

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-18/0131
of 9 July 2018

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 threaded rods AM10 x L 4.8, AM12 x L 4.8 and
AM16 x L 4.8

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 1000405

This European Technical Assessment
contains

11 pages including 7 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

**European Technical Assessment
ETA-18/0131**

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Specific Part

1 Technical description of the product

Objects of this European Technical Assessment are the Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 and AM16 x L 4.8. The threaded rods are made of steel with the metric threads M10, M12 and M16. They are delivered in lengths of 1 m, 2 m and 3 m and are cut to length as required.

Annex A describes the dimensions and materials of the Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 and AM16 x L 4.8.

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 threaded rods AM10 x L 4.8, AM12 x L 4.8 and AM16 x L 4.8 are used in compliance with the specifications and under boundary conditions set out in Annex B. The test and assessment methods on which this European Technical Assessment is based lead to an assumption of a working life of the Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 and AM16 x L 4.8 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	Class A1

3.2 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Dimensions	see Annex A
Material	see Annex A
Resistance to combined bending and tension at elevated temperatures	see Annex C
Tension resistance at elevated temperatures	see Annex C
Compression resistance at elevated temperatures	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

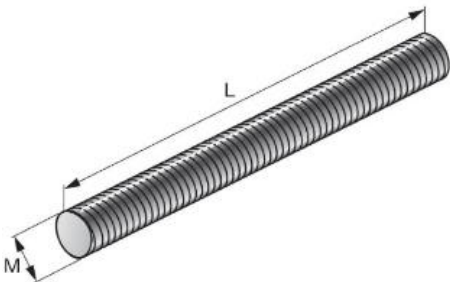
The technical details necessary for the implementation of the system for the assessment and verification of constancy of performance are laid down in the control plan (confidential part of this European Technical Assessment) deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 9 July 2018 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Häßler

Table A1: Dimensions and materials of threaded rods

Illustration	Item number	Designation	M thread	L [mm]	Material
	339795	AM10x1000 4.8	M10	1000	Strength class 4.8 in accordance with DIN 976-1, zinc coated
	339796	AM10x2000 4.8	M10	2000	
	216418	AM10x3000 4.8	M10	3000	
	339797	AM12x1000 4.8	M12	1000	
	216420	AM12x2000 4.8	M12	2000	
	216421	AM12x3000 4.8	M12	3000	
	216422	AM16x1000 4.8	M16	1000	
	216423	AM16x2000 4.8	M16	2000	
	216424	AM16x3000 4.8	M16	3000	

Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 and AM16 x L 4.8

Product description
Dimensions and materials

Annex A

- Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 und AM16 x L 4.8 are used to transfer building services component loads such as ducts and equipment for sprinklers, water, heating, cooling, ventilation, electrical and other systems. Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 und AM16 x L 4.8 are performing this loadbearing function at elevated temperatures under the conditions described in Section 2 of this European Technical Assessment.
- Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 und AM16 x L 4.8 are deployed as thread connectors in installation systems. Typical examples for the application of threaded rods in installation systems are:
 - for suspending or mounting pipe clamps in conjunction with installation channels;
 - for suspending installation channels.
- If such systems are exposed to elevated temperatures, threaded rods are exposed to combined bending and tension stress as a result of a link polygon forming between the suspension points and the channel. The combined bending and tension resistance at elevated temperatures results with a cantilever arm length of threaded rod ≤ 150 mm. Installed horizontally in a furnace, the threaded rod is rigidly connected to a vertical channel and loaded at its outer end (see Figure B1).
- The resistance at elevated temperatures applies for 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.
- The anchoring used with the base material must be suitable and have a fireproof certificate.
- 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.
- The threaded rods must be installed by appropriately qualified personnel and under the supervision of the site manager.

