



MT SYSTEM SADDLE NUTS

ETA-23/0103 (14.08.2024)





European Technical Assessment

ETA-23/0103 of 14/08/2024

English translation prepared by CSTB - Original version in French language

General Part

Technical Assessment Body issuing the European Technical Assessment:

Centre Scientifique et Technique du Bâtiment (CSTB)

Trade name of the construction product: Hilti saddle nuts

Product family to which the construction product belongs: Products for installation systems for supporting technical building equipment

Manufacturer: Hilti AG
Feldkircherstraße 100
9494 Schaan
FÜRSTENTUM LIECHTENSTEIN

Manufacturing plants: L 1000446, L 1087643 and L 1000485

This European Technical Assessment contains: 33 pages including 30 pages of 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: European Assessment Document (EAD)
280016-00-0602 version June 2020

This Assessment replaces: ETA-23/0103 of 30/06/2023

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Specific Part

1 Technical description of the product

Objects of this European Technical Assessment are the Hilti saddle nuts:

MQA-M10-B, MQA-M12-B and MQA-M16-B saddle nuts consist of a nut centered on a clamping plate made of steel, which are connected to one another by means of a spring element made of PET. The clamping plates have a centered round opening. The nut is used to fasten threaded elements, e.g. threaded rods.

MT-CTR-GS M12 OC, MT-CTR-GS M16 OC, MT-CTR-GL M12 OC and MT-CTR-GL M16 OC are kits. Each kit consisting of a plate with a welded hexagon nut, a hexagon nut and washer, and one U-shaped steel plate with two vertical parallel legs with openings for fastening to the channels. The various distances between the legs allows the usage with Hilti channels MT-70, MT-80, MT-90, MT-90H or MT-100 with Hilti channel connector MT-TFB OC. The upper horizontal part of the U-shaped steel plate has an opening to allow a threaded rod to pass through and to fasten it with the above-mentioned components of the kit.

MT-PCC-G M8/M10 OC, MT-PCC-G M12 OC and MT-PCC-G M16 OC are steel base plates with two long holes arranged symmetrically and a centrally positioned thread connection. They are fixed with two MT-TFB OC Hilti channel connectors to Hilti channels MT-70, MT-80, MT-90, MT-90H or MT-100.

MT-TL M6, MT-TL M6 OC, MT-TL M8, MT-TL M8 OC, MT-TL M12, MT-TL M12 OC, MT-TL M16 and MT-TL M16 OC saddle nuts consists of a U-shaped steel plate with a centric metric thread and an attached plastic part. The metric thread is used to fasten threaded elements.

MT-AS M8, MT-AS M8 OC, MT-AS M10 and MT-AS M10 OC saddle nuts consist of a nut centered on a clamping plate made of steel. Both elements are formed from one piece and are connected by a 3 mm steel bridge. The clamping plates have a centered round opening. The nut is used to fasten threaded elements, e.g. threaded rods.

MT-FP M6, MT-FP M6 OC, MT-FP M8, MT-FP M8 QC, MT-FP M10, MT-FP M10 OC, MT-FP M12, MT-FP M12 OC, MT-FP M16 and MT-FP M16 OC are steel plates in parallelogram shape with one centric opening with metric thread. The opening in the nut is used to fasten threaded elements, e.g. threaded rods.

Annex A describes the dimensions and materials of above-mentioned Hilti saddle nuts.

2 Specification of the intended use

The performance given in Section 3 can only be assumed if the Hilti saddle nuts are used in compliance with the specifications and under boundary conditions set out in Annexes A to G. The test and assessment methods on which this European Technical Assessment is based lead to an assumption of a working life of the Hilti saddle nuts 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 technical building equipment in general,
- c) installations for the support of pipes for the transport of gas/fuel intended for the supply of building heating / cooling systems.
- d) installations for the support of pipes for the transportation of water not intended for human consumption

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

3.1 Safety in case of fire (BWR 2)

No.	Essential characteristic	Performance
1	Reaction to fire	Class A2
2	Resistance under fire exposure for small channel deformations $\epsilon \leq 2\%$	See Annex D, G
3	Resistance under fire exposure for large channel deformations $\epsilon > 2\%$	See Annex E, G

3.2 Safety and accessibility in use (BWR 4)

No.	Essential characteristic	Performance
4	Shape	See Annex A
5	Dimensions	See Annex A
6	Material	See Annex A
7	Characteristic pull-out resistance	See Annex G

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:

Commission Decision N° 96/577/EC as amended by Commission Decision 2002/592/EC:

The system is 1

- In case of intended use b) specified in Section 2:

Commission Decision N° 97/161/EC de la Commission:

The system is 2+

- In case of intended use c) specified in Section 2:

Commission Decision N° 999/472/EC as amended by Commission Decision 2001/596/EC:

The system is 3

- In case of intended use d) specified in Section 2:

Commission Decision N° 999/472/EC as amended by Commission Decision 2001/596/EC:

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

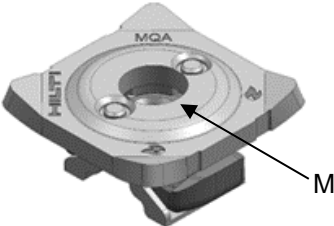
The technical details necessary for the implementation of the system for the assessment and verification of constancy of performance are laid down in the control plan (confidential part of this European Technical Assessment) deposited at Centre Scientifique et Technique du Bâtiment.

The manufacturer shall, on the basis of a contract, involve a notified body approved in the field of supporting systems for issuing the certificate of conformity CE based on the control plan.

The original French version is signed by

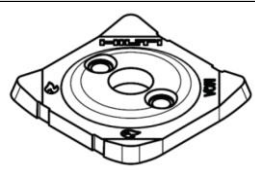
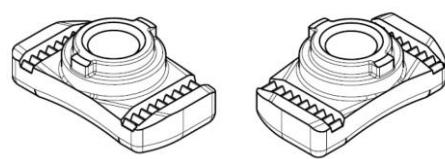
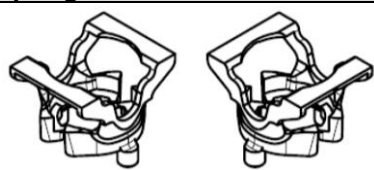
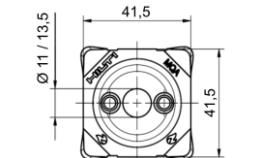
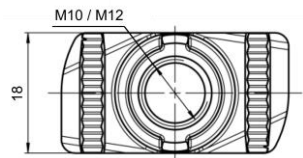
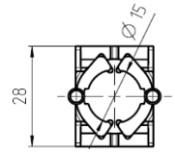
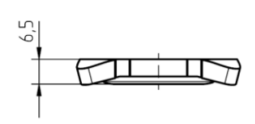
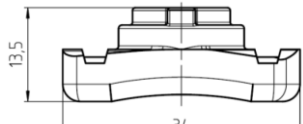
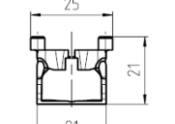
Le chef de division, Loic PAYET

