



European Technical Assessment

**ETA-20/0952
of 30/11/2022**

English translation prepared by CSTB - Original version in French language

General Part

Trade name:	Hilti ultimate pipe clamps MP-U-I, MP-U, and MP-U-G
Product family:	Products for installation systems for supporting technical building equipment
Manufacturer:	Hilti AG Liechtenstein Feldkircherstraße 100 9494 Schaan Principality of Liechtenstein
Manufacturing plants:	L 9295
This European Technical Assessment contains:	70 pages including 67 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 August 2017
This version replaces:	ETA-20/0952 from 09/06/2021

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 This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission in accordance with Article 25(3) of Regulation (EU) No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

Objects of this European Technical Assessment are Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G. The pipe clamps consist of two profiled steel strips, which are designed to be able to surround a pipe circularly. The clamping strips are connected together on one side by a steel screw and on the other side by a snap-in lock system. The clamping stripes are pressed onto the outside of the pipe to be fastened by tightening the screw. Each pipe clamp has a designated clamping range. The top clamping strip features welded connection heads with M8, M8/M10, M8/10/O16 or M8/10/½" combi-threads.

The clamping strips of MP-U-I are fitted with a TPE profile on the inside to aid structure-borne sound insulation, to balance unevenness and to prevent contact corrosion.

The clamping strips of MP-U-G are fitted with an EPDM profile on the inside to reduce friction and allow sliding of the pipe caused by thermal expansion and to balance unevenness.

Annex A describes the dimensions and materials of the Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G. The requirements for performance assessment are given in Annex B.

2 Specification of the intended use

The performance given in Section 3 can only be assumed if the Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G are used in compliance with the specifications and under boundary conditions set out in Annexes A to D. The test and assessment methods on which this European Technical Assessment is based lead to an assumption of a working life of the pipe clamps 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 supporting technical building equipment-

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
Resistance and deformations of Hilti ultimate pipe clamps MP-U-I M8/10, MP-U-I M8/10/O16, MP-U-I M8/10/½", MP-U M8/10 and MP-U M8/10/½" in case of fire	see Annex D

3.2 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Dimensions and materials of Hilti ultimate pipe clamps MP-U-I M8/10, MP-U-I M8/10/O16, MP-U-I M8/10/½", MP-U M8/10 and MP-U M8/10/½"	see Annex A
Characteristics of Hilti ultimate pipe clamps MP-U-I M8, MP-U-I M8/10, MP-U-I M8/10/O16, MP-U-I M8/10/½", MP-U M8/10, MP-U M8/10/½", MP-U-G M8, MP-U-G M8/10 and MP-U-G M8/10/½" 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° 96/577/EC as amended by Commission Decision 2002/592/EC:
System 1 applies for the assessment and verification of constancy of performance (AVCP).
- In case of intended use a) specified in Section 2:
Decision of the commission N° 97/161/EC:
System 2+ applies for the assessment and verification of constancy of performance (AVCP).

Decision of the commission N° 1999/472/EC as amended by Commission Decision 2001/596/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

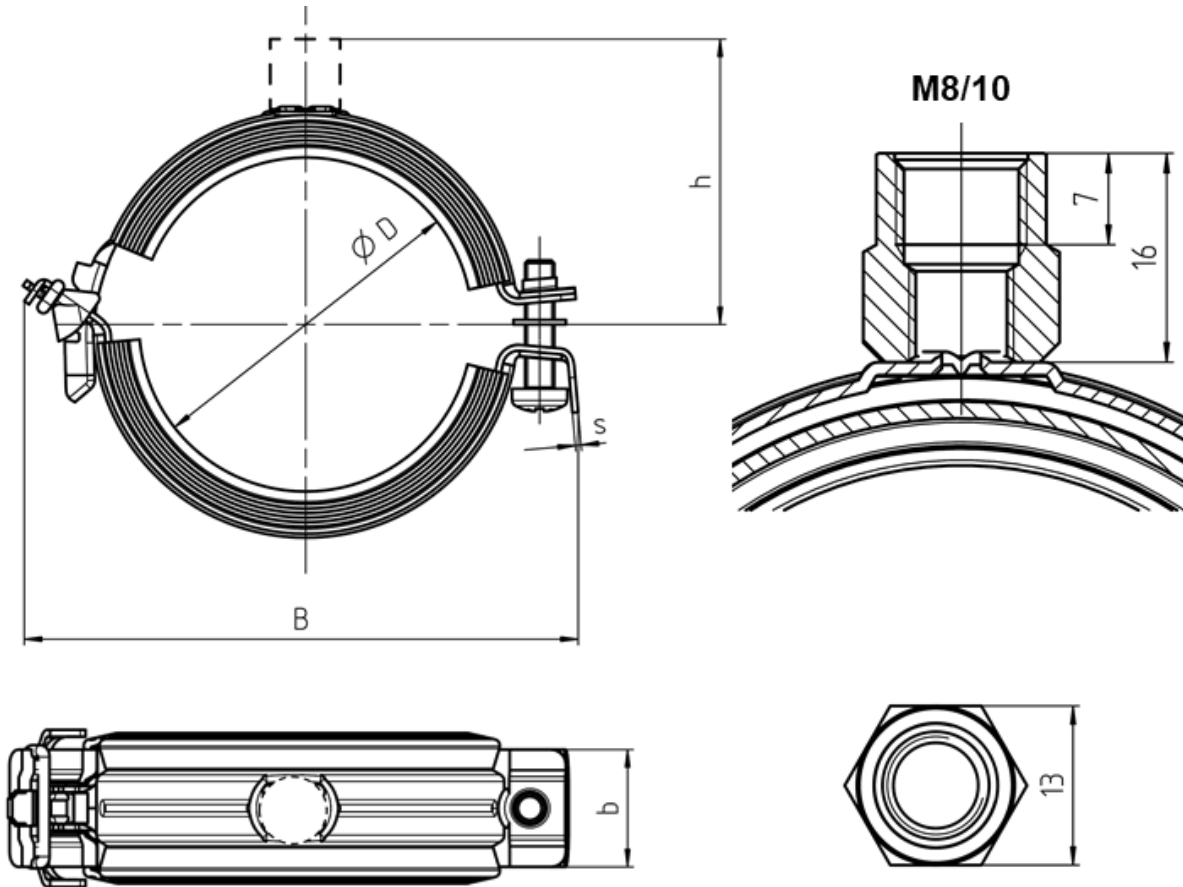
The technical details necessary for the implementation of the system for the assessment and verification of constancy of performance are laid down in the control plan (confidential part of this European Technical Assessment) deposited at Centre Scientifique et Technique du Bâtiment.

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

The original French version is signed by

Anca Cronopol
Head of the division

Figure A1: Geometry and dimensions of the pipe clamp MP-U-I M8/10



Dimensions in mm

Table A1: Materials of pipe clamps MP-U-I M8/10

Components of pipe ring	Materials
Clamping strip	DC01 in accordance with EN 10130 for the 1,0 mm strip DD11 MOD 360 in accordance with EN 10111 for the 1,5 mm, 1,8 mm and 2,0 mm strip
Connection head	Property class ≥ 5 in accordance with ISO 898-2
Clamping screw M5, M6, M8	Strength class $\geq 4,8$ in accordance with EN ISO 7045
Plate	DC01 in accordance with EN 10130 for the 1,2 mm plate DD11 MOD 360 in accordance with EN 10111 for the 1,8 mm, 2,0 mm plate
Washer	HDPE
O-Ring	EPDM / NBR
Rubber inlays	TPE

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions and materials

Annex A1

Table A2: Dimensions and tightening torque of pipe clamps MP-U-I M8/10

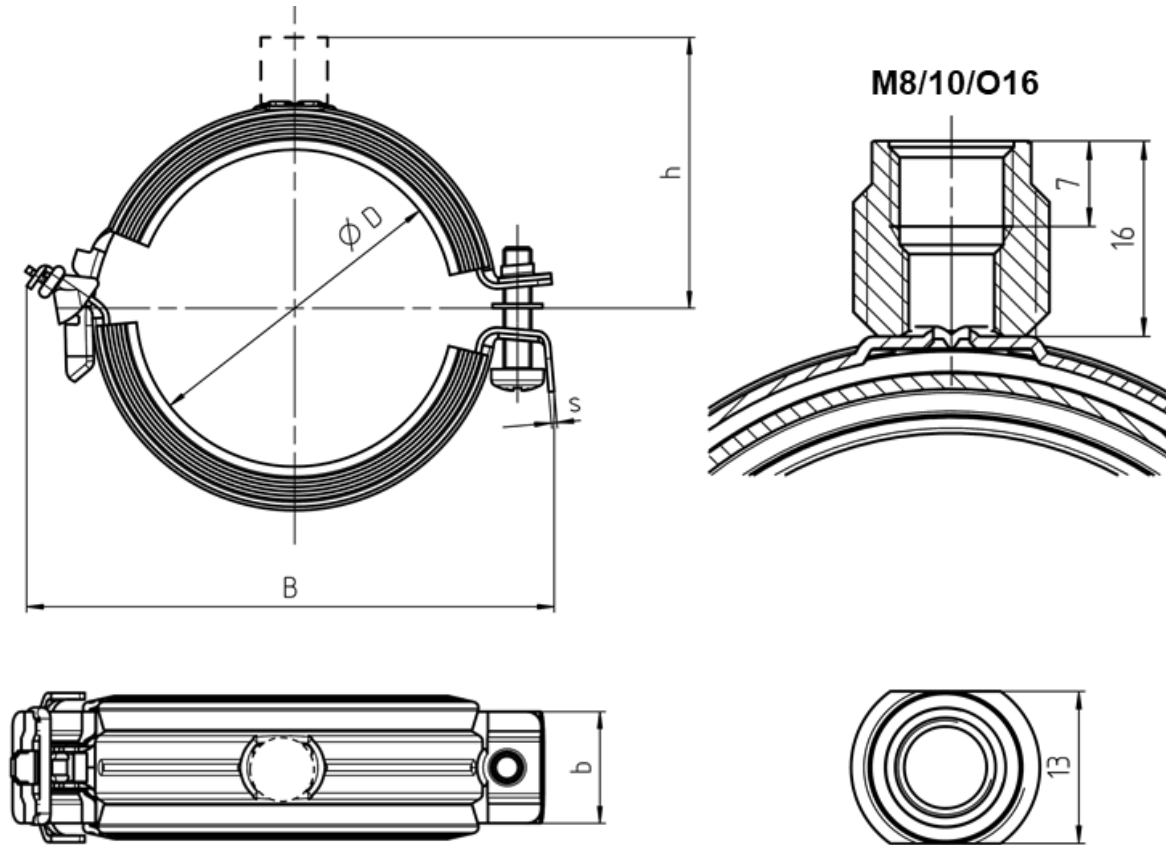
Item number	Designation	D [mm]	B [mm]	b x s [mm]	h [mm]	No. teeth	Tightening torque [Nm]	Screw size
2242258	MP-U-I 9-13 1/8" M8/10	13	46	20x1,0	28	2	1	M5x18
2242259	MP-U-I 13-17 1/4" M8/10	17	49	20x1,0	29	2	1	M5x18
2242260	MP-U-I 17-21 3/8" M8/10	21	53	20x1,0	31	2	1	M5x18
2242261	MP-U-I 21-25 1/2" M8/10	25	56	20x1,0	34	3	1	M5x22
2242262	MP-U-I 25-29 3/4" M8/10	29	62	20x1,0	36	3	1	M5x22
2242263	MP-U-I 29-33 M8/10	33	66	20x1,0	38	3	1	M5x22
2242264	MP-U-I 33-37 1" M8/10	37	70	20x1,0	40	3	1	M5x22
2242265	MP-U-I 37-42 M8/10	42	75	20x1,0	43	3	1	M5x22
2242266	MP-U-I 42-47 1 1/4" M8/10	47	80	20x1,0	45	3	1	M5x22
2242267	MP-U-I 47-52 1 1/2" M8/10	52	85	20x1,0	48	3	1	M5x22
2242268	MP-U-I 52-57 M8/10	57	90	20x1,0	50	3	1	M5x22
2242269	MP-U-I 57-62 2" M8/10	62	95	20x1,0	53	3	1	M5x22
2242270	MP-U-I 62-67 M8/10	67	110	24x1,5	56	3	2	M6x30
2242271	MP-U-I 67-72 M8/10	72	115	24x1,5	58	3	2	M6x30
2242272	MP-U-I 72-77 2 1/2" M8/10	77	120	24x1,5	61	3	2	M6x30
2242273	MP-U-I 78-84 M8/10	84	127	24x1,5	64	3	2	M6x30
2242274	MP-U-I 84-90 3" M8/10	90	133	24x1,5	67	3	2	M6x30
2242275	MP-U-I 90-96 M8/10	96	139	24x1,5	70	3	2	M6x30
2242276	MP-U-I 97-103 M8/10	103	152	24x1,8	74	3	3	M8x35
2242277	MP-U-I 103-109 M8/10	109	160	24x1,8	78	3	3	M8x35
2242278	MP-U-I 109-115 4" M8/10	115	166	24x1,8	81	3	3	M8x35
2242279	MP-U-I 115-121 M8/10	121	172	24x1,8	84	3	3	M8x35
2242280	MP-U-I 122-128 M8/10	128	179	24x1,8	87	3	3	M8x35
2242281	MP-U-I 129-135 M8/10	135	186	24x1,8	91	3	3	M8x35
2305365	MP-U-I 135-141 5" M8/10	141	192	24x1,8	94	3	3	M8x35
2305366	MP-U-I 141-147 M8/10	147	201	24x2,0	97	3	3	M8x35
2305367	MP-U-I 147-153 M8/10	153	207	24x2,0	100	3	3	M8x35
2305368	MP-U-I 154-160 M8/10	160	214	24x2,0	103	3	3	M8x35
2305369	MP-U-I 160-166 6" M8/10	166	220	24x2,0	106	3	3	M8x35
2305370	MP-U-I 164-170 M8/10	170	224	24x2,0	108	3	3	M8x35

