Deutsches Institut für Bautechnik

Member of EOTA
www.eota.eu

Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-18/0102 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 drilled plate MQZ-L11 and Hilti drilled plate MQZ-L13
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 1000446 L 1005049
This European Technical Assessment contains	12 pages including 8 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

Deutsches Institut für Bautechnik
Kolonnenstraße 30 B | 10829 Berlin | GERMANY | Phone: +49 30 78730-0 | Fax: +49 30 78730-320 | Email: dibt@dibt.de | www.dibt.de

The European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction shall be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission in accordance with Article 25(3) of Regulation (EU) No 305/2011.

Specific part

1 Technical description of the product

Object of this European Technical Assessment is the Hilti drilled plate MQZ-L11 and Hilti drilled plate MQZ-L13. The Hilti MQZ-L11 and MQZ-L13 drilled plates are steel plates that are stamped rectangularly with a centrally positioned opening, which is 11.5 mm or 13.5 mm in diameter. The plates have raised edges in the corners at the rear to ensure a perfect fit with the Hilti installation channels.

Annex A describes the dimensions and materials of the Hilti MQZ-L11 and MQZ-L13 drilled plates. 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 MQZ-L11 and MQZ-L13 drilled plates 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 MQZ-L11 and MQZ-L13 drilled plates 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 MQZ-L11 and MQZ-L13 drilled plates	see Annex A
Resistance of Hilti MQZ-L11 and MQZ-L13 drilled plates at ambient temperature	see Annex C
Resistance of Hilti MQZ-L11 and MQZ-L13 drilled plates at elevated temperature	see Annex D

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

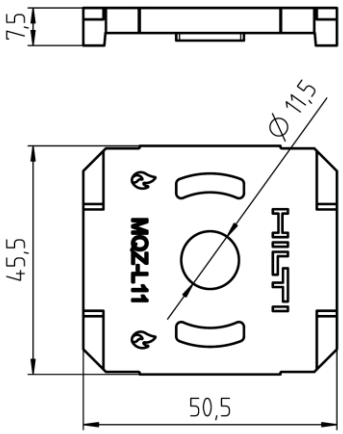
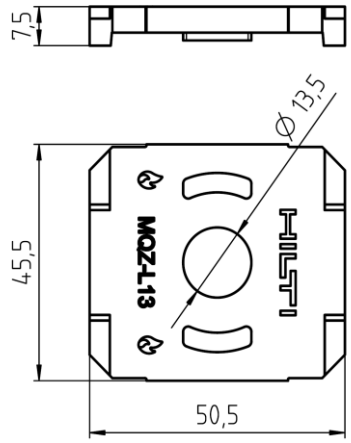
In accordance with the European Assessment Document EAD 280016-00-0602, the following legal bases apply:

- 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: Dimensions and materials of drilled plates

Illutration	Dimension [mm]	Designation	Item-number	Materials
		MQZ-L11	2199455	S235JR in accordance with EN 10025-2, zinc coated
		MQZ-L13	2199456	S235JR in accordance with EN 10025-2, zinc coated

Hilti drilled plate MQZ-L11 and Hilti drilled plate MQZ-L13	Annex A
Product description Dimensions and materials	

- MQZ-L11 and MQZ-L13 drilled plates are used in building service installation systems at ambient temperature and at elevated temperatures. MQZ-L11 and MQZ-L13 drilled plates are used to transfer building services component loads such as ducts and equipment for sprinklers, water, heating, cooling, ventilation, electrical and other installations. MQZ-L11 and MQZ-L13 drilled plates described in this ETA are suitable for undertaking this load-bearing function under the conditions listed in Section 2.

- MQZ-L11 and MQZ-L13 drilled plates are used to fix threaded rods to installation channels or brackets in conjunction with hexagonal nuts.

- The following information is a prerequisite for the information on the performance assessment in Annex C and D:

  - The performance of MQZ-L11 results in connection with zinc coated threaded rods in accordance with EN ISO 898-1 in strength class 4.8 as per table B2.1, zinc coated hexagonal nuts in accordance with EN ISO 898-2 in strength class 8 as per table B2.3 and Hilti installation channels according to Annex B3 to B5.

