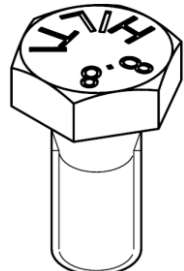

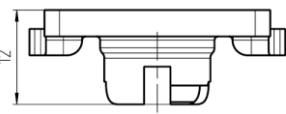
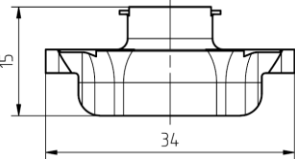
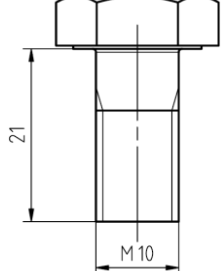
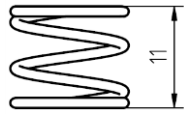
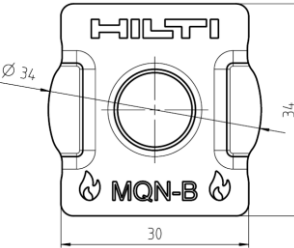
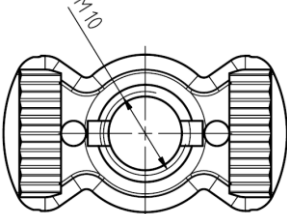
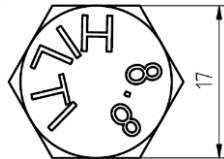
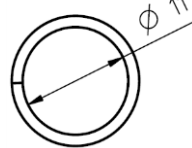
The technical details necessary for the implementation of the system for the assessment and verification of constancy of performance are laid down in the control plan (confidential part of this European Technical Assessment) deposited at Deutsches Institut für Bautechnik.

Table A1: Materials of the components of the Hilti channel connector MQN-B

Illustration	Item number	Designation	Material
	2184853	MQN-B	<p>Plate: DD11 in accordance with EN 10111<sup>1)</sup>, zinc coated</p> <p>Nut: S355MC in accordance with EN 10149-2, zinc coated</p> <p>Screw: strength class 8.8 in accordance with EN ISO 898-1, zinc coated</p> <p>Spring element: X10CrNi18-8 in accordance with EN 10270-3</p>

<sup>1)</sup> with  $235 \text{ N/mm}^2 \leq R_{eL} \leq 340 \text{ N/mm}^2$ , Method of deoxidation: fully killed

Table A2: Dimensions<sup>2)</sup> of the components of the Hilti channel connector MQN-B

Plate	Nut	Screw	Spring element
			
			
			

<sup>2)</sup> Dimensions in mm

Hilti channel connector MQN-B

Product description  
Dimensions and materials

Annex A

- The Hilti channel connector MQN-B is used to transfer the loads of building services components such as ducts and equipment for sprinkler, water, heating, cooling, ventilation, electrical and other installations. The Hilti channel connector MQN-B is suitable for undertaking this load-bearing function under the conditions described in Section 2 of this European Technical Assessment.
- The Hilti channel connector MQN-B is used to fasten connectors manufactured from metal such as the Hilti angle connector and Hilti channel supports to Hilti installation channels. The nut and the plate on the channel connector are firmly connected to the installation channel and the attached component by tightening the screw.
- The performance of the Hilti channel connector MQN-B results in connection with Hilti installation channels as per Table B2. The channels are cut to length centrally between the longholes or the roundholes at the marking. The cut channel is within a range of 2 mm from both sides of the marking.
- The installation instructions according to Figure B1.1 are a prerequisite for the information on the performance assessment in Annex C.
- The longitudinal axes of the MQN-B nut and the channel are perpendicular to each other after assembly with centric position of the screw between the parallel flanges of the channel.
- Information on resistance at ambient temperature applies to static and centric actions.
- The centric distance of the MQN-B nut from the channel end is 29 mm to assess the pull-out resistance of the channel connector given by the geometry of the adapter for load introduction.
- The adjacent component to the channel to assess the shear resistance of the channel connector is made of the steel type S235JR in accordance with EN 10025 with 4 mm thickness and with the opening geometry to pass through the nut of the channel connector according to Figure B1.2.