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A2

Figure A2: Geometry and dimensions of Hilti ultimate pipe clamps MP-U-I M8/10/O16



Dimensions in mm

Table A3: Materials of pipe clamps MP-U-I M8/10/O16

Components of pipe ring	Materials
Clamping strip	DC01 in accordance with EN 10130 for the 1.0 mm strip DD11 MOD 360 in accordance with EN 10111 for the 1.5 mm, 1.8 mm and 2.0 mm strip
Connection head	Property class ≥ 5 in accordance with ISO 898-2
Clamping screw M5, M6, M8	Strength class ≥ 4.8 in accordance with EN ISO 7045
Plate	DC01 in accordance with EN 10130 for the 1,2 mm plate DD11 MOD 360 in accordance with EN 10111 for the 1,8 mm, 2,0 mm plate
Washer	HDPE
O-Ring	EPDM / NBR
Rubber inlays	TPE

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions and materials

Annex A3

Table A4: Dimensions and tightening torque of pipe clamps MP-U-I M8/10/O16

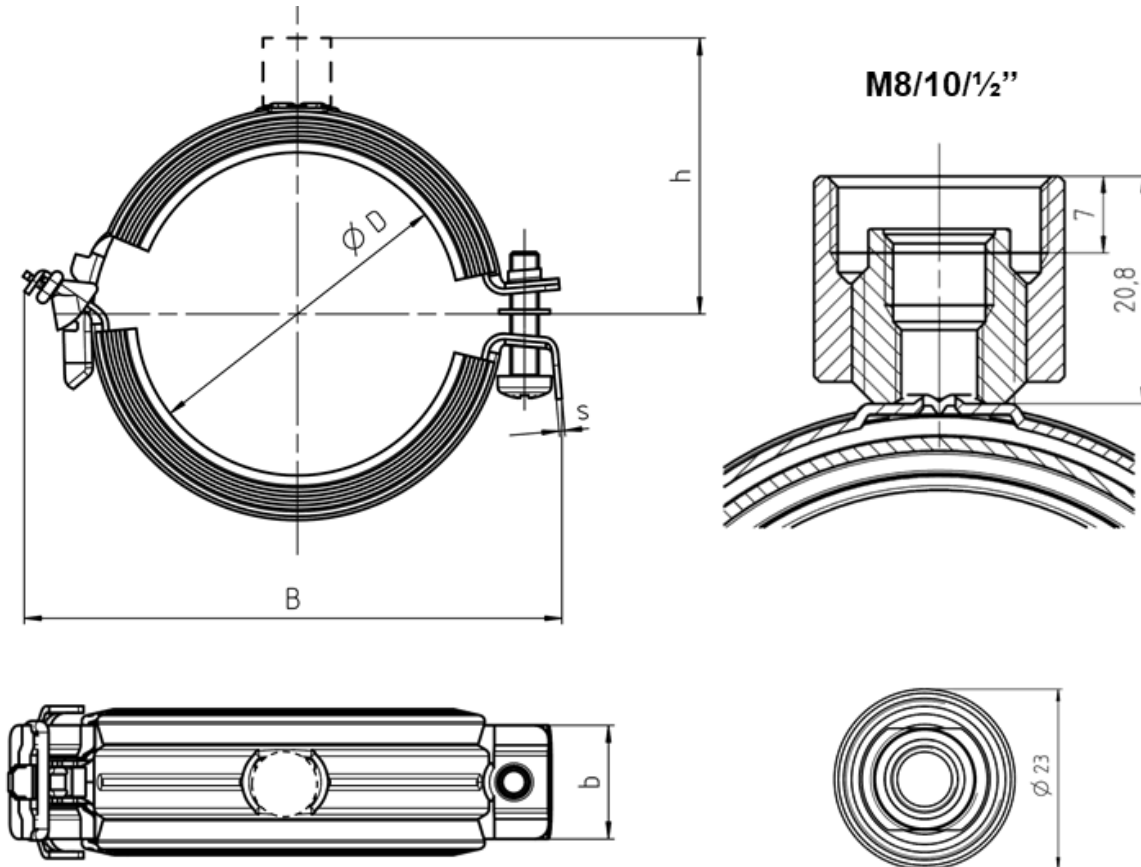
Item number	Designation	D [mm]	B [mm]	b x s [mm]	h [mm]	No. teeth	Tightening torque [Nm]	Screw size
2242308	MP-U-I 9-13 1/8" M8/10/O16	13	46	20x1,0	28	2	1	M5x18
2242309	MP-U-I 13-17 1/4" M8/10/O16	17	49	20x1,0	29	2	1	M5x18
2242310	MP-U-I 17-21 3/8" M8/10/O16	21	53	20x1,0	31	2	1	M5x18
2242311	MP-U-I 21-25 1/2" M8/10/O16	25	56	20x1,0	34	3	1	M5x22
2242312	MP-U-I 25-29 3/4" M8/10/O16	29	62	20x1,0	36	3	1	M5x22
2242313	MP-U-I 29-33 M8/10/O16	33	66	20x1,0	38	3	1	M5x22
2242314	MP-U-I 33-37 1" M8/10/O16	37	70	20x1,0	40	3	1	M5x22
2242315	MP-U-I 37-42 M8/10/O16	42	75	20x1,0	43	3	1	M5x22
2242316	MP-U-I 42-47 1 1/4" M8/10/O16	47	80	20x1,0	45	3	1	M5x22
2242317	MP-U-I 47-52 1 1/2" M8/10/O16	52	85	20x1,0	48	3	1	M5x22
2242318	MP-U-I 52-57 M8/10/O16	57	90	20x1,0	50	3	1	M5x22
2242319	MP-U-I 57-62 2" M8/10/O16	62	95	20x1,0	53	3	1	M5x22
2242320	MP-U-I 62-67 M8/10/O16	67	110	24x1,5	56	3	2	M6x30
2242321	MP-U-I 67-72 M8/10/O16	72	115	24x1,5	58	3	2	M6x30
2242322	MP-U-I 72-77 2 1/2" M8/10/O16	77	120	24x1,5	61	3	2	M6x30
2242323	MP-U-I 78-84 M8/10/O16	84	127	24x1,5	64	3	2	M6x30
2242324	MP-U-I 84-90 3" M8/10/O16	90	133	24x1,5	67	3	2	M6x30
2242325	MP-U-I 90-96 M8/10/O16	96	139	24x1,5	70	3	2	M6x30
2242326	MP-U-I 97-103 M8/10/O16	103	152	24x1,8	74	3	3	M8x35
2242327	MP-U-I 103-109 M8/10/O16	109	160	24x1,8	78	3	3	M8x35
2242328	MP-U-I 109-115 4" M8/10/O16	115	1656	24x1,8	81	3	3	M8x35
2242329	MP-U-I 115-121 M8/10/O16	121	172	24x1,8	84	3	3	M8x35
2242330	MP-U-I 122-128 M8/10/O16	128	179	24x1,8	87	3	3	M8x35
2242331	MP-U-I 129-135 M8/10/O16	135	186	24x1,8	91	3	3	M8x35
2305377	MP-U-I 135-141 5" M8/10/O16	141	192	24x1,8	94	3	3	M8x35
2305378	MP-U-I 141-147 M8/10/O16	147	201	24x2,0	97	3	3	M8x35
2305379	MP-U-I 147-153 M8/10/O16	153	207	24x2,0	100	3	3	M8x35
2305380	MP-U-I 154-160 M8/10/O16	160	214	24x2,0	103	3	3	M8x35
2305381	MP-U-I 160-166 6" M8/10/O16	166	220	24x2,0	106	3	3	M8x35
2305382	MP-U-I 164-170 M8/10/O16	170	224	24x2,0	108	3	3	M8x35

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A4

Figure A3: Geometry and dimensions of Hilti ultimate pipe clamps MP-U-I M8/10½"



Dimensions in mm

Table A5: Materials of pipe clamps MP-U-I M8/10½"

Components of pipe ring	Materials
Clamping strip	DC01 in accordance with EN 10130 for the 1,0 mm strip DD11 MOD 360 in accordance with EN 10111 for the 1,5 mm, 1,8 mm and 2,0 mm strip
Connection head	Property class ≥ 5 in accordance with ISO 898-2
Clamping screw M5, M6, M8	Strength class ≥ 4.8 in accordance with EN ISO 7045
Plate	DC01 in accordance with EN 10130 for the 1,2 mm plate DD11 MOD 360 in accordance with EN 10111 for the 1,8 mm, 2,0 mm plate
Washer	HDPE
O-Ring	EPDM / NBR
Rubber inlays	TPE

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions and materials

Annex A5

Table A6: Dimensions and tightening torque of pipe clamps MP-U-I M8/10 $\frac{1}{2}$ "