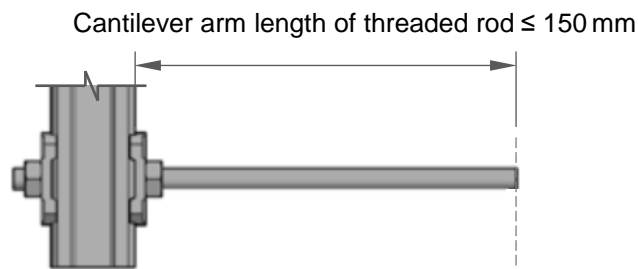


Figure B1: Installed threaded rod in conjunction with vertical channel

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Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 and AM16 x L 4.8	Annex B
Requirements for performance assessment	

Table C1.1: Resistance to combined bending and tension load at elevated temperatures:
Parameter of regression curve $F_{Rk}(t) = c_3 (c_1 + c_2 / t)$ [N]

Designation	c_1 [-]	c_2 [-]	c_3 [-]	t_{min} [minutes]	t_{max} [minutes]
M10 threaded rods ¹⁾	260.907	29615.482	0.927769	30	146
M12 threaded rods	NPA ²⁾	NPA	NPA	NPA	NPA
M16 threaded rods	NPA	NPA	NPA	NPA	NPA

Table C1.2: Resistance $F_{Rk,t}$ to combined bending and tension load at elevated temperatures after $t = 30, 60, 90$ and 120 minutes

Designation	$F_{Rk,30}$ [N]	$F_{Rk,60}$ [N]	$F_{Rk,90}$ [N]	$F_{Rk,120}$ [N]
M10 threaded rods ¹⁾	1158	700	547	471
M12 threaded rods	NPA ²⁾	NPA	NPA	NPA
M16 threaded rods	NPA	NPA	NPA	NPA