  - The performance of MQZ-L13 results in connection with zinc coated threaded rods in accordance with EN ISO 898-1 in strength class 4.8 as per table B2.2, zinc coated hexagonal nuts in accordance with EN ISO 898-2 in strength class 8 as per table B2.4 and Hilti installation channels according to Annex B3 to B5.

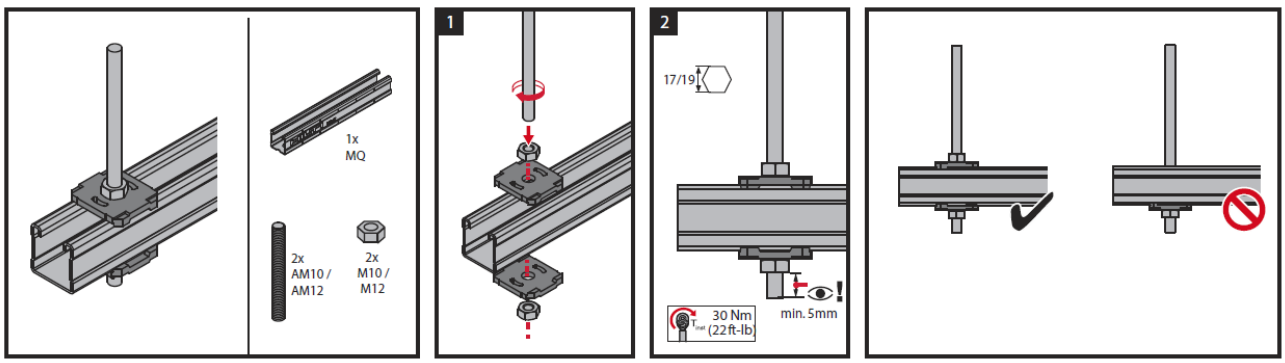
  - The resistance at ambient and elevated temperatures applies for static and centric actions according to the following set up:

    The centre distance of the MQZ-L11 or MQZ-L13 drilled plates from the channel end is 25 mm. The centre distance of the suspension points with the drilled plates is 250 mm. The load is applied centrically between the suspension points.

  - The resistance and deformation at elevated temperatures is referring to the boundary conditions of the standard temperature time curve in accordance with EN 1363-1.

  - Installation instructions:

    The installation channels are cut to length centrally between the longholes or the roundholes at the marking. The cut channel lies within a range of 2 mm from both sides of the marking.



Hilti drilled plate MQZ-L11 and Hilti drilled plate MQZ-L13	Annex B1
Requirements for performance assessment	

Table B2.1: Threaded rods for use with MQZ-L11

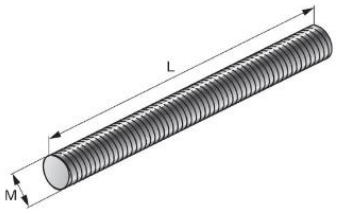
Illutration	Designation	Item number	M thread	L [mm]
	AM10x3000 4.8	216418	M10	3000
	AM10x2000 4.8	339796	M10	2000
	AM10x1000 4.8	339795	M10	1000

Table B2.2: Threaded rods for use with MQZ-L13

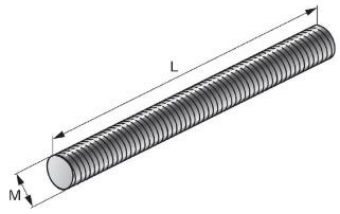
Illutration	Designation	Item number	M thread	L [mm]
	AM12x3000 4.8	216421	M12	3000
	AM12x2000 4.8	216420	M12	2000
	AM12x1000 4.8	339797	M12	1000

Table B2.3: Hexagonal nuts for use with MQZ-L11

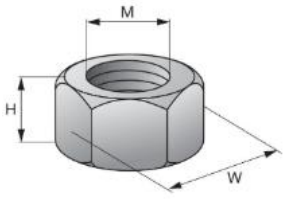
Illutration	Designation	Item number	M thread	W [mm]	H [mm]
	M10 hexagonal nut	216466	M10	17	8