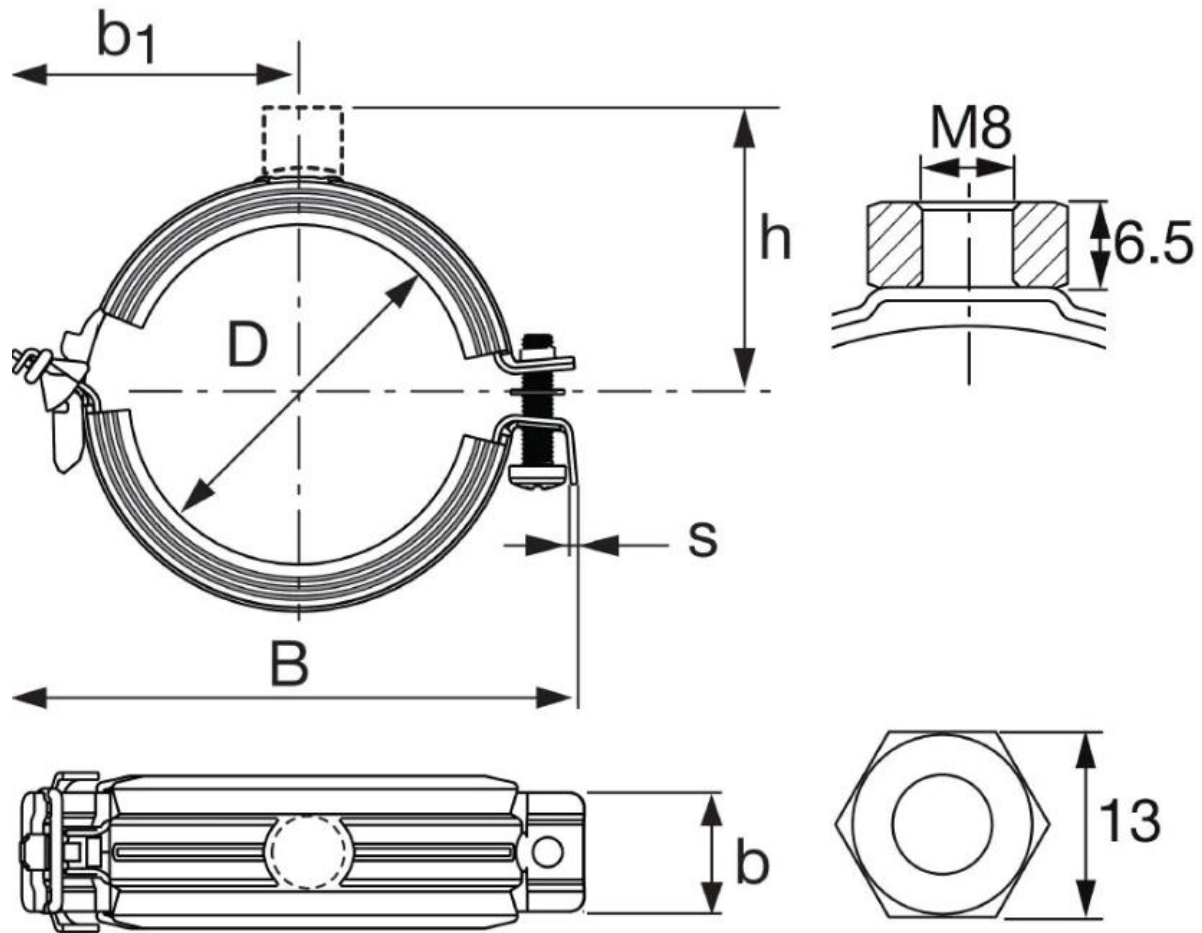
Item number	Designation	D [mm]	B [mm]	b x s [mm]	h [mm]	No. teeth	Tightening torque [Nm]	Screw size
2242283	MP-U-I 9-13 1/8" M8/10 $\frac{1}{2}$ "	13	46	20x1,0	32	2	1	M5x18
2242284	MP-U-I 13-17 1/4" M8/10 $\frac{1}{2}$ "	17	49	20x1,0	34	2	1	M5x18
2242285	MP-U-I 17-21 3/8" M8/10 $\frac{1}{2}$ "	21	53	20x1,0	36	2	1	M5x18
2242286	MP-U-I 21-25 1/2" M8/10 $\frac{1}{2}$ "	25	56	20x1,0	38	3	1	M5x22
2242287	MP-U-I 25-29 3/4" M8/10 $\frac{1}{2}$ "	29	62	20x1,0	41	3	1	M5x22
2242288	MP-U-I 29-33 M8/10 $\frac{1}{2}$ "	33	66	20x1,0	43	3	1	M5x22
2242289	MP-U-I 33-37 1" M8/10 $\frac{1}{2}$ "	37	70	20x1,0	45	3	1	M5x22
2242290	MP-U-I 37-42 M8/10 $\frac{1}{2}$ "	42	75	20x1,0	47	3	1	M5x22
2242291	MP-U-I 42-47 1 1/4" M8/10 $\frac{1}{2}$ "	47	80	20x1,0	50	3	1	M5x22
2242292	MP-U-I 47-52 1 1/2" M8/10 $\frac{1}{2}$ "	52	85	20x1,0	52	3	1	M5x22
2242293	MP-U-I 52-57 M8/10 $\frac{1}{2}$ "	57	90	20x1,0	55	3	1	M5x22
2242294	MP-U-I 57-62 2" M8/10 $\frac{1}{2}$ "	62	95	20x1,0	57	3	1	M5x22
2242295	MP-U-I 62-67 M8/10 $\frac{1}{2}$ "	67	110	24x1,5	61	3	2	M6x30
2242296	MP-U-I 67-72 M8/10 $\frac{1}{2}$ "	72	115	24x1,5	63	3	2	M6x30
2242297	MP-U-I 72-77 2 1/2" M8/10 $\frac{1}{2}$ "	77	120	24x1,5	66	3	2	M6x30
2242298	MP-U-I 78-84 M8/10 $\frac{1}{2}$ "	84	127	24x1,5	69	3	2	M6x30
2242299	MP-U-I 84-90 3" M8/10 $\frac{1}{2}$ "	90	133	24x1,5	72	3	2	M6x30
2242300	MP-U-I 90-96 M8/10 $\frac{1}{2}$ "	96	139	24x1,5	75	3	2	M6x30
2242301	MP-U-I 97-103 M8/10 $\frac{1}{2}$ "	103	152	24x1,8	79	3	3	M8x35
2242302	MP-U-I 103-109 M8/10 $\frac{1}{2}$ "	109	160	24x1,8	82	3	3	M8x35
2242303	MP-U-I 109-115 4" M8/10 $\frac{1}{2}$ "	115	166	24x1,8	85	3	3	M8x35
2242304	MP-U-I 115-121 M8/10 $\frac{1}{2}$ "	121	172	24x1,8	88	3	3	M8x35
2242305	MP-U-I 122-128 M8/10 $\frac{1}{2}$ "	128	179	24x1,8	92	3	3	M8x35
2242306	MP-U-I 129-135 M8/10 $\frac{1}{2}$ "	135	186	24x1,8	95	3	3	M8x35
2305371	MP-U-I 135-141 5" M8/10 $\frac{1}{2}$ "	141	192	24x1,8	98	3	3	M8x35
2305372	MP-U-I 141-147 M8/10 $\frac{1}{2}$ "	147	201	24x2,0	101	3	3	M8x35
2305373	MP-U-I 147-153 M8/10 $\frac{1}{2}$ "	153	207	24x2,0	104	3	3	M8x35
2305374	MP-U-I 154-160 M8/10 $\frac{1}{2}$ "	160	214	24x2,0	108	3	3	M8x35
2305375	MP-U-I 160-166 6" M8/10 $\frac{1}{2}$ "	166	220	24x2,0	111	3	3	M8x35
2305376	MP-U-I 164-170 M8/10 $\frac{1}{2}$ "	170	224	24x2,0	113	3	3	M8x35

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A6

Figure A4: Geometry and dimensions of Hilti ultimate pipe clamps MP-U-I M8



Dimensions in mm

Table A7: Materials of pipe clamps MP-U-I M8

Components of pipe ring	Materials
Clamping strip	DC01 in accordance with EN 10130 for the 1,0 mm strip DD11 MOD 360 in accordance with EN 10111 for the 1,5 mm, 1,8 mm and 2,0 mm strip
Connection head	Property class ≥ 5 in accordance with ISO 898-2
Clamping screw M5, M6, M8	Strength class ≥ 4.8 in accordance with EN ISO 7045
Plate	DC01 in accordance with EN 10130 for the 1,2 mm plate DD11 MOD 360 in accordance with EN 10111 for the 1,8 mm, 2,0 mm plate
Washer	HDPE
O-Ring	EPDM / NBR
Rubber inlays	TPE

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions and materials

Annex A7

Table A8: Dimensions and tightening torque of pipe clamps MP-U-I M8

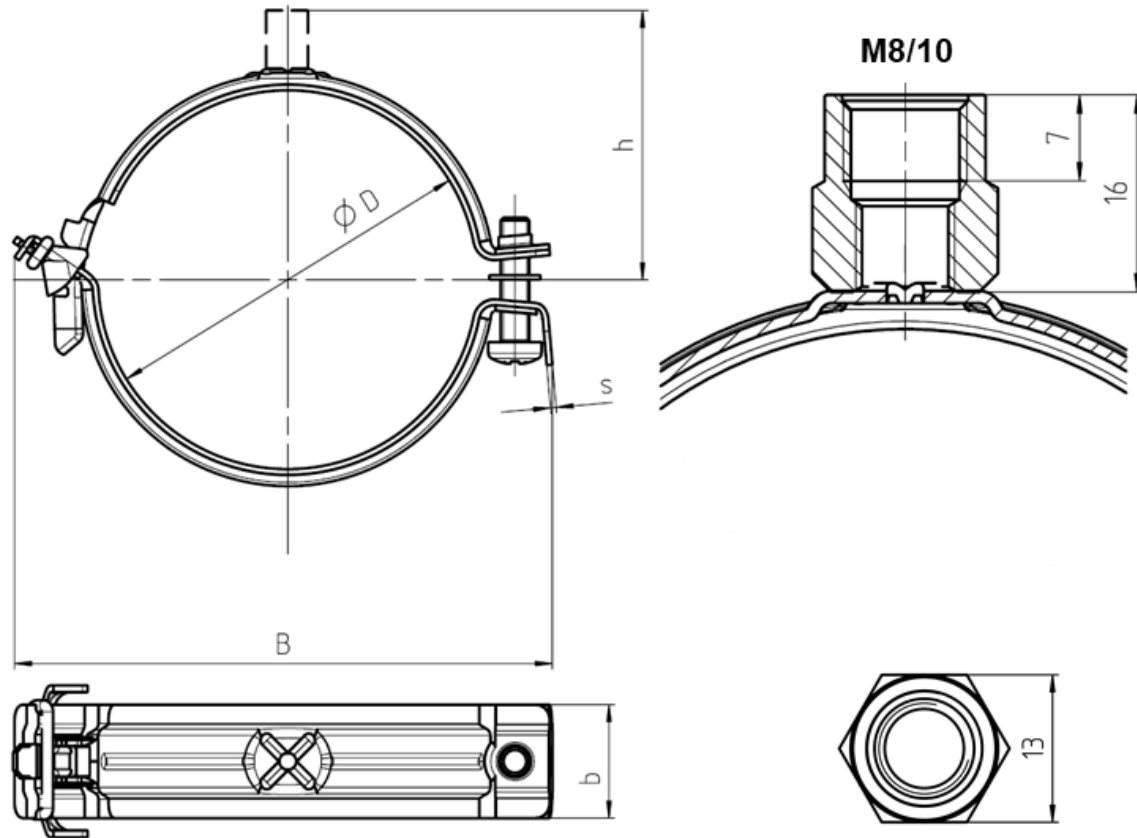
Item number	Designation	D [mm]	B [mm]	b x s [mm]	h [mm]	No. teeth	Tightening torque [Nm]	Screw size
2242237	MP-U-I 9-13 1/8" M8	13	46	20x1,0	18	2	1	M5x18
2242238	MP-U-I 13-17 1/4" M8	17	49	20x1,0	20	2	1	M5x18
2242239	MP-U-I 17-21 3/8" M8	21	53	20x1,0	22	2	1	M5x18
2242250	MP-U-I 21-25 1/2" M8	25	56	20x1,0	24	3	1	M5x22
2242251	MP-U-I 25-29 3/4" M8	29	62	20x1,0	27	3	1	M5x22
2242252	MP-U-I 29-33 M8	33	66	20x1,0	29	3	1	M5x22
2242253	MP-U-I 33-37 1" M8	37	70	20x1,0	31	3	1	M5x22
2242254	MP-U-I 37-42 M8	42	75	20x1,0	33	3	1	M5x22
2242255	MP-U-I 42-47 1 1/4" M8	47	80	20x1,0	36	3	1	M5x22
2242256	MP-U-I 47-52 1 1/2" M8	52	85	20x1,0	38	3	1	M5x22
2242263	MP-U-I 52-57 M8	57	90	20x1,0	41	3	1	M5x22
2242264	MP-U-I 57-62 2" M8	62	95	20x1,0	43	3	1	M5x22