Table A1: Dimensions and materials of Hilti MQA-B saddle nuts

Item number	Designation	M thread	Materials	Illustration
2199452	MQA-M10-B	M10	Plate: DD11 according to DIN EN 10111 ¹⁾ or S235JR according to DIN EN 10025-2, zinc coated Nut: C4C according to DIN EN 10263-2 Plastic part: PET	
2199453	MQA-M12-B	M12		
2199454	MQA-M16-B	M16		

¹⁾ with $235 < R_{eL} < 340 \text{ N/mm}^2$, Deoxidization type: fully deoxidized

Table A2: Dimensions of the components of the MQA-M10-B and MQA-M12-B saddle nuts in mm

Plate	Nut	Spring section
		
		
		

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Product Description
 Dimensions and materials

Annex A1

Table A3: Dimensions of the components of the MQA-M16-B saddle nut in mm

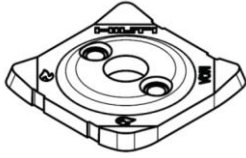
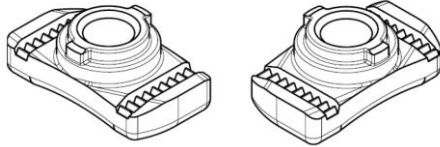
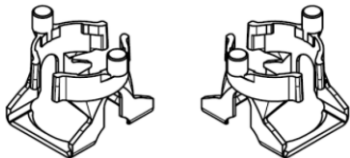
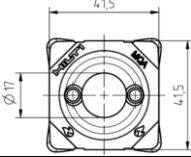
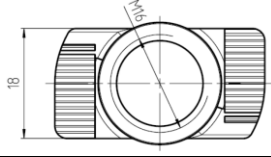
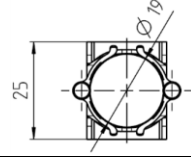
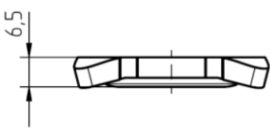
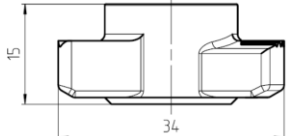
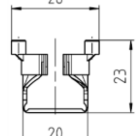
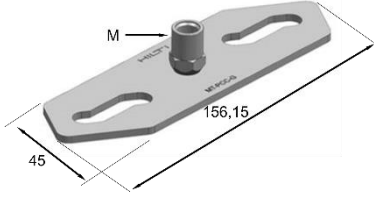
Plate	Nut	Spring section
		
		
		

Table A4: Dimensions and materials of the components of the MT-PCC-G saddle nut in mm

Item number	Designation	M thread	Baseplate thickness	Materials	Illustration (dimensions in mm)
2353801	MT-PCC-G M8/M10 OC	M8 / M10	4 mm	Baseplate: Q355B acc. to GB/T 1591, hot dipped galv.	
2354564	MT-PCC-G M12 OC	M12	4 mm	Connection piece: 9SMN28 acc. to DIN 1651, hot dipped galv.	
2354155	MT-PCC-G M16 OC	M16	6 mm	Connection piece: 9SMN28 acc. to DIN 1651, hot dipped galv.	

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Product Description
 Dimensions and materials

Annex A2

Table A5: Dimensions and materials of the components of the MT-CTR-G saddle nut in inches and mm

Item number	Designation	M thread	Materials	Illustration ¹⁾
2332789	MT-CTR-GS M12 OC	M12		
2332790	MT-CTR-GS M16 OC	M16	U-shape steel plate: Q355B acc. to GB/T 1591 Hot dipped galvanized Hexagonal Nut: Strength class 8 acc. to ISO898-2	
2332793	MT-CTR-GL M12 OC	M12	Washer 12/40 and 16/40 acc. to ISO 7089-200HV Plate: Q235B acc. to GB/T 700 Hot dipped galvanized	
2332796	MT-CTR-GL M16 OC	M16		



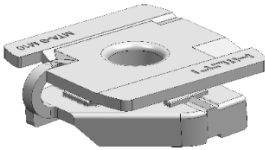
¹⁾ Threaded rod in illustration is not part of the item. The threaded rod is shown to illustrate how the parts of the items are combined.

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Product description
 Dimensions and materials

Annex A3

Table A6: Materials and designation of the MT-TL and MT-AS saddle nuts

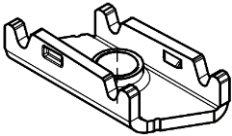
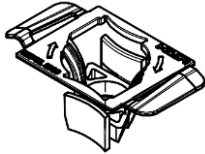
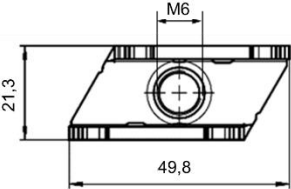
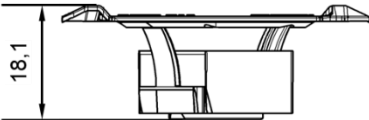

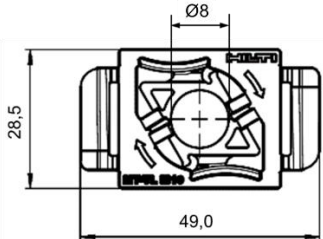
Item number	Designation	Illustration	Materials and coatings
2343283	MT-TL M6		Steel part: S460MC acc. to EN10149-2 or equivalent as defined in HN709 zinc coated Plastic part: Polyamid
2273630	MT-TL M8		
2273632	MT-TL M12		
2273634	MT-TL M16		
2343284	MT-TL M6 OC		Steel part: S460MC acc. to EN10149-2 or equivalent as defined in HN709 zinc coated with organic topcoat Plastic part: Polyamid
2273631	MT-TL M8 OC		
2273633	MT-TL M12 OC		
2273635	MT-TL M16 OC		
2399684	MT-AS M8		S235JR acc. to EN 10025-2 or DD11 MOD as defined in HN705 zinc coated
2399685	MT-AS M10		
2399686	MT-AS M8 OC		S235JR acc. to EN 10025-2 or DD11 MOD as defined in HN705 zinc coated with organic topcoat
2399687	MT-AS M10 OC		

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Product description
 Dimensions and materials

Annex A4

Table A7: Dimensions of components of Hilti MT-TL M6 and MT-TL M6 OC saddle nuts

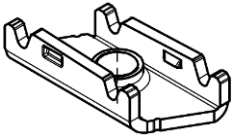
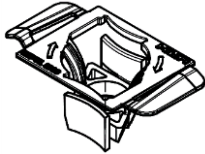
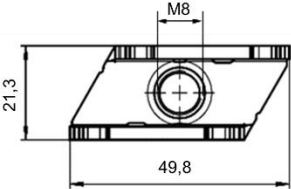
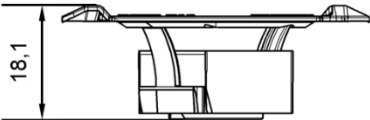