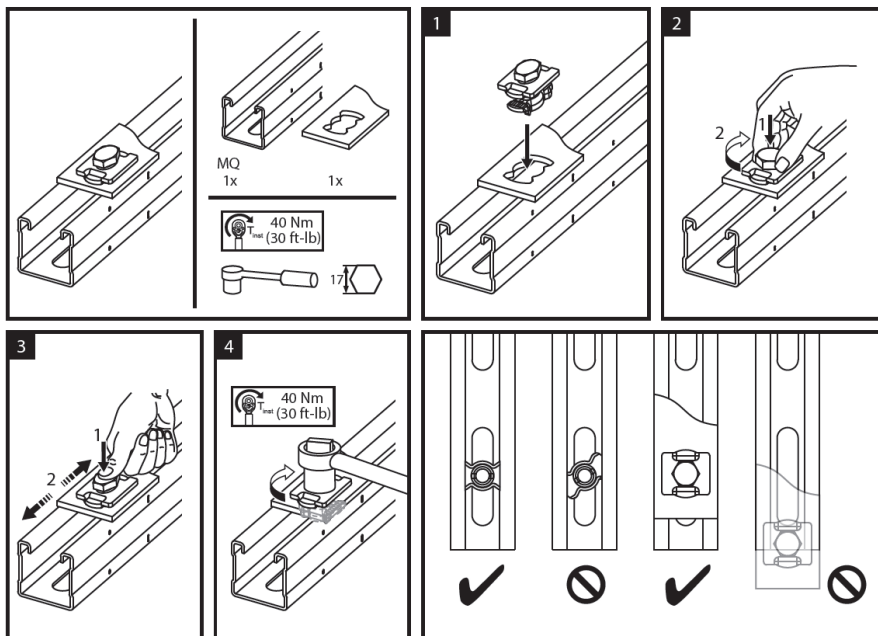


Figure B1.1: Installation instructions

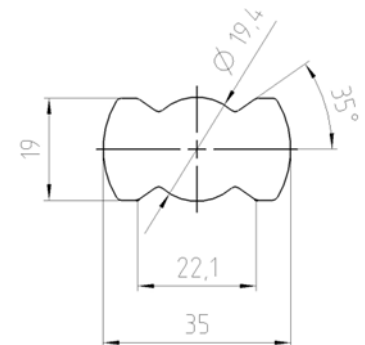


Figure B1.2:  
Opening geometry to pass through the nut of the channel connector (dimensions in mm)

Hilti channel connector MQN-B	Annex B1
Requirements for performance assessment	

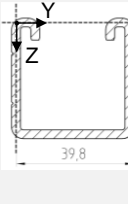
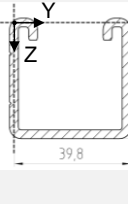
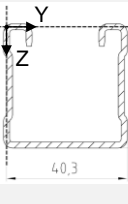
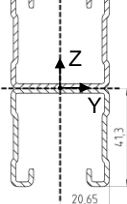
Table B2: Dimensions and materials of installation channels for use with Hilti channel connector MQN-B

Illustration <sup>3)</sup>	Item number	Designation	Length [m]	Material and coating
	369596	MQ-41/3 3M	3	S250GD+Z275-M-A-C in accordance with EN 10346
	369597	MQ-41/3 6M	6	
	2048102	MQ-41/3 3M LL	3	S250GD+Z275-M-A-C in accordance with EN 10346
	2048103	MQ-41/3 6M LL	6	
	369603	MQ-41 D 3m	3	S250GD+Z275-M-A-C in accordance with EN 10346
	369604	MQ-41 D 6m	6	
	369592	MQ-41 6m	6	S250GD+Z275-M-A-C in accordance with EN 10346
	369591	MQ-41 3m	3	
	304559	MQ-41 2m	2	

<sup>3)</sup> Dimensions in mm

Hilti channel connector MQN-B	Annex B2
Requirements for performance assessment	

Table B3: Cross-section properties of installation channels for use with Hilti channel connector MQN-B