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A8

Figure A5: Geometry and dimensions of Hilti ultimate pipe clamps MP-U M8/10



Dimensions in mm

Table A9: Materials of pipe clamps MP-U M8/10

Components of pipe ring	Materials
Clamping strip	DC01 in accordance with EN 10130 for the 1,0 mm strip DD11 MOD 360 in accordance with EN 10111 for the 1,5 mm, 1,8 mm and 2,0 mm strip
Connection head	Property class ≥ 5 in accordance with ISO 898-2
Clamping screw M5, M6, M8	Strength class ≥ 4.8 in accordance with EN ISO 7045
Plate	DC01 in accordance with EN 10130 for the 1,2 mm plate DD11 MOD 360 in accordance with EN 10111 for the 1.8 mm, 2.0 mm plate
Washer	HDPE
O-Ring	EPDM / NBR

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions and materials

Annex A9

Table A10: Dimensions and tightening torque of pipe clamps MP-U M8/10

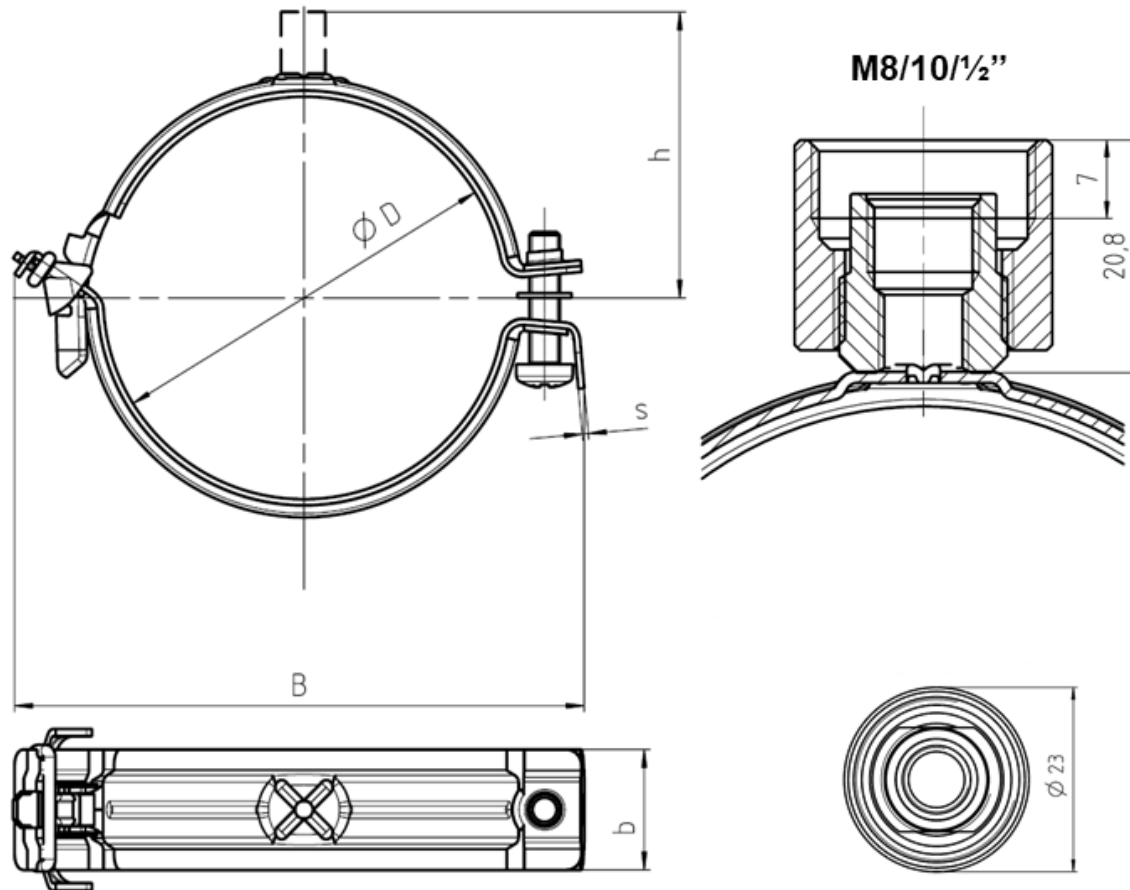
Item number	Designation	D [mm]	B [mm]	b x s [mm]	h [mm]	No. teeth	Tightening torque [Nm]	Screw size
2242334	MP-U 13-17 ¼" M8/10	17	46	20x1,0	28	2	1	M5x18
2242335	MP-U 16-20 3/8" M8/10	20	49	20x1,0	29	2	1	M5x18
2242336	MP-U 20-24 ½" M8/10	24	53	20x1,0	31	2	1	M5x18
2242337	MP-U 25-29 ¾" M8/10	29	56	20x1,0	34	3	1	M5x22
2242338	MP-U 30-34 1" M8/10	34	62	20x1,0	36	3	1	M5x22
2242339	MP-U 34-38 M8/10	38	66	20x1,0	38	3	1	M5x22
2242340	MP-U 38-42 M8/10	42	70	20x1,0	40	3	1	M5x22
2242341	MP-U 42-47 1 ¼" M8/10	47	75	20x1,0	43	3	1	M5x22
2242342	MP-U 47-52 1 ½" M8/10	52	80	20x1,0	45	3	1	M5x22
2242343	MP-U 52-57 M8/10	57	85	20x1,0	48	3	1	M5x22
2242344	MP-U 57-62 2" M8/10	62	90	20x1,0	50	3	1	M5x22
2242345	MP-U 62-67 M8/10	67	95	20x1,0	53	3	1	M5x22
2242346	MP-U 67-72 M8/10	72	110	24x1,5	56	3	2	M6x30
2242347	MP-U 72-77 2 ½" M8/10	77	115	24x1,5	58	3	2	M6x30
2242348	MP-U 77-82 M8/10	82	120	24x1,5	61	3	2	M6x30
2242349	MP-U 83-89 3" M8/10	89	127	24x1,5	64	3	2	M6x30
2242350	MP-U 89-95 M8/10	95	133	24x1,5	67	3	2	M6x30
2242351	MP-U 95-101 M8/10	101	139	24x1,5	70	3	2	M6x30
2242352	MP-U 102-108 M8/10	108	152	24x1,8	74	3	3	M8x35
2242353	MP-U 109-115 4" M8/10	115	160	24x1,8	78	3	3	M8x35
2242354	MP-U 115-121 M8/10	121	166	24x1,8	81	3	3	M8x35
2242355	MP-U 121-127 M8/10	127	172	24x1,8	84	3	3	M8x35
2242356	MP-U 128-134 M8/10	134	179	24x1,8	87	3	3	M8x35
2242357	MP-U 135-141 5" M8/10	141	186	24x1,8	91	3	3	M8x35
2305351	MP-U 141-147 M8/10	147	192	24x1,8	94	3	3	M8x35
2305352	MP-U 147-153 M8/10	153	201	24x2,0	97	3	3	M8x35
2305353	MP-U 153-159 M8/10	159	207	24x2,0	100	3	3	M8x35
2305354	MP-U 160-166 6" M8/10	166	214	24x2,0	103	3	3	M8x35
2305355	MP-U 166-172 M8/10	172	220	24x2,0	106	3	3	M8x35
2305356	MP-U 170-176 M8/10	176	224	24x2,0	108	3	3	M8x35

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A10

Figure A6: Geometry and dimensions of Hilti pipe clamps MP-U M8/10/1/2"



Dimensions in mm

Table A11: Materials of pipe clamps MP-U M8/10/1/2"

Components of pipe ring	Materials
Clamping strip	DC01 in accordance with EN 10130 for the 1,0 mm strip DD11 MOD 360 in accordance with EN 10111 for the 1,5 mm, 1,8 mm and 2,0 mm strip
Connection head	Property class ≥ 5 in accordance with ISO 898-2
Clamping screw M5, M6, M8	Strength class ≥ 4.8 in accordance with EN ISO 7045
Plate	DC01 in accordance with EN 10130 for the 1,2 mm plate DD11 MOD 360 in accordance with EN 10111 for the 1.8 mm, 2.0 mm plate
Washer	HDPE
O-Ring	EPDM / NBR

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A11

Table A12: Dimensions and tightening torque of Hilti ultimate pipe clamps MP-U M8/10/½"