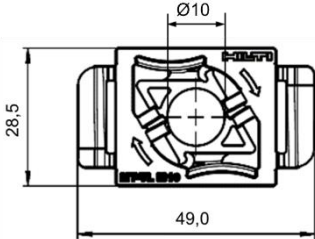
Item number	Designation	Illustration of nut (Dimensions in mm)	Illustration of plastic part (Dimensions in mm)
2343283 2343284	MT-TL M6 MT-TL M6 OC		
			
			

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Product description
 Dimensions and materials

Annex A5

Table A8: Dimensions of components of Hilti MT-TL M8 and MT-TL M8 OC saddle nuts

Item number	Designation	Illustration of nut (Dimensions in mm)	Illustration of plastic part (Dimensions in mm)
2273630 2273631	MT-TL M8 MT-TL M8 OC		
			
			

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Product description
 Dimensions and materials

Annex A6

Table A9: Dimensions of components of Hilti MT-TL M12 and MT-TL M12 OC saddle nuts

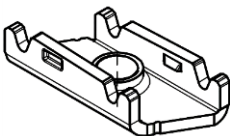

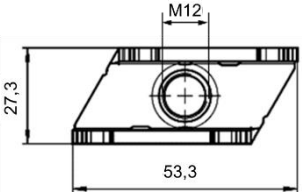
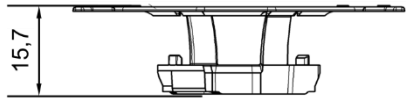

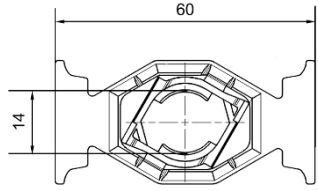
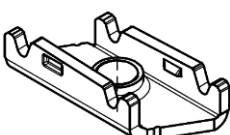

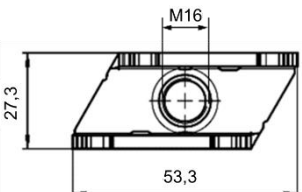
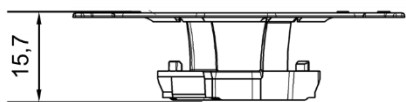

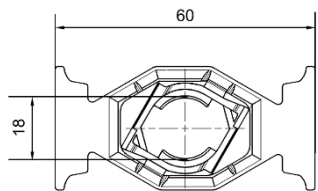
Item number	Designation	Illustration of nut (Dimensions in mm)	Illustration of plastic part (Dimensions in mm)
2273632 2273632	MT-TL M12 MT-TL M12 OC		
			
			

Table A10: Dimensions of components of Hilti MT-TL M16 and MT-TL M16 OC saddle nuts

Item number	Designation	Illustration of nut (Dimensions in mm)	Illustration of plastic part (Dimensions in mm)
2273634 2273635	MT-TL M16 MT-TL M16 OC		
			
			

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Product description
 Dimensions and materials

Annex A7

Table A11: Dimensions of components of Hilti MT-AS M8, MT-AS M8 OC, MT-AS M10 and MT-AS M10 OC, saddle nuts

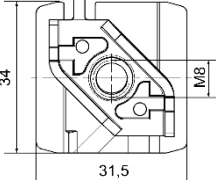
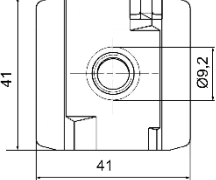
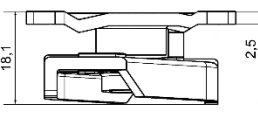
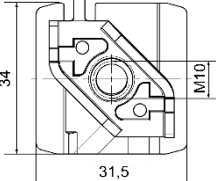
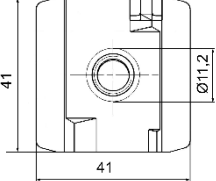
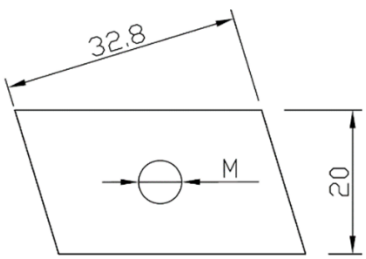
Item number	Designation	Illustration of nut (Dimensions in mm)	Illustration of steel plate (Dimensions in mm)	Illustration side view (Dimensions in mm)
2399684 2399686	MT-AS M8 MT-AS M8 OC			
2399685 2399687	MT-AS M10 MT-AS M10 OC			

Table A12: Dimensions of components of Hilti MT-FP M8, MT-FP M8 OC, MT-FP M10, MT-FP M10 OC, MT-FP M12, MT-FP M12 OC, MT-FP M16 and MT-FP M16 OC saddle nuts

Item number	Designation	Material	Illustration (Dimensions in mm)
2273653 2273655 2273657 2273659 2273671	MT-FP M6 MT-FP M8 MT-FP M10 MT-FP M12 MT-FP M16	Steel Q235B acc. to GB/T 700; galvanized	 <p>6 mm thickness</p>
2273654 2273656 2273658 2273670 2273672	MT-FP M6 OC MT-FP M8 OC MT-FP M10 OC MT-FP M12 OC MT-FP M16 OC	Steel Q235B acc. to GB/T 700; hot dip galvanized	

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Product description
 Dimensions and materials

Annex A8

Specifications of intended use

- Hilti saddle nuts are used to transfer building services component loads such as ducts and equipment for sprinklers, water, heating, cooling, ventilation, electrical and other systems. Hilti saddle nuts are performing this loadbearing function under the conditions described in Section 2 of this European Technical Assessment.
- Hilti saddle nuts MQA-M10-B, MQA-M12-B and MQA-M16-B are performing this loadbearing function at ambient temperature and in case of fire in combination with Hilti MQ and MT open profile channels as listed in Annex B4 to Annex B7. Hilti saddle nuts MQA-M10-B, MQA-M12-B and MQA-M16-B are deployed for the fixation of threaded rods in installation systems in combination with hexagonal nuts. They must be installed according to the manufacturer's instructions for use as shown in figure A1.