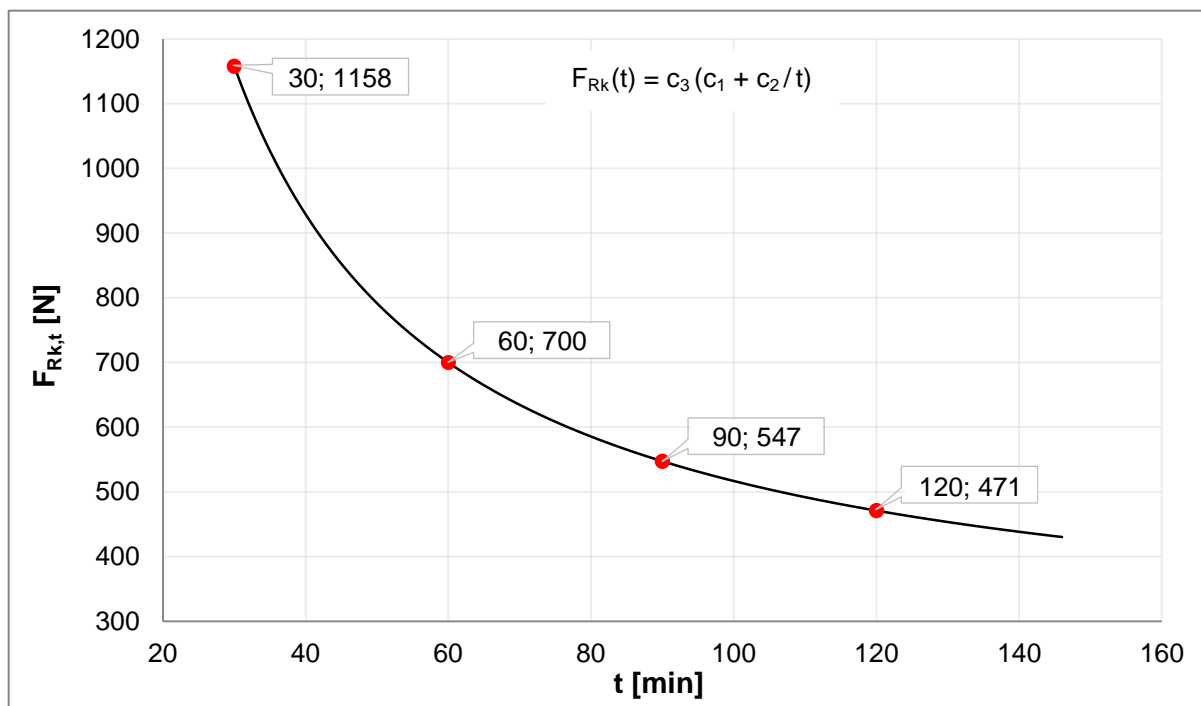


Figure C1: Resistance to combined bending and tension load for M10 threaded rods at elevated temperatures

- ¹⁾ Cantilever arm length of threaded rod ≤ 150 mm
- ²⁾ NPA: No performance assessed

Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 and AM16 x L 4.8

Resistance to combined bending and tension at elevated temperatures

Annex C1

Table C2.1: Calculation-based tension resistance $F_{Rk,t}$ at elevated temperatures after $t = 30, 60, 90$ and 120 minutes

Designation	$F_{Rk,30}$ [N]	$F_{Rk,60}$ [N]	$F_{Rk,90}$ [N]	$F_{Rk,120}$ [N]
M10 threaded rods	1650	950	720	560
M12 threaded rods	2400	1380	1050	810
M16 threaded rods	4470	2560	1950	1520

Table C2.2: Calculation-based compression resistance $F_{Rk,t}$ at elevated temperatures after $t = 30, 60, 90$ and 120 minutes for M10 threaded rods

Installed length L [mm]	$F_{Rk,30}$ [N]	$F_{Rk,60}$ [N]	$F_{Rk,90}$ [N]	$F_{Rk,120}$ [N]
40	1240	740	560	440
50	1140	680	520	400
60	1030	630	480	370
70	920	570	430	340
80	820	520	390	310
90	720	460	350	280
100	640	420	320	250
110	570	370	280	220
120	500	330	250	200
130	450	300	230	180
140	400	270	200	160
150	360	240	180	140
160	320	220	170	130
170	290	200	150	120
180	260	180	140	110
190	240	170	130	100
200	220	150	120	90
210	200	140	110	80
220	190	130	100	80
230	170	120	90	70
240	160	110	80	70
250	150	100	80	60
260	140	100	70	60
270	130	90	70	50
280	120	80	60	50
290	110	80	60	50
300	110	70	60	40
310	100	70	50	40

Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 and AM16 x L 4.8

Tension resistance at elevated temperatures
Compression resistance at elevated temperatures

Annex C2

Table C3: Calculation-based compression resistance $F_{Rk,t}$ at elevated temperatures after $t = 30, 60, 90$ and 120 minutes for M12 threaded rods

Installed length L [mm]	$F_{Rk,30}$ [N]	$F_{Rk,60}$ [N]	$F_{Rk,90}$ [N]	$F_{Rk,120}$ [N]
40	1910	1120	850	660
50	1780	1060	810	630
60	1650	990	760	590
70	1520	930	710	550
80	1390	860	650	510
90	1270	790	600	470
100	1150	730	550	430
110	1040	670	510	390
120	930	610	460	360
130	840	550	420	330
140	760	510	380	300
150	690	460	350	270
160	630	420	320	250
170	570	390	290	230
180	520	360	270	210
190	480	330	250	190
200	440	300	230	180
210	410	280	210	170
220	380	260	200	150
230	350	240	180	140
240	320	220	170	130
250	300	210	160	120
260	280	190	150	120
270	260	180	140	110
280	250	170	130	100
290	230	160	120	100
300	220	150	120	90
330	180	130	100	80
360	160	110	80	60
390	130	90	70	60
420	120	80	60	50
450	100	70	60	40