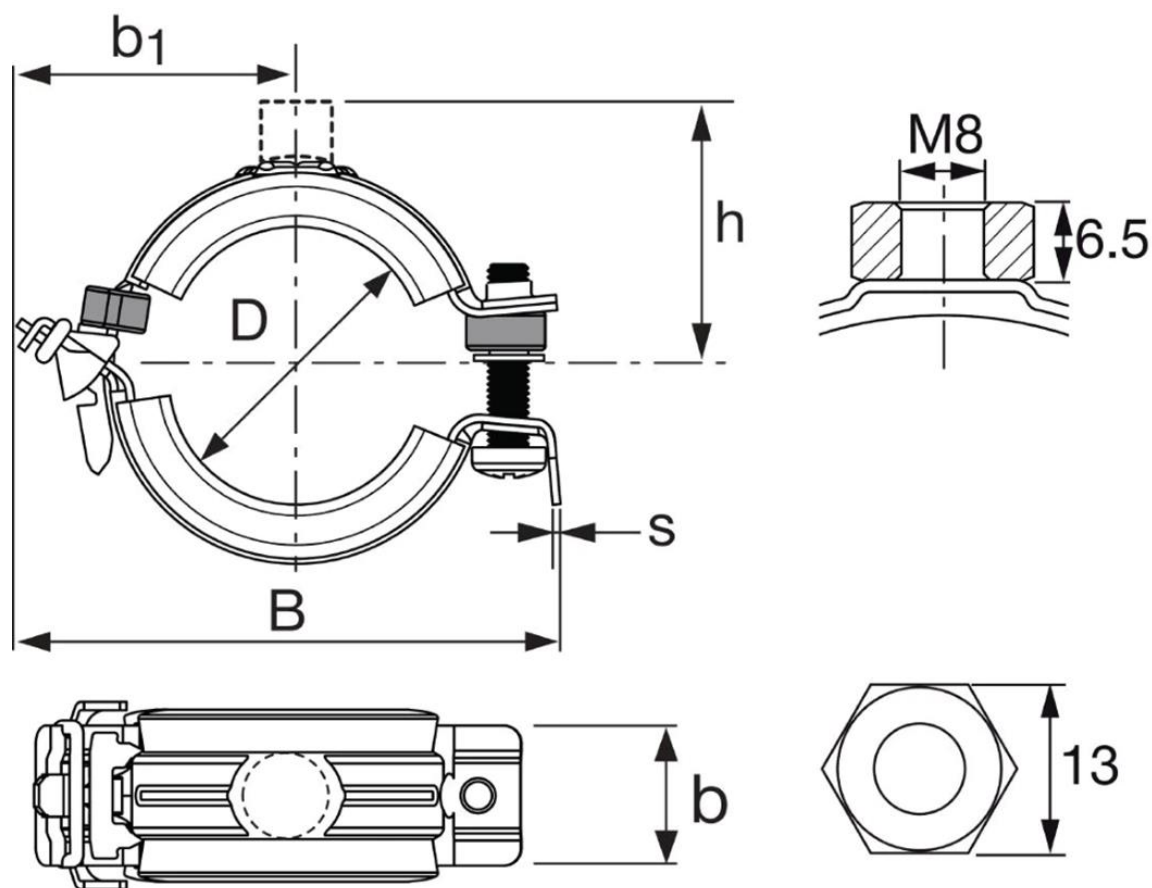
Item number	Designation	D [mm]	B [mm]	b x s [mm]	h [mm]	No. teeth	Tightening torque [Nm]	Screw size
2242359	MP-U 13-17 ¼" M8/10/½"	17	46	20x1,0	32	2	1	M5x18
2242360	MP-U 16-20 3/8" M8/10/½"	20	49	20x1,0	34	2	1	M5x18
2242361	MP-U 20-24 ½" M8/10/½"	24	53	20x1,0	36	2	1	M5x18
2242362	MP-U 25-29 ¾" M8/10/½"	29	56	20x1,0	38	3	1	M5x22
2242363	MP-U 30-34 1" M8/10/½"	34	62	20x1,0	41	3	1	M5x22
2242364	MP-U 34-38 M8/10/½"	38	66	20x1,0	43	3	1	M5x22
2242365	MP-U 38-42 M8/10/½"	42	70	20x1,0	45	3	1	M5x22
2242366	MP-U 42-47 1 ¼" M8/10/½"	47	75	20x1,0	47	3	1	M5x22
2242367	MP-U 47-52 1 ½" M8/10/½"	52	80	20x1,0	50	3	1	M5x22
2242368	MP-U 52-57 M8/10/½"	57	85	20x1,0	52	3	1	M5x22
2242369	MP-U 57-62 2" M8/10/½"	62	90	20x1,0	55	3	1	M5x22
2242370	MP-U 62-67 M8/10/½"	67	95	20x1,0	57	3	1	M5x22
2242371	MP-U 67-72 M8/10/½"	72	110	24x1,5	61	3	2	M6x30
2242372	MP-U 72-77 2 ½" M8/10/½"	77	115	24x1,5	63	3	2	M6x30
2242373	MP-U 77-82 M8/10/½"	82	120	24x1,5	66	3	2	M6x30
2242374	MP-U 83-89 3" M8/10/½"	89	127	24x1,5	69	3	2	M6x30
2242375	MP-U 89-95 M8/10/½"	95	133	24x1,5	72	3	2	M6x30
2242376	MP-U 95-101 M8/10/½"	101	139	24x1,5	75	3	2	M6x30
2242377	MP-U 102-108 M8/10/½"	108	152	24x1,8	79	3	3	M8x35
2242378	MP-U 109-115 4" M8/10/½"	115	160	24x1,8	82	3	3	M8x35
2242379	MP-U 115-121 M8/10/½"	121	166	24x1,8	85	3	3	M8x35
2242380	MP-U 121-127 M8/10/½"	127	172	24x1,8	88	3	3	M8x35
2242235	MP-U 128-134 M8/10/½"	134	179	24x1,8	92	3	3	M8x35
2242332	MP-U 135-141 5" M8/10/½"	141	186	24x1,8	95	3	3	M8x35
2305357	MP-U 141-147 M8/10/½"	147	192	24x1,8	98	3	3	M8x35
2305358	MP-U 147-153 M8/10/½"	153	201	24x2,0	101	3	3	M8x35
2305359	MP-U 153-159 M8/10/½"	159	207	24x2,0	104	3	3	M8x35
2305360	MP-U 160-166 6" M8/10/½"	166	214	24x2,0	108	3	3	M8x35
2305361	MP-U 166-172 M8/10/½"	172	220	24x2,0	111	3	3	M8x35
2305362	MP-U 170-176 M8/10/½"	176	224	24x2,0	113	3	3	M8x35

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A12

Figure A7: Geometry and dimensions of Hilti pipe clamps MP-U-G M8



Dimensions in mm

Table A13: Materials of pipe clamps MP-U-G M8

Components of pipe ring	Materials
Clamping strip	DC01 in accordance with EN 10130 for the 1,0 mm strip DD11 MOD 360 in accordance with EN 10111 for the 1,5 mm, 1,8 mm and 2,0 mm strip
Connection head	Property class ≥ 5 in accordance with ISO 898-2
Clamping screw M5, M6, M8	Strength class ≥ 4.8 in accordance with EN ISO 7045
Plate	DC01 in accordance with EN 10130 for the 1,2 mm plate DD11 MOD 360 in accordance with EN 10111 for the 1,8 mm, 2,0 mm plate
Washer	HDPE
O-Ring	EPDM / NBR
Rubber inlays	EPDM
Spacer	PA6-GF30

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A13

Table A14: Dimensions and tightening torque of pipe clamps MP-U-G M8

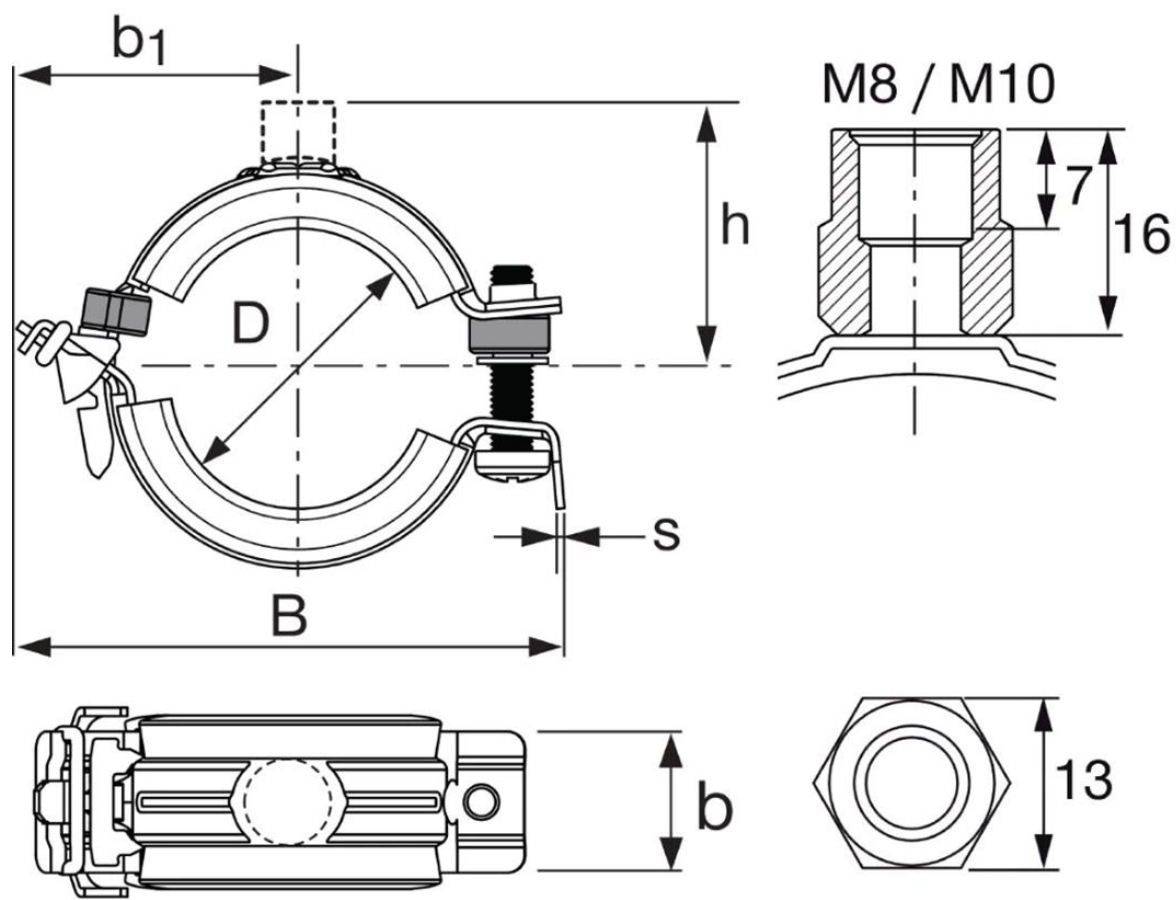
Item number	Designation	D [mm]	B [mm]	b x s [mm]	h [mm]	No. teeth	Screw size
2275020	MP-U-G 16 M8	16	53	20x1.0	22	2	M5x18
2275021	MP-U-G 20 M8	20	56	20x1.0	24	3	M5x22
2275022	MP-U-G 25 M8	25	62	20x1.0	27	3	M5x22
2275023	MP-U-G 32 M8	32	70	20x1.0	31	3	M5x22
2275024	MP-U-G 40 M8	40	75	20x1.0	33	3	M5x22
2275025	MP-U-G 50 M8	50	85	20x1.0	38	3	M5x22
2275026	MP-U-G 56 M8	56	95	20x1.0	43	3	M5x22

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A14

Figure A8: Geometry and dimensions of Hilti pipe clamps MP-U-G M8/10



Dimensions in mm

Table A15: Materials of pipe clamps MP-U-G M8/10

Components of pipe ring	Materials
Clamping strip	DC01 in accordance with EN 10130 for the 1,0 mm strip DD11 MOD 360 in accordance with EN 10111 for the 1,5 mm, 1,8 mm and 2,0 mm strip
Connection head	Property class ≥ 5 in accordance with ISO 898-2
Clamping screw M5, M6, M8	Strength class ≥ 4.8 in accordance with EN ISO 7045
Plate	DC01 in accordance with EN 10130 for the 1,2 mm plate DD11 MOD 360 in accordance with EN 10111 for the 1,8 mm, 2,0 mm plate
Washer	HDPE
O-Ring	EPDM / NBR
Rubber inlays	EPDM
Spacer	PA6-GF30

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A15

Table A16: Dimensions and tightening torque of Hilti ultimate pipe clamps MP-U-G M8/10