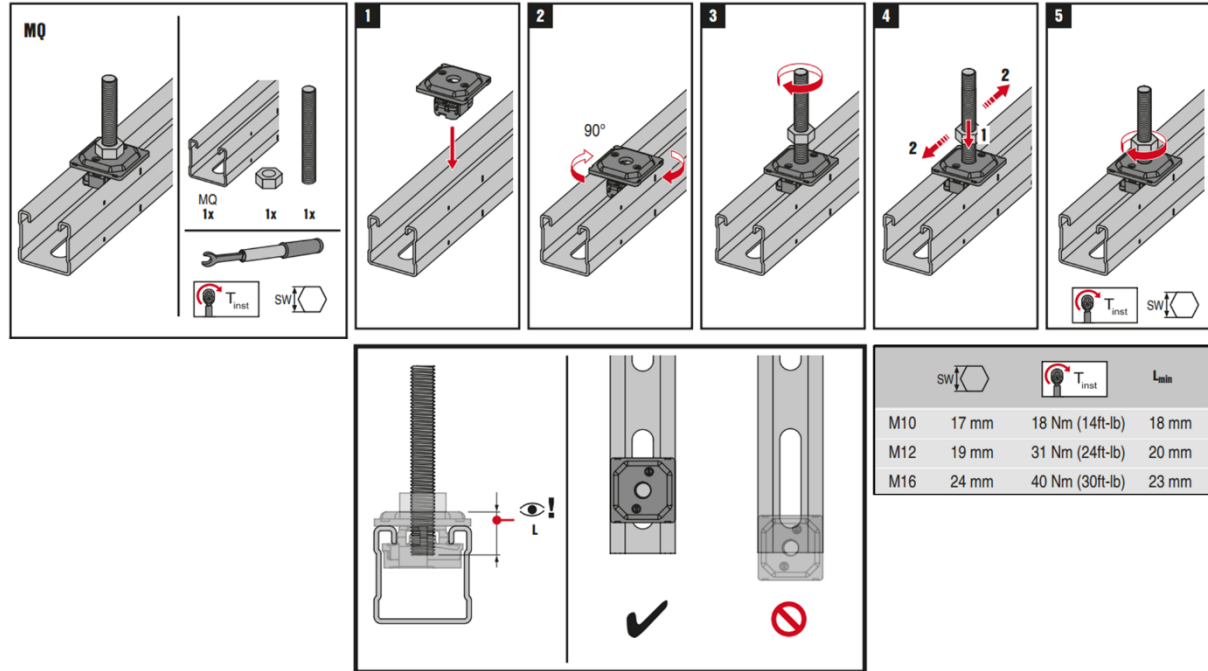


Figure A1: Installation instructions of the MQA-B saddle nut in conjunction with channel, hex-nut and threaded rod.

- Hilti threaded rods of strength class ≥ 4.8 in accordance with DIN 976-1 as per Table B1 may be connected to saddle nuts MQA-M10-B, MQA-M12-B and MQA-M16-B and fixed with hexagonal nuts of strength class ≥ 8 in accordance with ISO 4032 as per Table B2.
- Hilti saddle nuts MT-TL M6, MT-TL M6 OC, MT-TL M8, MT-TL M8 OC, MT-TL M12, MT-TL M12 OC, MT-TL M16 and MT-TL M16 OC are deployed for the fixation of threaded rods, bolts and screws in installation systems in combination with hexagonal nuts. Installation torques are described in table A1.

Designation	Torque in Nm	
	hex bolt DIN 933 8.8	Threaded rod ≥ 4.8
MT-TL M6, MT-TL M6 OC	7	7
MT-TL M8, MT-TL M8 OC	30	10
MT-TL M12, MT-TL M12 OC	60	30
MT-TL M16, MT-TL M16 OC	90	50

Table A1: Application depending installation torque of MT-TL saddle nuts

- The distance between the center of Hilti saddle nuts MT-TL M6, MT-TL M6 OC, MT-TL M8, MT-TL M8 OC, MT-TL M12, MT-TL M12 OC, MT-TL M16 and MT-TL M16 OC and the end of the channel must be at least 25 mm.

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B1

- Hilti saddle nuts MT-CTR-GS M12 OC and MT-CTR-GS M16 OC are used for suspending Hilti channels MT-70 or MT-80 using two Hilti thread forming bolt MT-TFB OC, see Figure A2 (left).
- Hilti saddle nuts MT-CTR-GL M12 OC and MT-CTR-GL M16 OC are used for suspending Hilti channels MT-80, MT-90, MT-90H or MT-100 using two Hilti thread forming bolt MT-TFB OC, see Figure A2 (right).

Figure A2: Assembly of Hilti MT-CTR saddle nut with Hilti MT channel

- The Hilti MT-PCC-G M8/M10 OC, MT-PCC-G M12 OC and MT-PCC-G M16 OC saddle nuts are used in combination with Hilti channels MT-70, MT-80, MT-90, MT-90H or MT-100. Both items are fixed with two Hilti thread forming bolt MT-TFB OC, see figure A3.

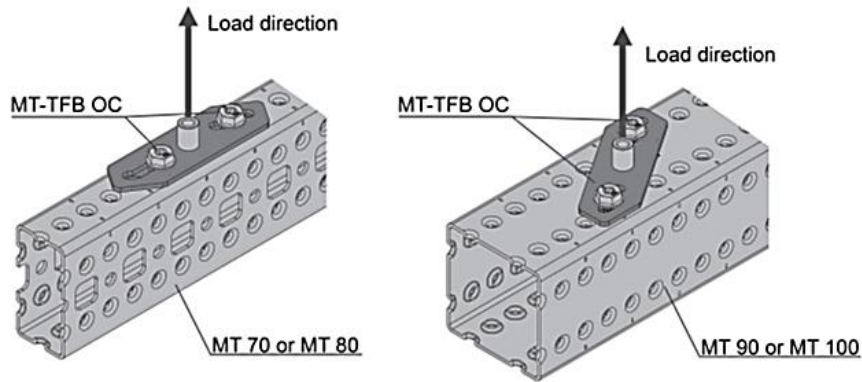


Figure A3: Assembly of Hilti MT-PCC-G saddle nut with Hilti MT channel

- MT-TFB OC thread forming bolts are positioned through the appropriate openings of MT-CTR-GS, MT-CTR-GL and MT-PCC-G. For the bolt MT-TFB OC a torque of 60 Nm applies.
- MT-FP M6, MT-FP M6 OC, MT-FP M8, MT-FP M8 QC, MT-FP M10, MT-FP M10 OC, MT-FP M12, MT-FP M12 OC, MT-FP M16 and MT-FP M16 OC are always used in combination with e.g. washers or other building equipment products with ≥ 1.5 mm material thickness.
- The assembly of MT-FP saddle nuts with the associated members is shown in figure A3.

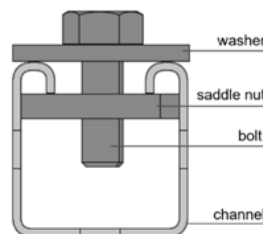


Figure A3: Assembly of Hilti MT-FP saddle nuts

- The installation of MT-FP saddle nuts must follow the instructions for use as shown in figure A4.

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B2

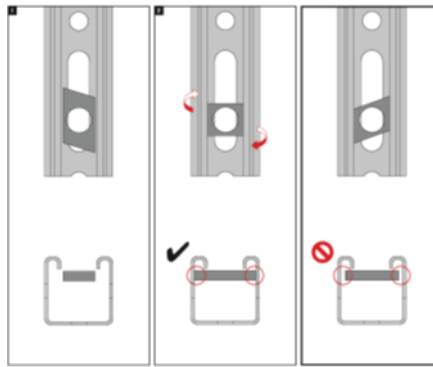


Figure A4: Installation and positioning of MT-FP saddle nuts

- The required torques of Hilti MT-FP saddle nuts in combination with Hilti installation channels are shown in table A2.