Description	Symbol	MQ-41/3	MQ-41/3 LL	MQ-41	MQ-41 D	Unit
						
Classification cross section in accordance with EN 1993-1-1	-	3	3	3	3	-
Cross section areas	A	375.88	379.93	263.62	545.97	mm <sup>2</sup>
	A <sub>tot</sub>	375.88	379.93	263.62	545.97	mm <sup>2</sup>
Shear areas	A <sub>y</sub>	48.69	54.43	27.23	66.37	mm <sup>2</sup>
	A <sub>z</sub>	195.47	194.59	131.51	197.58	mm <sup>2</sup>
Centroid position	y <sub>C,0</sub>	19.15	19.15	19.65	0.00	mm
	z <sub>C,0</sub>	20.57	20.76	20.52	0.00	mm
Moments of inertia	I <sub>y</sub>	76963.50	78224.80	57501.00	323585.00	mm <sup>4</sup>
	I <sub>z</sub>	107949.00	108011.00	76416.00	154070.00	mm <sup>4</sup>
Inclination of principal axes	α	90.00	90.00	90.00	0.00	°
Polar moments of inertia	I <sub>p</sub>	184913.00	186236.00	133917.00	477656.00	mm <sup>4</sup>
	I <sub>p,M</sub>	778900.00	780561.00	601859.00	477656.00	mm <sup>4</sup>
Radii of gyration	i <sub>y</sub>	14.31	14.35	14.77	24.35	mm
	i <sub>z</sub>	16.95	16.86	17.03	16.80	mm
Polar radii of gyration	i <sub>p</sub>	22.18	22.14	22.54	29.58	mm
	i <sub>p,M</sub>	45.52	45.33	47.78	29.58	mm
Warping radius of gyration	i <sub>w,M</sub>	7.02	7.02	7.19	17.32	mm
Torsional constant	J	848.88	856.29	269.75	575.03	mm <sup>4</sup>
Secondary torsional constant	J <sub>s</sub>	105319.00	105394.00	74075.40	91246.30	mm <sup>4</sup>
Location of the shear center	y <sub>M,0</sub>	19.15	19.15	19.65	0.00	mm
	z <sub>M,0</sub>	60.32	60.31	62.63	0.00	mm
	y <sub>M</sub>	0.00	0.00	0.00	0.00	mm
	z <sub>M</sub>	39.75	39.55	42.11	0.00	mm
Warping constants	I <sub>w,C</sub>	2.09277E+08	2.07678E+08	1.66135E+08	1.43225E+08	mm <sup>6</sup>
	I <sub>w,M</sub>	38387600	38417600.00	31116700.00	1.43225E+08	mm <sup>6</sup>
	r <sub>w,M</sub>	0.00	0.00	0.00	0.00	-
Section moduli	S <sub>y,max</sub>	4002.48	4108.45	2906.72	7834.29	mm <sup>3</sup>
	S <sub>y,min</sub>	-3487.10	-3514.15	-2672.22	-7833.74	mm <sup>3</sup>
	S <sub>z,max</sub>	5227.58	5230.56	3700.53	7460.71	mm <sup>3</sup>
	S <sub>z,min</sub>	-5277.58	-5230.56	-3700.54	-7460.71	mm <sup>3</sup>
Torsional section modulus	S <sub>t</sub>	282.96	285.43	134.88	287.51	mm <sup>3</sup>
Max. plastic bending moment	M <sub>pl,y,k</sub>	NPA <sup>4)</sup>	NPA	NPA	NPA	kNm
	M <sub>pl,z,k</sub>	NPA	NPA	NPA	NPA	kNm
Max. plastic section moduli	Z <sub>y</sub>	NPA	NPA	NPA	NPA	mm <sup>3</sup>
	Z <sub>z</sub>	NPA	NPA	NPA	NPA	mm <sup>3</sup>
Plastic shear areas	A <sub>pl,y</sub>	NPA	NPA	NPA	NPA	mm <sup>2</sup>
	A <sub>pl,z</sub>	NPA	NPA	NPA	NPA	mm <sup>2</sup>
Area bisecting axis position	f <sub>y,0</sub>	NPA	NPA	NPA	NPA	mm
	f <sub>z,0</sub>	NPA	NPA	NPA	NPA	mm
Plastic shear forces	V <sub>pl,y,k</sub>	NPA	NPA	NPA	NPA	kN
	V <sub>pl,z,k</sub>	NPA	NPA	NPA	NPA	kN
Plastic axial force	N <sub>pl,k</sub>	NPA	NPA	NPA	NPA	kN
Buckling curves	BC <sub>y</sub>	c	c	c	c	-
	BC <sub>z</sub>	c	c	c	c	-

<sup>4)</sup> NPA: no performance assessed

Hilti channel connector MQN-B

Requirements for performance assessment

Annex B3



Table C1: Characteristic pull-out resistance at ambient temperature

Channel connector	Installation channel	Characteristic pull-out resistance	Partial safety coefficient <sup>5)</sup>
		$F_{Rk,y}$ [kN]	$\gamma_M$
MQN-B	MQ-41/3	16.33	1.25
	MQ-41/3 LL		
	MQ-41	12.46	1.78
	MQ-41 D		

Table C2: Characteristic shear resistance at ambient temperature

Channel connector	Installation channel	Characteristic shear resistance	Partial safety coefficient <sup>5)</sup>
		$F_{Rk,x}$ [kN]	$\gamma_M$
MQN-B	MQ-41/3	10.42	1.25
	MQ-41/3 LL		
	MQ-41	10.72	1.53
	MQ-41 D		

<sup>5)</sup> provided that no other national regulations apply

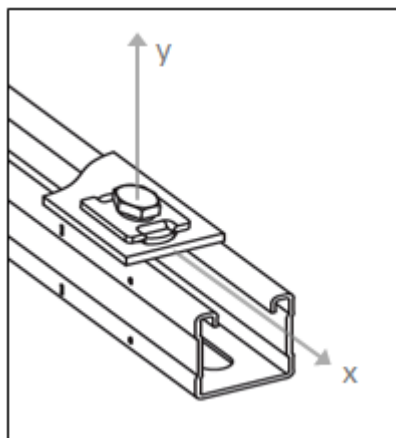


Figure C1: Coordinate system for the pull-out and shear resistance

Hilti channel connector MQN-B	Annex C
Resistance at ambient temperature	