Item number	Designation	D [mm]	B [mm]	b x s [mm]	h [mm]	No. teeth	Screw size
2275028	MP-U-G 16 M8/10	16	53	20x1.0	31	2	M5x18
2275029	MP-U-G 20 M8/10	20	56	20x1.0	34	3	M5x22
2275030	MP-U-G 25 M8/10	25	62	20x1.0	36	3	M5x22
2275031	MP-U-G 32 M8/10	32	70	20x1.0	40	3	M5x22
2275032	MP-U-G 40 M8/10	40	75	20x1.0	43	3	M5x22
2275033	MP-U-G 50 M8/10	50	85	20x1.0	48	3	M5x22
2275034	MP-U-G 56 M8/10	56	95	20x1.0	53	3	M5x22
2275035	MP-U-G 63 M8/10	63	115	24x1.5	58	3	M6x30
2275036	MP-U-G 75 M8/10	75	127	24x1.5	64	3	M6x30
2275037	MP-U-G 90 M8/10	90	152	24x1.8	74	3	M8x35
2275038	MP-U-G 110 M8/10	110	172	24x1.8	84	3	M8x35
2275039	MP-U-G 125 M8/10	125	186	24x1.8	91	3	M8x35
2275040	MP-U-G 135 M8/10	135	201	24x2.0	97	3	M8x35
2275041	MP-U-G 160 M8/10	160	224	24x2.0	108	3	M8x35

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A16

Figure A9: Geometry and dimensions of Hilti pipe clamps MP-U-G M8/10/1½"

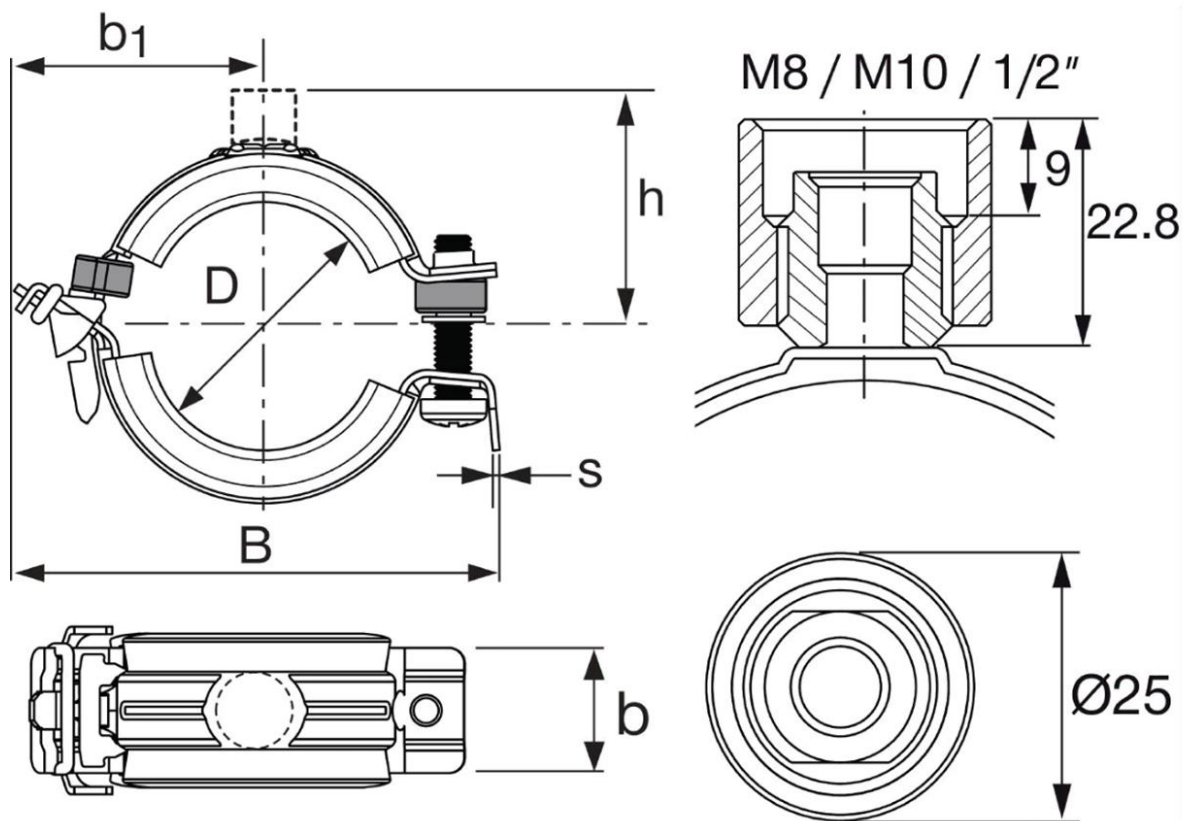


Table A17: Materials of pipe clamps MP-U-I M8/10/1½"

Components of pipe ring	Materials
Clamping strip	DC01 in accordance with EN 10130 for the 1,0 mm strip DD11 MOD 360 in accordance with EN 10111 for the 1,5 mm, 1,8 mm and 2,0 mm strip
Connection head	Property class ≥ 5 in accordance with ISO 898-2
Clamping screw M5, M6, M8	Strength class ≥ 4.8 in accordance with EN ISO 7045
Plate	DC01 in accordance with EN 10130 for the 1,2 mm plate DD11 MOD 360 in accordance with EN 10111 for the 1,8 mm, 2,0 mm plate
Washer	HDPE
O-Ring	EPDM / NBR
Rubber inlays	EPDM
Spacer	PA6-GF30

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A17

Table A18: Dimensions and tightening torque of Hilti ultimate pipe clamps MP-U-G M8/10

Item number	Designation	D [mm]	B [mm]	b x s [mm]	h [mm]	No. teeth	Screw size
2275042	MP-U-G 50 M8/10 $\frac{1}{2}$ "	50	85	20x1.0	54	3	M5x22
2275043	MP-U-G 56 M8/10 $\frac{1}{2}$ "	56	95	20x1.0	59	3	M5x22
2275044	MP-U-G 63 M8/10 $\frac{1}{2}$ "	63	115	24x1.5	65	3	M6x30
2275045	MP-U-G 75 M8/10 $\frac{1}{2}$ "	75	127	24x1.5	71	3	M6x30
2275046	MP-U-G 90 M8/10 $\frac{1}{2}$ "	90	152	24x1.8	81	3	M8x35
2275047	MP-U-G 110 M8/10 $\frac{1}{2}$ "	110	172	24x1.8	90	3	M8x35
2275048	MP-U-G 125 M8/10 $\frac{1}{2}$ "	125	186	24x1.8	97	3	M8x35
2275049	MP-U-G 135 M8/10 $\frac{1}{2}$ "	135	201	24x2.0	103	3	M8x35
2274899	MP-U-G 160 M8/10 $\frac{1}{2}$ "	160	224	24x2.0	115	3	M8x35

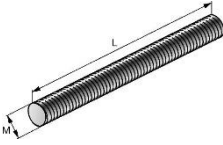
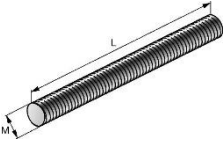
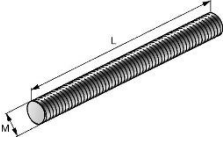
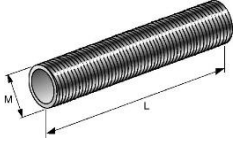
Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Product Description
Dimensions

Annex A18

- Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G are used to transfer the loads of building services components such as equipment for sprinkler, water, heating, cooling, ventilation, electrical and other installations. The pipe clamps are suitable for undertaking this load-bearing function under the conditions described in Section 2 of this European Technical Assessment.
- The resistance and deformation in case of fire are referring to the boundary conditions of the standard temperature time curve (STTC) in accordance with EN 1363-1.
- The performance data for the pipe clamp results in conjunction with the threaded rods as per Table B1.
- The pipe clamps must be installed by appropriately qualified personnel and under the supervision of the site manager. The general installation instructions of the manufacturer apply.
- The resistance and deformation at ambient temperatures and in case of fire apply for static and centric actions.
- The screw of the the pipe clamps must be tightened consistently with a torque from 1 to 3 Nm in accordance with the instructions for use.
- Prior to installation, it must be ensured that the pipe to be inserted, the anchoring of the threaded rods to the base material and the base material itself are suitable to withstand the resistance values of the pipe clamps and that they have a fireproof certificate.

Table B1: Threaded rods for use with Hilti Ultimate Pipe clamps MP-U, MP-U-I and MP-U-G

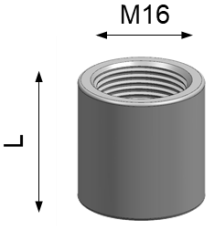
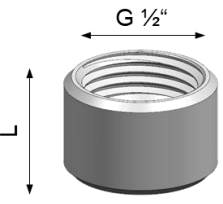
Illustration	Item number	Designation	Thread	L [mm]	Material
	216415	AM8x1000 4.8	M8	3000	Strength class 4.8 in accordance with DIN 976-1, zinc coated
	339794	AM8x2000 4.8	M8	2000	
	339793	AM8x3000 4.8	M8	1000	
	216418	AM10x3000 4.8	M10	3000	
	339796	AM10x2000 4.8	M10	2000	
	339795	AM10x1000 4.8	M10	1000	
	216424	AM16x3000 4.8	M16	3000	
	216423	AM16x2000 4.8	M16	2000	
	216422	AM16x1000 4.8	M16	1000	
	56428	GR-G 1/2" – 2m	G 1/2"	2000	Strength class 4.6, zinc coated

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Requirements for performance assessment

Annex B1

Table B2: Thread adapters for use with Hilti Ultimate Pipe clamps MP-U, MP-U-I and MP-U-G M8/10/O16

Illustration	Item number	Designation	Thread	L [mm]	Material
	2244772	MP-GA M16	M16	21	Property class ≥ 5 in accordance with ISO 898-2
	2244773	MP-GA 1/2"	G 1/2"	18.8	

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Requirements for performance assessment

Annex B2

Table C1: Characteristic tensile strength at ambient temperature for MP-U-I M8/10

Item number	Designation	Characteristic tensile strength F_{RK} [N]	Partial safety coefficient ¹⁾ γ_m [-]
2242258	MP-U-I 9-13 1/8" M8/10	1476	1,85
2242259	MP-U-I 13-17 1/4" M8/10		
2242260	MP-U-I 17-21 3/8" M8/10		
2242261	MP-U-I 21-25 1/2" M8/10		
2242262	MP-U-I 25-29 3/4" M8/10		
2242263	MP-U-I 29-33 M8/10		
2242264	MP-U-I 33-37 1" M8/10		
2242265	MP-U-I 37-42 M8/10	2196	2,75
2242266	MP-U-I 42-47 1 1/4" M8/10		
2242267	MP-U-I 47-52 1 1/2" M8/10		
2242268	MP-U-I 52-57 M8/10		
2242269	MP-U-I 57-62 2" M8/10		
2242270	MP-U-I 62-67 M8/10	4423	3,16
2242271	MP-U-I 67-72 M8/10		
2242272	MP-U-I 72-77 2 1/2" M8/10		
2242273	MP-U-I 78-84 M8/10		
2242274	MP-U-I 84-90 3" M8/10		
2242275	MP-U-I 90-96 M8/10		
2242276	MP-U-I 97-103 M8/10	4038	2,24
2242277	MP-U-I 103-109 M8/10		
2242278	MP-U-I 109-115 4" M8/10		
2242279	MP-U-I 115-121 M8/10		
2242280	MP-U-I 122-128 M8/10		
2242281	MP-U-I 129-135 M8/10		
2305365	MP-U-I 135-141 5" M8/10		
2305366	MP-U-I 141-147 M8/10	5061	2,11
2305367	MP-U-I 147-153 M8/10		
2305368	MP-U-I 154-160 M8/10		
2305369	MP-U-I 160-166 6" M8/10		
2305370	MP-U-I 164-170 M8/10		