Designation	Torque in Nm
MT-FP M6, MT-FP M6 OC	5
MT-FP M8, MT-FP M8 OC	9
MT-FP M10, MT-FP M10 OC	15
MT-FP M12, MT-FP M12 OC, MT-FP M16, MT-FP M16 OC	20

Table A2: Installation torque of MT-FP saddle nuts


- The required torques of Hilti saddle nuts may be applied with electrical devices or with a torque wrench.
- The saddle nuts must be installed by appropriately qualified personnel and under the supervision of the site manager. The installation instruction of the manufacturer applies.
- Information on resistance at ambient temperature and in case of fire applies to static and centric actions. The time values in conjunction with the resistance values at elevated temperatures refer to the boundary conditions of the standard Temperature / Time curve (STTC) according to EN 1363-1.
- Prior to installation, it must be ensured that the supported component, the anchoring of the threaded rod to the base material and the base material itself are suitable to withstand the resistance values of the installation system and that they have a fireproof certificate.

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B3

Table B1: Dimensions and materials of Hilti threaded rods for use with Hilti saddle nuts

Item number	Designation	M thread	L [mm]	Materials	Illustration
339795	M10x1000 4.8	M10	1000	Strength class 4.8 in accordance with DIN976-1, zinc coated	
339796	M10x2000 4.8	M10	2000		
216418	M10x3000 4.8	M10	3000		
339797	M12x1000 4.8	M12	1000		
216420	M12x2000 4.8	M12	2000		
216421	M12x3000 4.8	M12	3000		
216422	M16x1000 4.8	M16	1000		
216423	M16x2000 4.8	M16	2000		
216424	M16x3000 4.8	M16	3000		
407497	M10x1000 8.8	M10	1000	Strength class 8.8 in accordance with DIN976-1, zinc coated	
2008566	M10x3000 8.8	M10	3000		
407498	M12x1000 8.8	M12	1000		
2008567	M12x3000 8.8	M12	3000		
407499	M16x1000 8.8	M16	1000		
2008568	M16x3000 8.8	M16	3000		
2390279	M10x1000 A4-70	M10	1000	Strength class A4-70 in accordance with DIN976-1, Stainless steel	
2390279	M10x3000 A4-70	M10	3000		
2390280	M12x1000 A4-70	M12	1000		
2390286	M12x3000 A4-70	M12	3000		
2390281	M16x1000 A4-70	M16	1000		
2390193	M16x3000 A4-70	M16	3000		

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B4

Table B2: Dimensions and materials of Hilti hexagonal nuts for use with Hilti saddle nuts

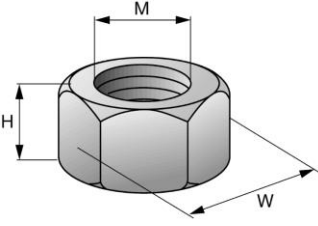
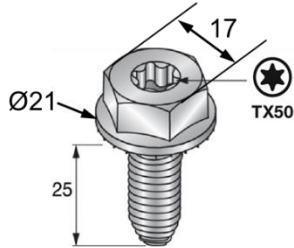
Illustration	Item number	Designation	M thread	W [mm]	H [mm]	Material
	216466	M10 hexagonal nut	M10	17	8	Strength class 8 in accordance with DIN 934, zinc coated
	2184554	M12 hexagonal nut	M12	19	10	
	2184506	M16 hexagonal nut	M16	24	13	
	2184474	M10 hexagonal nut	M10	17	8	Strength class 70 in accordance with DIN 934, stainless steel
	2184475	M12 hexagonal nut	M12	19	10	
	2184476	M16 hexagonal nut	M16	24	13	

Table B3: Dimensions and materials of Hilti MT-TFB OC thread forming bolt

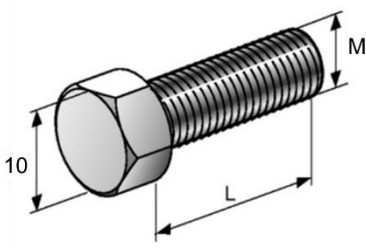
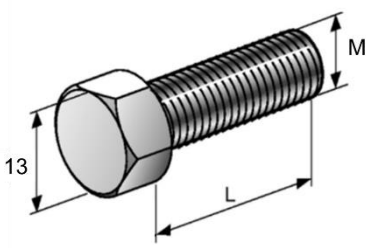
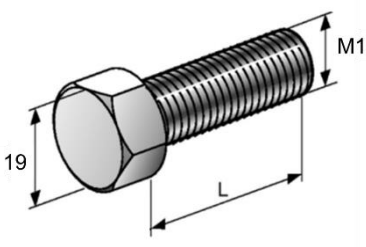
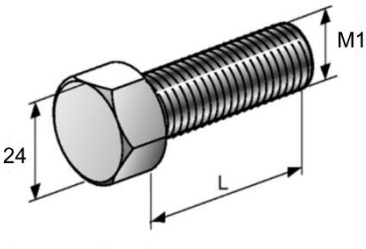
Item number	Designation	Materials and coatings	Illustration (Dimensions in mm)
2272084	MT-TFB OC	C10B21 acc. to SAE J403, Surface hardness min. 530 HV, Core hardness min. 32-39 HRC zinc coated with organic topcoat	

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B5

Table B4: Dimensions and materials of HILTI metric hexagonal bolts for use with saddle nuts MT-TL product family M6, M8, M12 and M16

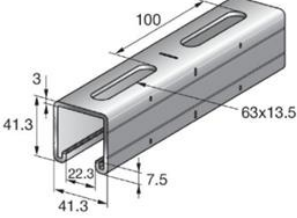
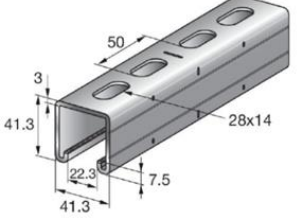
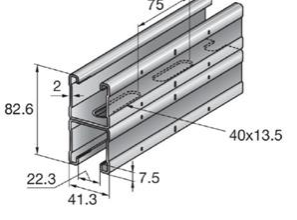
Illustration (Dimensions in mm)	Item number	Designation	L [mm]	Materials and coatings	Saddle nut
	2184488	M6x25 Zn DIN 933 8.8	25	strength class 8.8 in accordance with EN ISO 898-1, zinc coated	MT-TL M6 MT-TL M6 OC
	2184489	M6x40 Zn DIN 933 8.8	40		
	2184492	M8x25 Zn DIN 933 8.8	25	strength class 8.8 in accordance with EN ISO 898-1, zinc coated	MT-TL M8 MT-TL M8 OC
	2184305	M8x30 Zn DIN 933 8.8	30		
	2184553	M12x25 Zn DIN 933 8.8	25	strength class 8.8 in accordance with EN ISO 898-1, zinc coated	MT-TL M12 MT-TL M12 OC
	2184499	M12x35 Zn DIN 933 8.8	35		
	2184501	M16x30 Zn DIN 933 8.8	30	strength class 8.8 in accordance with EN ISO 898-1, zinc coated	MT-TL M16 MT-TL M16 OC
	2184485	M16x35 Zn DIN 933 8.8	35		

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B6

Table B5: Dimensions and materials of Hilti MQ-41/3 3M, MQ-41/3 6M, MQ-41/3 3M LL, MQ-41/3 6M LL, MQ-41 D 3M and MQ-41 D 6M installation channels for use with Hilti MQA-B saddle nuts