Hilti threaded rods AM12 x L 4.8

Compression resistance at elevated temperatures

Annex C3

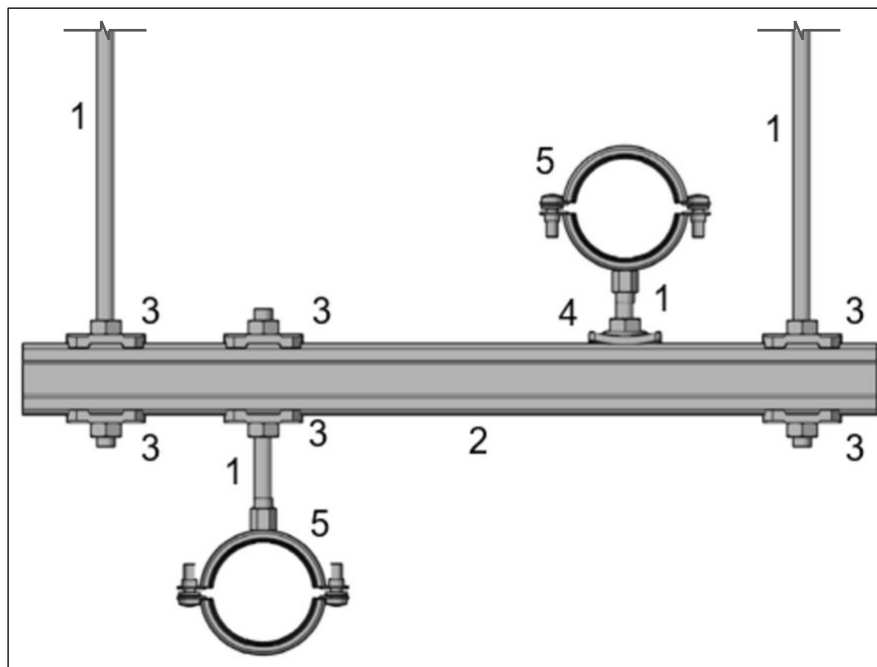
Table C4: Calculation-based compression resistance $F_{Rk,t}$ at elevated temperatures after $t = 30$,
60, 90 and 120 minutes for M16 threaded rods

Installed length L [mm]	$F_{Rk,30}$ [N]	$F_{Rk,60}$ [N]	$F_{Rk,90}$ [N]	$F_{Rk,120}$ [N]
40	3800	2210	1680	1310
50	3630	2130	1620	1260
60	3460	2040	1560	1210
70	3290	1960	1490	1160
80	3120	1870	1420	1110
90	2940	1780	1350	1050
100	2760	1690	1280	1000
110	2580	1590	1210	940
120	2410	1500	1140	890
130	2240	1410	1080	840
140	2080	1330	1010	790
150	1930	1240	940	740
160	1790	1160	880	690
170	1660	1090	830	640
180	1540	1020	770	600
190	1430	950	720	560
200	1330	890	680	530
210	1240	830	630	490
220	1160	780	590	460
230	1080	730	560	430
240	1010	690	520	410
250	950	640	490	380
260	890	610	460	360
270	840	570	430	340
280	790	540	410	320
290	740	510	390	300
300	700	480	370	290
330	600	410	310	240
360	510	350	270	210
390	440	310	230	180
420	390	270	210	160
450	340	240	180	140

Hilti threaded rods AM16 x L 4.8

Compression resistance at elevated temperatures

Annex C4



Legend

- | | | |
|---|---|------------------------------------|
| 1 | Threaded rod | |
| | The fastening of the threaded rods to the base material is made with appropriate anchors. | |
| 2 | Installation channel | (not an integral part of this ETA) |
| 3 | Drilled plates with hexagonal nuts | (not an integral part of this ETA) |
| 4 | Pipe ring saddle | (not an integral part of this ETA) |
| 5 | Pipe ring | (not an integral part of this ETA) |

Hilti threaded rods AM10 x L 4.8, AM12 x L 4.8 and AM16 x L 4.8

Threaded rods on suspended rails

Annex D
(informative)