¹⁾ provided that no other national regulations apply

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Characteristic tensile strength at ambient temperature

Annex C1

Table C2: Service load and deformation at ambient temperature for MP-U-I M8/10

Item number	Designation	Service load F _{SLs} [N]	Associated deformation [mm]
2242258	MP-U-I 9-13 1/8" M8/10	879	1,50
2242259	MP-U-I 13-17 1/4" M8/10		
2242260	MP-U-I 17-21 3/8" M8/10		
2242261	MP-U-I 21-25 1/2" M8/10		
2242262	MP-U-I 25-29 3/4" M8/10		
2242263	MP-U-I 29-33 M8/10		
2242264	MP-U-I 33-37 1" M8/10		
2242265	MP-U-I 37-42 M8/10	1053	1,50
2242266	MP-U-I 42-47 1 1/4" M8/10		
2242267	MP-U-I 47-52 1 1/2" M8/10		
2242268	MP-U-I 52-57 M8/10		
2242269	MP-U-I 57-62 2" M8/10		
2242270	MP-U-I 62-67 M8/10	1762	1,50
2242271	MP-U-I 67-72 M8/10		
2242272	MP-U-I 72-77 2 1/2" M8/10		
2242273	MP-U-I 78-84 M8/10		
2242274	MP-U-I 84-90 3" M8/10		
2242275	MP-U-I 90-96 M8/10		
2242276	MP-U-I 97-103 M8/10	2072	2,06
2242277	MP-U-I 103-109 M8/10		
2242278	MP-U-I 109-115 4" M8/10		
2242279	MP-U-I 115-121 M8/10		
2242280	MP-U-I 122-128 M8/10		
2242281	MP-U-I 129-135 M8/10		
2305365	MP-U-I 135-141 5" M8/10	2449	3,68
2305366	MP-U-I 141-147 M8/10		
2305367	MP-U-I 147-153 M8/10		
2305368	MP-U-I 154-160 M8/10		
2305369	MP-U-I 160-166 6" M8/10		
2305370	MP-U-I 164-170 M8/10		

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Service load and deformation at ambient temperature

Annex C2

Table C3: Characteristic tensile strength at ambient temperature for MP-U-I M8/10/O16

Item number	Designation	Characteristic tensile strength F_{Rk} [N]	Partial safety coefficient ¹⁾ γ_m [-]
2242308	MP-U-I 9-13 1/8" M8/10/O16	1476	1,85
2242309	MP-U-I 13-17 1/4" M8/10/O16		
2242310	MP-U-I 17-21 3/8" M8/10/O16		
2242311	MP-U-I 21-25 1/2" M8/10/O16		
2242312	MP-U-I 25-29 3/4" M8/10/O16		
2242313	MP-U-I 29-33 M8/10/O16		
2242314	MP-U-I 33-37 1" M8/10/O16		
2242315	MP-U-I 37-42 M8/10/O16	2196	2,75
2242316	MP-U-I 42-47 1 1/4" M8/10/O16		
2242317	MP-U-I 47-52 1 1/2" M8/10/O16		
2242318	MP-U-I 52-57 M8/10/O16		
2242319	MP-U-I 57-62 2" M8/10/O16		
2242320	MP-U-I 62-67 M8/10/O16	4423	3,16
2242321	MP-U-I 67-72 M8/10/O16		
2242322	MP-U-I 72-77 2 1/2" M8/10/O16		
2242323	MP-U-I 78-84 M8/10/O16		
2242324	MP-U-I 84-90 3" M8/10/O16		
2242325	MP-U-I 90-96 M8/10/O16		
2242326	MP-U-I 97-103 M8/10/O16	4038	2,24
2242327	MP-U-I 103-109 M8/10/O16		
2242328	MP-U-I 109-115 4" M8/10/O16		
2242329	MP-U-I 115-121 M8/10/O16		
2242330	MP-U-I 122-128 M8/10/O16		
2242331	MP-U-I 129-135 M8/10/O16		
2305377	MP-U-I 135-141 5" M8/10/O16	5061	2,11
2305378	MP-U-I 141-147 M8/10/O16		
2305379	MP-U-I 147-153 M8/10/O16		
2305380	MP-U-I 154-160 M8/10/O16		
2305381	MP-U-I 160-166 6" M8/10/O16		
2305382	MP-U-I 164-170 M8/10/O16		

¹⁾ provided that no other national regulations apply

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Characteristic tensile strength at ambient temperature

Annex C3

Table C4: Service load and deformation at ambient temperature for MP-U-I M8/10/O16

Item number	Designation	Service load F _{SLS} [N]	Associated deformation [mm]
2242308	MP-U-I 9-13 1/8" M8/10/O16	879	1,50
2242309	MP-U-I 13-17 1/4" M8/10/O16		
2242310	MP-U-I 17-21 3/8" M8/10/O16		
2242311	MP-U-I 21-25 1/2" M8/10/O16		
2242312	MP-U-I 25-29 3/4" M8/10/O16		
2242313	MP-U-I 29-33 M8/10/O16		
2242314	MP-U-I 33-37 1" M8/10/O16		
2242315	MP-U-I 37-42 M8/10/O16	1053	1,50
2242316	MP-U-I 42-47 1 1/4" M8/10/O16		
2242317	MP-U-I 47-52 1 1/2" M8/10/O16		
2242318	MP-U-I 52-57 M8/10/O16		
2242319	MP-U-I 57-62 2" M8/10/O16		
2242320	MP-U-I 62-67 M8/10/O16	1762	1,50
2242321	MP-U-I 67-72 M8/10/O16		
2242322	MP-U-I 72-77 2 1/2" M8/10/O16		
2242323	MP-U-I 78-84 M8/10/O16		
2242324	MP-U-I 84-90 3" M8/10/O16		
2242325	MP-U-I 90-96 M8/10/O16	2072	2,06
2242326	MP-U-I 97-103 M8/10/O16		
2242327	MP-U-I 103-109 M8/10/O16		
2242328	MP-U-I 109-115 4" M8/10/O16		
2242329	MP-U-I 115-121 M8/10/O16		
2242330	MP-U-I 122-128 M8/10/O16	2449	3,68
2242331	MP-U-I 129-135 M8/10/O16		
2305377	MP-U-I 135-141 5" M8/10/O16		
2305378	MP-U-I 141-147 M8/10/O16		
2305379	MP-U-I 147-153 M8/10/O16		
2305380	MP-U-I 154-160 M8/10/O16		
2305381	MP-U-I 160-166 6" M8/10/O16		
2305382	MP-U-I 164-170 M8/10/O16		

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Service load and deformation at ambient temperature

Annex C4

Table C5: Characteristic tensile strength at ambient temperature for MP-U-I M8/10½"

Item number	Designation	Characteristic tensile strength F_{Rk} [N]	Partial safety coefficient ¹⁾ γ_m [-]
2242283	MP-U-I 9-13 1/8" M8/10½"	1476	1,85
2242284	MP-U-I 13-17 ¼" M8/10½"		
2242285	MP-U-I 17-21 3/8" M8/10½"		
2242286	MP-U-I 21-25 ½" M8/10½"		
2242287	MP-U-I 25-29 ¾" M8/10½"		
2242288	MP-U-I 29-33 M8/10½"		
2242289	MP-U-I 33-37 1" M8/10½"		
2242290	MP-U-I 37-42 M8/10½"	2196	2,75
2242291	MP-U-I 42-47 1 ¼" M8/10½"		
2242292	MP-U-I 47-52 1 ½" M8/10½"		
2242293	MP-U-I 52-57 M8/10½"		
2242294	MP-U-I 57-62 2" M8/10½"		
2242295	MP-U-I 62-67 M8/10½"		
2242296	MP-U-I 67-72 M8/10½"	4423	3,16
2242297	MP-U-I 72-77 2 ½" M8/10½"		
2242298	MP-U-I 78-84 M8/10½"		
2242299	MP-U-I 84-90 3" M8/10½"		
2242300	MP-U-I 90-96 M8/10½"		
2242301	MP-U-I 97-103 M8/10½"		
2242302	MP-U-I 103-109 M8/10½"	4038	2,24
2242303	MP-U-I 109-115 4" M8/10½"		
2242304	MP-U-I 115-121 M8/10½"		
2242305	MP-U-I 122-128 M8/10½"		
2242306	MP-U-I 129-135 M8/10½"		
2305371	MP-U-I 135-141 5" M8/10½"		
2305372	MP-U-I 141-147 M8/10½"	5061	2,11
2305373	MP-U-I 147-153 M8/10½"		
2305374	MP-U-I 154-160 M8/10½"		
2305375	MP-U-I 160-166 6" M8/10½"		
2305376	MP-U-I 164-170 M8/10½"		

¹⁾ provided that no other national regulations apply

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Characteristic tensile strength at ambient temperature

Annex C5

Table C6: Service load and deformation at ambient temperature for MP-U-I M8/10½"

Item number	Designation	Service load F _{SLS} [N]	Associated deformation [mm]
2242283	MP-U-I 9-13 1/8" M8/10½"	879	1,50
2242284	MP-U-I 13-17 ¼" M8/10½"		
2242285	MP-U-I 17-21 3/8" M8/10½"		
2242286	MP-U-I 21-25 ½" M8/10½"		
2242287	MP-U-I 25-29 ¾" M8/10½"		
2242288	MP-U-I 29-33 M8/10½"		
2242289	MP-U-I 33-37 1" M8/10½"		
2242290	MP-U-I 37-42 M8/10½"	1053	1,50
2242291	MP-U-I 42-47 1 ¼" M8/10½"		
2242292	MP-U-I 47-52 1 ½" M8/10½"		
2242293	MP-U-I 52-57 M8/10½"		
2242294	MP-U-I 57-62 2" M8/10½"		
2242295	MP-U-I 62-67 M8/10½"	1762	1,50
2242296	MP-U-I 67-72 M8/10½"		
2242297	MP-U-I 72-77 2 ½" M8/10½"		
2242298	MP-U-I 78-84 M8/10½"		
2242299	MP-U-I 84-90 3" M8/10½"		
2242300	MP-U-I 90-96 M8/10½"	2072	2,06
2242301	MP-U-I 97-103 M8/10½"		
2242302	MP-U-I 103-109 M8/10½"		
2242303	MP-U-I 109-115 4" M8/10½"		
2242304	MP-U-I 115-121 M8/10½"		
2242305	MP-U-I 122-128 M8/10½"		
2242306	MP-U-I 129-135 M8/10½"	2449	3,68
2305371	MP-U-I 135-141 5" M8/10½"		
2305372	MP-U-I 141-147 M8/10½"		
2305373	MP-U-I 147-153 M8/10½"		
2305374	MP-U-I 154-160 M8/10½"		
2305375	MP-U-I 160-166 6" M8/10½"		
2305376	MP-U-I 164-170 M8/10½"		

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Service load and deformation at ambient temperature