Illustration ²⁾	Item number	Designation	Materials and coatings
	369596	MQ-41/3 3M	S250GD+Z275-M-A-C according to DIN EN 10346
	369597	MQ-41/3 6M	
	2048102	MQ-41/3 3M LL	S250GD+Z275-M-A-C according to DIN EN 10346
	2048103	MQ-41/3 6M LL	
 <p data-bbox="164 1200 611 1379">Two profiles of MQ-41 D channel are connected in the area of the slotted or round holes in the back of the channels in a shape-fitting and force-fitting way as a kind of riveted connection.</p>	369603	MQ-41 D 3m	S250GD+Z275-M-A-C according to DIN EN 10346
	369604	MQ-41 D 6m	

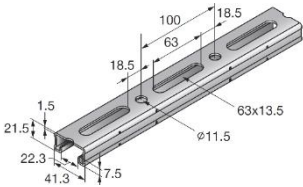
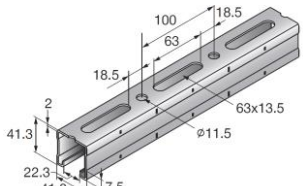
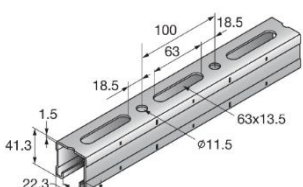
²⁾ Dimensions in mm

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B7

Table B6: Dimensions and materials of Hilti MQ-21.5 6m, MQ-21.5 3m, MQ-21.5 2m, MQ-41 6m, MQ-41 3m, MQ-41 2m, MQ-41-L 6m, MQ-41-L 3m and MQ-41-L 2m installation channels for use with Hilti MQA-B saddle nuts

Figure ³⁾	Item number	Designation	Materials and coatings
	2184773	MQ-21.5 6m	S280GD+Z140-M-A-C according to DIN EN 10346
	2184772	MQ-21.5 3m	
	2184771	MQ-21.5 2m	
	369592	MQ-41 6m	S250GD+Z275-M-A-C according to DIN EN 10346
	369591	MQ-41 3m	
	304559	MQ-41 2m	
	2141964	MQ-41-L 6m	S250GD+Z140-M-A-C according to DIN EN 10346
	2141965	MQ-41-L 3m	
	2141966	MQ-41-L 2m	

³⁾ Dimensions in mm

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B8

Table B7: Dimensions and materials of Hilti MT-30 S, MT-30, MT-30 S OC, MT-30 OC, MT-40 S, MT-40, MT-40 S OC and MT-40 OC installation channels for use with Hilti MQA-B saddle nuts

Figure ⁴⁾	Item number	Designation	Length [m]	Materials and coatings
	2268497	MT-30 S	3	S280GD or equivalent as defined in HN704 + Z275-M-A-C acc. to EN 10346
	2268498	MT-30	6	
	2268499	MT-30 S OC	3	S280GD or equivalent as defined in HN704 + ZM310-A-C acc. to EN 10346
	2268500	MT-30 OC	6	
	2268505	MT-40 S	3	S280GD or equivalent as defined in HN704 + Z275-M-A-C acc. to EN 10346
	2268506	MT-40	6	
	2268507	MT-40 S OC	3	S280GD or equivalent as defined in HN704 + ZM310-A-C acc. to EN 10346
	2268508	MT-40 OC	6	

⁴⁾ Dimensions in inches and mm

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B9

Table B8: Dimensions and materials of Hilti MT-50 S, MT-50, MT-50 S OC, MT-50 OC, MT-40D S, MT-40D, MT-40D S OC, MT-40D OC installation channels for use with Hilti MQA-B saddle nuts

Figure ⁵⁾	Item number	Designation	Length [m]	Materials and coatings
	2268509	MT-50 S	3	S280GD or equivalent as defined in HN704 +
	2268510	MT-50	6	Z275-M-A-C acc. to EN 10346
	2268511	MT-50 S OC	3	S280GD or equivalent as defined in HN704 +
	2268512	MT-50 OC	6	ZM310-A-C acc to. EN 10346
	2362808	MT-50 U	6	S280GD or equivalent as defined in HN704 + Z275-M-A-C acc. to EN 10346
<p>Two profiles of MT-40 OC channel are connected in the area of the slotted or round holes in the back of the channels in a shape-fitting and force-fitting way as a kind of riveted connection.</p>	2268517	MT-40D S	3	S280GD or equivalent as defined in HN704 +
	2268518	MT-40D	6	Z275-M-A-C acc. to EN 10346
	2268519	MT-40D S OC	3	S280GD or equivalent as defined in HN704 +
	2268520	MT-40D OC	6	ZM310-A-C acc to. EN 10346

⁵⁾ Dimensions in inches and mm

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B10

Table B9: Dimensions and materials of Hilti MT-70 S OC, MT-70 OC, MT-80 S OC, MT-80 OC installation channels for use with Hilti MT-PCC-C, MT-CTR-GS and MT-CTR-GL saddle nuts

Figure ⁶⁾	Item number	Designation	Length [m]	Materials and coatings
	2268364	MT-70 S OC	3	S350GD+ ZM310-A-C acc. to EN 10346
	2268365	MT-70 OC	6	
	2268366	MT-80 S OC	3	S350GD+ ZM310-A-C acc. to EN 10346
	2268367	MT-80 OC	6	
	2268368	MT-90 S OC	3	S350GD+ ZM310-A-C acc. to EN 10346
	2268369	MT-90 OC	6	
	2268490	MT-100 S OC	3	S350GD+ ZM310-A-C acc. to EN 10346
	2268491	MT-100 OC	6	

⁶⁾ Dimensions in inches and mm

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Requirements for performance assessment

Annex B11

Table C1: Characteristic pull-out resistance at ambient temperatures of Hilti MQA-B saddle nuts

Pipe ring saddle	Installation channel	Characteristic pull-out resistance
		F_{Rk}
		[kN]
MQA-M10-B	MQ-41/3	23,26
	MQ-41/3 LL	
	MQ-41	15,08
	MQ-41 D	
	MQ-41-L	7,39
	MQ-21.5	7,09
MQA-M12-B	MQ-41/3	20,63
	MQ-41/3 LL	
	MQ-41	15,92
	MQ-41 D	
	MQ-41-L	8,02
	MQ-21.5	6,93
MQA-M16-B	MQ-41/3	21,70
	MQ-41/3 LL	
	MQ-41	11,79
	MQ-41 D	
	MQ-41-L	6,89
	MQ-21.5	6,29
MQA-M10-B MQA-M12-B MQA-M16-B	MT-30 MT-30 OC MT-40 MT-40 S MT-40 S OC MT-40 OC MT-40D MT-40D S MT-40D OC MT-50 MT-50 S MT-50 S OC MT-50 OC	NPA ⁷⁾

⁷⁾ NPA: No performance assessed

All characteristic resistances for ambient temperatures do not consider deflections.

Partial safety factor for design resistance is $\gamma_M = F_{Rk} / F_{Rd}$ or $\gamma_M = M_{Rk} / M_{Rd}$.