Table B2.4: Hexagonal nuts for use with MQZ-L13

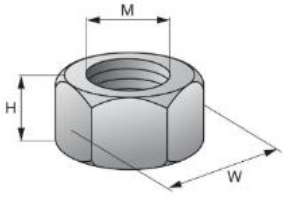
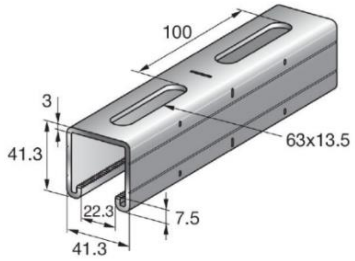
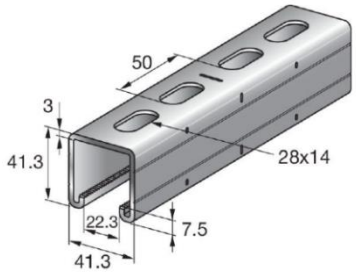
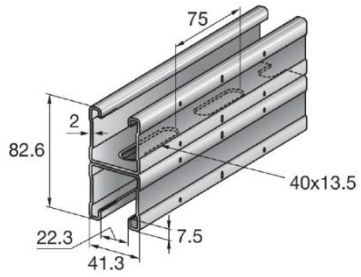
Illutration	Designation	Item number	M thread	W [mm]	H [mm]
	M12 hexagonal nut	216467	M12	19	10

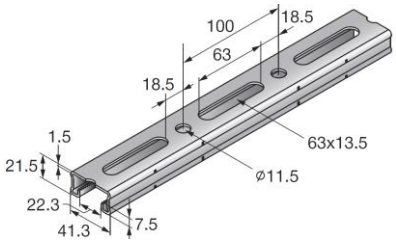
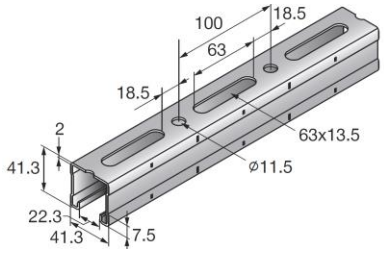
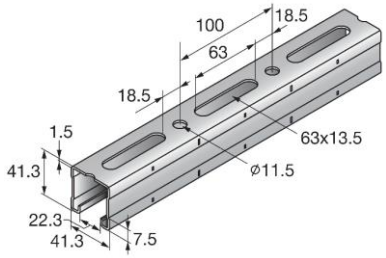
Table B3: Dimensions and materials of installation channels for use with Hilti drilled plates

Illutration[1)]	Item number	Designation	Length [m]	Materials and coatings
	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	

[1)] Dimensions in mm

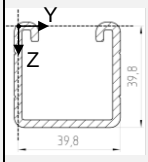
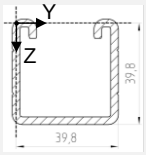
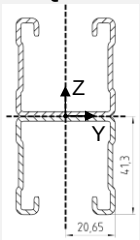
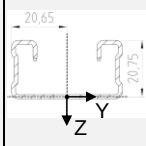
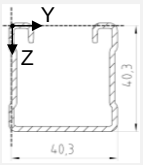
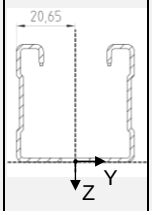
Hilti drilled plate MQZ-L11 and Hilti drilled plate MQZ-L13	Annex B3
Requirements for performance assessment	

Table B4: Dimensions and materials of installation channels for use with Hilti drilled plates

Illutration[2)]	Item number	Designation	Length [m]	Materials and coatings
	2184773	MQ-21.5 6m	6	S280GD+Z140-M-A-C in accordance with EN 10346
	2184772	MQ-21.5 3m	3	
	2184771	MQ-21.5 2m	2	
	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	
	2141964	MQ-41-L 6m	6	S250GD+Z140-M-A-C in accordance with EN 10346
	2141965	MQ-41-L 3m	3	
	2141966	MQ-41-L 2m	2	

[2)] Dimensions in mm

Table B5: Section properties of installation channels for use with Hilti drilled plates

Description	Symbol	MQ-41/3	MQ-41/3 LL	MQ-41 D	MQ-21.5	MQ-41	MQ-41-L	Unit
								
Classification cross section in accordance with EN 1993-1-1	-	3	3	3	3	3	3	-
Cross section areas	A	375.88	379.93	545.97	142.71	263.62	199.57	mm^2
	A_{tot}	375.88	379.93	545.97	142.71	263.62	199.57	mm^2
Shear areas	A_y	48.69	54.43	66.37	23.47	27.23	20.24	mm^2
	A_z	195.47	194.59	197.58	41.86	131.51	98.37	mm^2
Centroid position	$y_{C,0}$	19.15	19.15	0.00	0.00	19.65	0.00	mm
	$z_{C,0}$	20.57	20.76	0.00	-9.12	20.52	-19.91	mm
Moments of inertia	I_y	76963.50	78224.80	323585.00	9168.75	57501.00	44773.00	mm^4
	I_z	107949.00	108011.00	154070.00	37416.40	76416.00	58981.50	mm^4
Inclination of principal axes	α	90.00	90.00	0.00	90.00	90.00	90.00	°
Polar moments of inertia	I_p	184913.00	186236.00	477656.00	46585.10	133917.00	103754.00	mm^4
	$I_{p,M}$	778900.00	780561.00	477656.00	115093.00	601859.00	469974.00	mm^4
Radii of gyration	i_y	14.31	14.35	24.35	8.02	14.77	14.98	mm
	i_z	16.95	16.86	16.80	16.19	17.03	17.19	mm
Polar radii of gyration	i_p	22.18	22.14	29.58	18.07	22.54	22.80	mm
	$i_{p,M}$	45.52	45.33	29.58	28.40	47.78	48.53	mm
Warping radius of gyration	$i_{\omega,M}$	7.02	7.02	17.32	6.85	7.19	7.44	mm
Torsional constant	J	848.88	856.29	575.03	76.58	269.75	112.13	mm^4
Secondary torsional constant	J_s	105319.00	105394.00	91246.30	25157.50	74075.40	565590.00	mm^4
Location of the shear center	$y_{M,0}$	19.15	19.15	0.00	0.00	19.65	0.00	mm
	$z_{M,0}$	60.32	60.31	0.00	12.77	62.63	22.92	mm
	y_M	0.00	0.00	0.00	0.00	0.00	0.00	mm
	z_M	39.75	39.55	0.00	21.90	42.11	42.84	mm
Warping constants	$I_{\omega,C}$	2.09277E+08	2.07678E+08	1.43225E+08	23255400.00	1.66135E+08	1.34296E+08	mm^6
	$I_{\omega,M}$	38387600	38417600.00	1.43225E+08	5395050.00	31116700.00	26017600	mm^6
	$r_{\omega,M}$	0.00	0.00	0.00	0.00	0.00	0.00	-
Section moduli	$S_{y,max}$	4002.48	4108.45	7834.29	928.54	2906.72	2248.07	mm^3
	$S_{y,min}$	-3487.10	-3514.15	-7833.74	-788.66	-2672.22	-2093.62	mm^3
	$S_{z,max}$	5227.58	5230.56	7460.71	1811.93	3700.53	2856.29	mm^3
	$S_{z,min}$	-5277.58	-5230.56	-7460.71	-1811.93	-3700.54	-2856.25	mm^3
Torsional section modulus	S_t	282.96	285.43	287.51	51.06	134.88	75.76	mm^3
Max. plastic bending moment	$M_{pl,y,d}$	NPA[3)]	NPA	NPA	NPA	NPA	NPA	kNm
	$M_{pl,z,d}$	NPA	NPA	NPA	NPA	NPA	NPA	kNm
Max. plastic section moduli	Z_y	NPA	NPA	NPA	NPA	NPA	NPA	mm^3
	Z_z	NPA	NPA	NPA	NPA	NPA	NPA	mm^3
Plastic shear areas	$A_{pl,y}$	NPA	NPA	NPA	NPA	NPA	NPA	mm^2
	$A_{pl,z}$	NPA	NPA	NPA	NPA	NPA	NPA	mm^2
Area bisecting axis position	$f_{y,0}$	NPA	NPA	NPA	NPA	NPA	NPA	mm
	$f_{z,0}$	NPA	NPA	NPA	NPA	NPA	NPA	mm
Plastic shear forces	$V_{pl,y,d}$	NPA	NPA	NPA	NPA	NPA	NPA	kN
	$V_{pl,z,d}$	NPA	NPA	NPA	NPA	NPA	NPA	kN
Plastic axial force	$N_{pl,d}$	NPA	NPA	NPA	NPA	NPA	NPA	kN
Buckling curves	BC_y	c	c	c	c	c	c	-
	BC_z	c	c	c	c	c	c	-