For design resistances the manufacturer's specifications and national regulations must be observed.

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Characteristic pull-out resistance of MQA-B at ambient temperatures

Annex C1

Table D1: Parameter of regression curve $F_{Rk,t} = c_3 (c_1 + c_2 / t)$ for $\epsilon_{B,0a} \leq 2 \%$ of Hilti MQA-B saddle nuts

Designation	Installation channel	c_1	c_2	c_3	t_{min} [min]	t_{max} [min]
MQA-M10-B MQA-M12-B	MQ-41/3	695,324	27657,410	0,704	20	150
	MQ-41/3 LL					
	MQ-41	345,949	28750,936	0,713	20	120
	MQ-41D					
	MQ-41-L	-462,03	35853,38	0,8808	30	33
	MQ-21.5	110,27	19232,88	0,9786	30	48
	MT-30 ⁸⁾	270,9122	21855,373	0,797211	22	130
	MT-40 ⁹⁾					
	MT-40D ⁸⁾					
	MT-50 ⁹⁾	449,2781	33887,6065	0,845128	29	131
MQA-M16-B	MQ-41/3	758,416	38174,329	0,844	26	130
	MQ-41/3 LL					
	MQ-41	345,949	28750,936	0,713	26	120
	MQ-41D					
	MQ-41-L	-462,03	35853,38	0,8808	30	33
	MQ-21.5	110,27	19232,88	0,9786	30	48
	MT-30 ⁸⁾	16,1699	26899,3433	0,723396	24	150
	MT-40 ⁹⁾					
	MT-40D ⁸⁾					
	MT-50 ⁹⁾	326,9387	36881,5484	0,949819	41	130

⁸⁾ independent of production length and coating

⁹⁾ independent of production length, coating and presence of slotted or round holes

Designation

$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Parameter of pull-out regression curve of MQA-B for $\epsilon_{B,0a} \leq 2 \%$ in case of fire

Annex D1

Table D2: Pull-out resistance $F_{Rk,t}$ in case of fire after $t = 30, 60, 90$ and 120 minutes and $\epsilon_{B,\theta a} \leq 2\%$ of Hilti MQA-B saddle nuts

Designation	Installation channel	$F_{Rk,30}$ [N]	$F_{Rk,60}$ [N]	$F_{Rk,90}$ [N]	$F_{Rk,120}$ [N]
MQA-M10-B MQA-M12-B	MQ-41/3	1138	813	705	651
	MQ-41/3 LL				
	MQ-41	930	589	475	NPA ¹⁰⁾
	MQ-41D				
	MQ-41-L	646	NPA	NPA	NPA
	MQ-21.5	735	NPA	NPA	NPA
	MT-30 ¹¹⁾	796,7	506,4	409,6	361,2
	MT-40 ¹²⁾				
	MT-40D ¹¹⁾				
	MT-50 ¹²⁾	1334,3	857	697,9	618,4
MQA-M16-B	MQ-41/3	1710	1176	998	909
	MQ-41/3 LL				
	MQ-41	930	589	475	NPA
	MQ-41D				
	MQ-41-L	646	NPA	NPA	NPA
	MQ-21.5	735	NPA	NPA	NPA
	MT-30 ¹¹⁾	660,3	336,0	227,9	173,9
	MT-40 ¹²⁾				
	MT-40D ¹¹⁾				
	MT-50 ¹²⁾	1478,2	894,4	699,8	602,5

¹⁰⁾ NPA: No performance assessed

¹¹⁾ independent of production length and coating

¹²⁾ independent of production length, coating and presence of slotted or round holes

Designation

$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Pull-out resistance of MQA-B for $\epsilon_{B,\theta a} \leq 2\%$ in case of fire

Annex D2

Table E1: Parameter of regression curve $F_{Rk,t} = c_3 (c_1 + c_2 / t)$ for $\epsilon_{B,0a} > 2\%$ of Hilti MQA-B saddle nuts

Designation	Installation channel	C ₁	C ₂	C ₃	t _{min} [min]	t _{max} [min]
MQA-M10-B	MQ-41/3	445,338	18381,52	0,917	26	130
	MQ-41/3 LL					
MQA-M12-B	MQ-41/3	434,765	24088,663	0,872	26	123
	MQ-41/3 LL					
MQA-M10-B MQA-M12-B	MQ-41	255,989	15310,519	0,865	22	120
	MQ-41D					
	MQ-41-L	102,97	16294,33	0,9344	21	60
	MQ-21.5	406,83	11709,31	0,9900	33	49
	MT-30 ¹³⁾	39,8267	29669,8577	0,730085	23	130
	MT-40 ¹⁴⁾					
	MT-40D ¹³⁾					
MT-50 ¹⁴⁾	516,5954	21842,9458	0,739941	17	150	
MQA-M16-B	MQ-41/3	434,382	19535,05	0,907	22	139
	MQ-41/3 LL					
	MQ-41	255,989	15310,519	0,865	22	120
	MQ-41D					
	MQ-41-L	NPA ¹⁵⁾	NPA	NPA	NPA	NPA
	MQ-21.5	NPA	NPA	NPA	NPA	NPA
	MT-30 ¹³⁾	-246,8885	34576,4287	0,440543	25	123
	MT-40 ¹⁴⁾					
	MT-40D ¹³⁾					
MT-50 ¹⁴⁾	333,7164	18570,4336	0,712119	19	114	

¹³⁾ independent of production length and coating

¹⁴⁾ independent of production length, coating and presence of slotted or round holes

¹⁵⁾ NPA: No performance assessed

Designation

F_{Rk,t} Resistance after an exposure time t in case of fire [N]

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Parameter of pull-out regression curve of MQA-B for $\epsilon_{B,0a} > 2\%$ in case of fire

Annex E1

Table E2: Pull-out resistance $F_{Rk,t}$ in case of fire after $t = 30, 60, 90$ and 120 minutes and $\epsilon_{B,\theta a} > 2\%$ of Hilti MQA-B saddle nuts

Designation	Installation channel	$F_{Rk,30}$ [N]	$F_{Rk,60}$ [N]	$F_{Rk,90}$ [N]	$F_{Rk,120}$ [N]
MQA-M10-B	MQ-41/3	970	689	595	549
	MQ-41/3 LL				
MQA-M12-B	MQ-41/3	1080	729	613	554
	MQ-41/3 LL				
MQA-M10-B MQA-M12-B	MQ-41	663	442	369	NPA ¹⁸⁾
	MQ-41D				
	MQ-41-L	604	NPA	NPA	NPA
	MQ-21.5	789	NPA	NPA	NPA
	MT-30 ¹⁶⁾	751,1	390,1	269,8	209,6
	MT-40 ¹⁷⁾				
	MT-40D ¹⁶⁾				
MT-50 ¹⁷⁾	921	651,6	561,8	516,9	
MQA-M16-B	MQ-41/3	984	689	590	541
	MQ-41/3 LL				
	MQ-41	663	442	369	NPA
	MQ-41D				
	MQ-41-L	NPA	NPA	NPA	NPA
	MQ-21.5	NPA	NPA	NPA	NPA
	MT-30 ¹⁶⁾	399	145,1	60,5	NPA
	MT-40 ¹⁷⁾				
	MT-40D ¹⁶⁾				
	MT-50 ¹⁷⁾	678,5	458,1	384,6	NPA