[3)] NPA: No performance assessed

Table C1: Direction of force and arrangement of the drilled plates

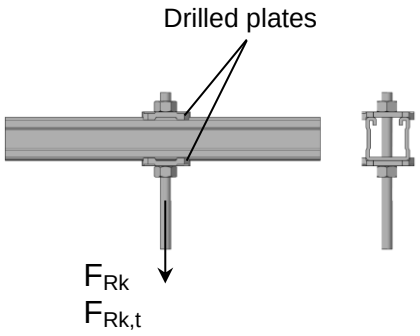
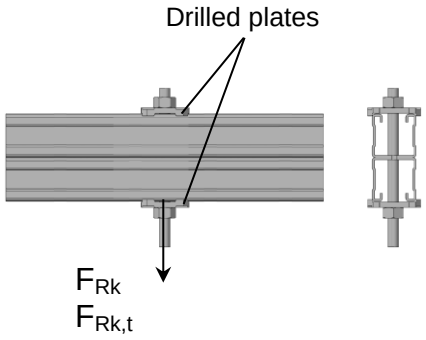
Illutration	Installation channel
	MQ-41/3 MQ-41/3 LL MQ-41 MQ-41-L MQ-21.5
	MQ-41 D

Table C2: Characteristics at ambient temperature

Drilled plates	Installation channel	Characteristic pull-out resistance	Partial safety coefficient[4)]
		F_{Rk} [kN]	γ_M
MQZ-L11 MQZ-L13	MQ-41/3	25.00	1.99
	MQ-41/3 LL		
	MQ-41	18.40	1.75
	MQ-41 D		
	MQ-41-L	11.70	1.40
	MQ-21.5	16.10	1.93

[4)] provided that no other national regulations apply

Hilti drilled plate MQZ-L11 and Hilti drilled plate MQZ-L13	Annex C
Direction of force and arrangement of the drilled plates Characteristics at ambient temperature	

Table D1: Pull-out resistance at elevated temperatures (2 suspension points)
Parameter of regression curve $2*F_{Rk}(t) = c_3 (c_1 + c_2 / t)$

Drilled plates	Installation channel	c_1	c_2	c_3	t_{min} [Minutes]	t_{max} [Minutes]
MQZ-L11 MQZ-L13	MQ-41/3	963.500	76594.354	0.847958	25	150
	MQ-41/3 LL					
	MQ-41	NPA[5)]	NPA	NPA	NPA	NPA
	MQ-41 D					
	MQ-41-L	NPA	NPA	NPA	NPA	NPA
	MQ-21.5	NPA	NPA	NPA	NPA	NPA

Table D2: Pull-out resistance $F_{Rk,t}$ at elevated temperatures[6)] of the single drilled plate

Drilled plates	Installation channel	$F_{Rk,30}$ [N]	$F_{Rk,60}$ [N]	$F_{Rk,90}$ [N]	$F_{Rk,120}$ [N]
MQZ-L11 MQZ-L13	MQ-41/3	1491	949	769	679
	MQ-41/3 LL				
	MQ-41	NPA	NPA	NPA	NPA
	MQ-41 D				
	MQ-41-L	NPA	NPA	NPA	NPA
	MQ-21.5	NPA	NPA	NPA	NPA

[5)] NPA: No performance assessed

[6)] Direction of force and arrangement of the drilled plates see Table C1