¹⁶⁾ independent of production length and coating

¹⁷⁾ independent of production length, coating and presence of slotted or round holes

¹⁸⁾ NPA: No performance assessed

Designation

$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Pull-out resistance of MQA-B for $\epsilon_{B,\theta a} > 2\%$ in case of fire

Annex E2

Table F1: Resistance $F_{Rk,t}$ of Hilti MT-CTR-GS M12 OC and MT-CTR-GS M16 OC saddle nuts in case of fire after $t = 30, 60, 90$ and 120 minutes in combination with threaded rod strength class ≥ 8.8

Designation	Installation channel	$F_{Rk,30}$ [N]	$F_{Rk,60}$ [N]	$F_{Rk,90}$ [N]	$F_{Rk,120}$ [N]
MT-CTR-GS M12 OC	MT-70 OC / S OC	4015,3	2117,5	1484,8	1168,5
	MT-80 OC / S OC				
MT-CTR-GS M16 OC	MT-70 OC / S OC				
	MT-80 OC / S OC				
MT-CTR-GL M12 OC	MT-70 OC / S OC	NPA ¹⁹⁾	NPA	NPA	NPA
	MT-80 OC / S OC				
MT-CTR-GL M12 OC	MT-70 OC / S OC	NPA	NPA	NPA	NPA
	MT-80 OC / S OC				

¹⁹⁾ NPA: No performance assessed

Designation

$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Pull-out resistance of MT-CTR-GS in case of fire in combination with threaded rod strength class ≥ 8.8

Annex F1

Table G1: Characteristic resistance of Hilti MT-PCC-G M8/M10 OC, MT-PCC-G M12 OC, MT-PCC-G M16 saddle nuts at ambient temperature strength class ≥ 4.8

Designation	Threaded rod	Installation channel	Characteristic resistance $F_{z,Rk}$ in kN
MT-PCC-G M8 / M10 OC	M8	MT-70 S OC, MT-70 OC,	15,87
	M10	MT-80 S OC, MT-80 OC	26,03
MT-PCC-G M12 OC	M12	MT-90 S OC, MT-90 OC,	26,20
MT-PCC-G M16 OC	M16	MT-100 S OC, MT-100 OC	21,55

Designation

$F_{z,Rk}$ Resistance in direction of local z-Axis

All characteristic resistances for ambient temperatures do not consider deflections.

Partial safety factor for design resistance is $\gamma_M = F_{Rk} / F_{Rd}$ or $\gamma_M = M_{Rk} / M_{Rd}$.

For design resistances the manufacturer's specifications and national regulations must be observed.

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Pull-out and shear resistance of MT-PCC-G at ambient temperature

Annex G1

Table G2: Pull-out resistance $F_{Rk,t}$ in case of fire after $t = 30, 60, 90$ and 120 minutes for small and large channel deformations and inclination between 0° and 45° in combination with threaded rod strength class ≥ 4.8

Designation	Installation channel	$F_{Rk,30}$ [N]	$F_{Rk,60}$ [N]	$F_{Rk,90}$ [N]	$F_{Rk,120}$ [N]
MT-PCC-G M8 / M10 OC	MT-70 OC / S OC	899,6	756,0	708,2	684,2
	MT-80 OC / S OC				
MT-PCC-G M12 OC MT-PCC-G M16 OC	MT-70 OC / S OC	1740,7	1187,7	1003,3	911,2
	MT-80 OC / S OC				

Designation

$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Pull-out resistance of MT-PCC-G in case of fire for small and large channel deformations and inclination between 0° and 45° in combination with threaded rod strength class ≥ 4.8

Annex G2

Table H1: Characteristic resistance of Hilti MT-TL saddle nuts at ambient temperature in combination with Hilti metric bolts or threaded rods strength class ≥ 4.8

Saddle nut	Hilti installation channel (all lengths and coating)	Characteristic pull-out resistance $F_{y,Rk}$ in kN
MT-TL M6 MT-TL M6 OC	MT-30 MT-40	6,6
MT-TL M8 MT-TL M8 OC	MT-30 MT-40	15,67
MT-TL M12 MT-TL M12 OC	MT-50 MT-60	13,81
MT-TL M16 MT-TL M16 OC	MT-40D	14,20

Designation

$F_{z,Rk}$ Resistance in direction of local z-Axis

All characteristic resistances for ambient temperatures do not consider deflections.

Partial safety factor for design resistance is $\gamma_M = F_{Rk} / F_{Rd}$ or $\gamma_M = M_{Rk} / M_{Rd}$.

For design resistances the manufacturer's specifications and national regulations must be observed.

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Pull-out and shear resistance of MT-TL at ambient temperature

Annex H1

Table I1: Characteristic resistance of Hilti MT-AS saddle nuts at ambient temperature in combination with Hilti metric bolts or threaded rods strength class ≥ 4.8

Saddle nut	Hilti installation channel (all lengths and coating)	Characteristic pull-out resistance $F_{y,Rk}$ in kN
MT-AS M8 MT-AS M8 OC	MT-30 MT-40 MT-50	5,19
MT-AS M10 MT-AS M10 OC	MT-50 U MT-60 MT-40D	5,53

Designation

$F_{z,Rk}$ Resistance in direction of local z-Axis

All characteristic resistances for ambient temperatures do not consider deflections.

Partial safety factor for design resistance is $\gamma_M = F_{Rk} / F_{Rd}$ or $\gamma_M = M_{Rk} / M_{Rd}$.

For design resistances the manufacturer's specifications and national regulations must be observed.

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Pull-out and shear resistance of MT-AS at ambient temperature

Annex I1

Table J1: Characteristic resistance of Hilti MT-FP saddle nuts at ambient temperature in combination with metric bolts or threaded rods strength class ≥ 4.8

Saddle nut	Hilti installation channel (all lengths and coating)	Characteristic pull-out resistance $F_{z,Rk}$ in kN
MT-FP M6 MT-FP M6 OC		3,16
MT-FP M8 MT-FP M8 OC		4,40
MT-FP M10 MT-FP M10 OC		4,02
MT-FP M12 MT-FP M12 OC		4,72
MT-FP M16 MT-FP M16 OC		3,71

Designation

$F_{z,Rk}$ Resistance in direction of local z-Axis

All characteristic resistances for ambient temperatures do not consider deflections.

Partial safety factor for design resistance is $\gamma_M = F_{Rk} / F_{Rd}$ or $\gamma_M = M_{Rk} / M_{Rd}$.

For design resistances the manufacturer's specifications and national regulations must be observed.

Hilti saddle nuts product families MQA-B, MT-PCC-G, MT-TL, MT-AS, MT-FP and MT-CTR-GS

Pull-out and shear resistance of MT-FP at ambient temperature

Annex J1