Annex C6

Table C7: Characteristic tensile strength at ambient temperature for MP-U-I M8

Item number	Designation	Characteristic tensile strength F_{Rk} [N]	Partial safety coefficient ¹⁾ γ_m [-]
2242237	MP-U-I 9-13 1,8" M8	1476	1,85
2242238	MP-U-I 13-17 1/4" M8		
2242239	MP-U-I 17-21 3/8 M8		
2242250	MP-U-I 21-25 1/2" M8		
2242251	MP-U-I 25-29 3/4" M8		
2242252	MP-U-I 29-33 M8		
2242253	MP-U-I 33-37 1" M8		
2242254	MP-U-I 37-42 M8	2924	3,66
2242255	MP-U-I 42-47 1 1/4" M8		
2242256	MP-U-I 47-52 1 1/2" M8		
2305363	MP-U-I 52-57 M8		
2305364	MP-U-I 57-62 2" M8		

¹⁾ provided that no other national regulations apply

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Characteristic tensile strength at ambient temperature

Annex C7

Table C8: Service load and deformation at ambient temperature for MP-U-I M8

Item number	Designation	Service load F_{SLS} [N]	Associated deformation [mm]
2242237	MP-U-I 9-13 1,8" M8	943	1,50
2242238	MP-U-I 13-17 1/4" M8		
2242239	MP-U-I 17-21 3/8 M8		
2242250	MP-U-I 21-25 1/2" M8		
2242251	MP-U-I 25-29 3/4" M8		
2242252	MP-U-I 29-33 M8		
2242253	MP-U-I 33-37 1" M8		
2242254	MP-U-I 37-42 M8	946	1,50
2242255	MP-U-I 42-47 1 1/4" M8		
2242256	MP-U-I 47-52 1 1/2" M8		
2305363	MP-U-I 52-57 M8		
2305364	MP-U-I 57-62 2" M8		

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Service load and deformation at ambient temperature

Annex C8

Table C9: Characteristic tensile strength at ambient temperature for MP-U M8/10

Item number	Designation	Characteristic tensile strength F_{Rk} [N]	Partial safety coefficient ¹⁾ γ_m [-]
2242334	MP-U 13-17 ¼" M8/10	1476	1,85
2242335	MP-U 16-20 3/8" M8/10		
2242336	MP-U 20-24 ½" M8/10		
2242337	MP-U 25-29 ¾" M8/10		
2242338	MP-U 30-34 M8/10		
2242339	MP-U 34-38 1" M8/10		
2242340	MP-U 38-42 M8/10		
2242341	MP-U 42-47 1 ¼" M8/10	2196	2,75
2242342	MP-U 47-52 1 ½" M8/10		
2242343	MP-U 52-57 M8/10		
2242344	MP-U 57-62 2" M8/10		
2242345	MP-U 62-67 M8/10		
2242346	MP-U 67-72 M8/10	4423	3,16
2242347	MP-U 72-77 2 ½" M8/10		
2242348	MP-U 77-82 M8/10		
2242349	MP-U 83-89 3" M8/10		
2242350	MP-U 89-95 M8/10		
2242351	MP-U 95-101 M8/10		
2242352	MP-U 102-108 M8/10		
2242353	MP-U 109-115 4" M8/10	4038	2,24
2242354	MP-U 115-121 M8/10		
2242355	MP-U 121-127 M8/10		
2242356	MP-U 128-134 M8/10		
2242357	MP-U 135-141 5" M8/10		
2305351	MP-U 141-147 M8/10	5061	2,11
2305352	MP-U 147-153 M8/10		
2305353	MP-U 153-159 M8/10		
2305354	MP-U 160-166 6" M8/10		
2305355	MP-U 166-172 M8/10		
2305356	MP-U 170-176 M8/10		

¹⁾ provided that no other national regulations apply

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Characteristic tensile strength at ambient temperature

Annex C9

Table C10: Service load and deformation at ambient temperature for MP-U M8/10

Item number	Designation	Service load F _{SLs} [N]	Associated deformation [mm]
2242334	MP-U 13-17 ¼" M8/10	879	1,50
2242335	MP-U 16-20 3/8" M8/10		
2242336	MP-U 20-24 ½" M8/10		
2242337	MP-U 25-29 ¾" M8/10		
2242338	MP-U 30-34 M8/10		
2242339	MP-U 34-38 1" M8/10		
2242340	MP-U 38-42 M8/10		
2242341	MP-U 42-47 1 ¼" M8/10	1053	1,50
2242342	MP-U 47-52 1 ½" M8/10		
2242343	MP-U 52-57 M8/10		
2242344	MP-U 57-62 2" M8/10		
2242345	MP-U 62-67 M8/10		
2242346	MP-U 67-72 M8/10		
2242347	MP-U 72-77 2 ½" M8/10	1762	1,50
2242348	MP-U 77-82 M8/10		
2242349	MP-U 83-89 3" M8/10		
2242350	MP-U 89-95 M8/10		
2242351	MP-U 95-101 M8/10		
2242352	MP-U 102-108 M8/10		
2242353	MP-U 109-115 4" M8/10	2072	2,06
2242354	MP-U 115-121 M8/10		
2242355	MP-U 121-127 M8/10		
2242356	MP-U 128-134 M8/10		
2242357	MP-U 135-141 5" M8/10		
2305351	MP-U 141-147 M8/10		
2305352	MP-U 147-153 M8/10	2449	3,68
2305353	MP-U 153-159 M8/10		
2305354	MP-U 160-166 6" M8/10		
2305355	MP-U 166-172 M8/10		
2305356	MP-U 170-176 M8/10		

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Service load and deformation at ambient temperature

Annex C10

Table C11: Characteristic tensile strength at ambient temperature for MP-U M8/10½"

Item number	Designation	Characteristic tensile strength F_{Rk} [N]	Partial safety coefficient ¹⁾ γ_m [-]
2242359	MP-U 13-17 ¼" M8/10½"	1476	1,85
2242360	MP-U 16-20 3/8" M8/10½"		
2242361	MP-U 20-24 ½" M8/10½"		
2242362	MP-U 25-29 ¾" M8/10½"		
2242363	MP-U 30-34 M8/10½"		
2242364	MP-U 34-38 1" M8/10½"		
2242365	MP-U 38-42 M8/10½"		
2242366	MP-U 42-47 1 ¼" M8/10½"	2196	2,75
2242367	MP-U 47-52 1 ½" M8/10½"		
2242368	MP-U 52-57 M8/10½"		
2242369	MP-U 57-62 2" M8/10½"		
2242370	MP-U 62-67 M8/10½"		
2242371	MP-U 67-72 M8/10½"	4423	3,16
2242372	MP-U 72-77 2 ½" M8/10½"		
2242373	MP-U 77-82 M8/10½"		
2242374	MP-U 83-89 3" M8/10½"		
2242375	MP-U 89-95 M8/10½"		
2242376	MP-U 95-101 M8/10½"		
2242377	MP-U 102-108 M8/10½"	4038	2,24
2242378	MP-U 109-115 4" M8/10½"		
2242379	MP-U 115-121 M8/10½"		
2242380	MP-U 121-127 M8/10½"		
2242235	MP-U 128-134 M8/10½"		
2242332	MP-U 135-141 5" M8/10½"		
2305357	MP-U 141-147 M8/10½"	5061	2,11
2305358	MP-U 147-153 M8/10½"		
2305359	MP-U 153-159 M8/10½"		
2305360	MP-U 160-166 6" M8/10½"		
2305361	MP-U 166-172 M8/10½"		
2305362	MP-U 170-176 M8/10½"		

¹⁾ provided that no other national regulations apply

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Characteristic tensile strength at ambient temperature

Annex C11

Table C12: Service load and deformation at ambient temperature for MP-U M8/10½"

Item number	Designation	Service load F _{SL} [N]	Associated deformation [mm]
2242359	MP-U 13-17 ¼" M8/10½"	879	1,50
2242360	MP-U 16-20 3/8" M8/10½"		
2242361	MP-U 20-24 ½" M8/10½"		
2242362	MP-U 25-29 ¾" M8/10½"		
2242363	MP-U 30-34 M8/10½"		
2242364	MP-U 34-38 1" M8/10½"		
2242365	MP-U 38-42 M8/10½"		
2242366	MP-U 42-47 1 ¼" M8/10½"	1053	1,50
2242367	MP-U 47-52 1 ½" M8/10½"		
2242368	MP-U 52-57 M8/10½"		
2242369	MP-U 57-62 2" M8/10½"		
2242370	MP-U 62-67 M8/10½"		
2242371	MP-U 67-72 M8/10½"		
2242372	MP-U 72-77 2 ½" M8/10½"	1762	1,50
2242373	MP-U 77-82 M8/10½"		
2242374	MP-U 83-89 3" M8/10½"		
2242375	MP-U 89-95 M8/10½"		
2242376	MP-U 95-101 M8/10½"		
2242377	MP-U 102-108 M8/10½"		
2242378	MP-U 109-115 4" M8/10½"	2072	2,06
2242379	MP-U 115-121 M8/10½"		
2242380	MP-U 121-127 M8/10½"		
2242235	MP-U 128-134 M8/10½"		
2242332	MP-U 135-141 5" M8/10½"		
2305357	MP-U 141-147 M8/10½"		
2305358	MP-U 147-153 M8/10½"	2449	3,68
2305359	MP-U 153-159 M8/10½"		
2305360	MP-U 160-166 6" M8/10½"		
2305361	MP-U 166-172 M8/10½"		
2305362	MP-U 170-176 M8/10½"		

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Service load and deformation at ambient temperature

Annex C12

Table C13: Characteristic tensile strength at ambient temperature for MP-U-G M8

Item number	Designation	Characteristic tensile strength F_{Rk} [N]	Partial safety coefficient ¹⁾ γ_m [-]
2275028	MP-U-G 16 M8	2630	3,33
2275029	MP-U-G 20 M8		
2275030	MP-U-G 25 M8		
2275031	MP-U-G 32 M8		
2275032	MP-U-G 40 M8		
2275033	MP-U-G 50 M8		
2275034	MP-U-G 56 M8		

¹⁾ provided that no other national regulations apply

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Characteristic tensile strength at ambient temperature

Annex C13

Table C14: Characteristic tensile strength at ambient temperature for MP-U-G M8/10

Item number	Designation	Characteristic tensile strength F_{Rk} [N]	Partial safety coefficient ¹⁾ γ_m [-]
2275028	MP-U-G 16 M8/10	2630	3,33
2275029	MP-U-G 20 M8/10		
2275030	MP-U-G 25 M8/10		
2275031	MP-U-G 32 M8/10		
2275032	MP-U-G 40 M8/10		
2275033	MP-U-G 50 M8/10		
2275034	MP-U-G 56 M8/10		
2275035	MP-U-G 63 M8/10	6108	4,36
2275036	MP-U-G 75 M8/10		
2275037	MP-U-G 90 M8/10	6588	3,66
2275038	MP-U-G 110 M8/10		
2275039	MP-U-G 125 M8/10		
2275040	MP-U-G 135 M8/10	7413	3,09
2275041	MP-U-G 160 M8/10		

¹⁾ provided that no other national regulations apply

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Characteristic tensile strength at ambient temperature

Annex C14

Table C15: Characteristic tensile strength at ambient temperature for MP-U-G M8/10½"

Item number	Designation	Characteristic tensile strength F_{Rk} [N]	Partial safety coefficient ¹⁾ γ_M [-]
2275042	MP-U-G 50 M8/10½"	2630	3,33
2275043	MP-U-G 56 M8/10½"		
2275044	MP-U-G 63 M8/10½"	6108	4,36
2275045	MP-U-G 75 M8/10½"		
2275046	MP-U-G 90 M8/10½"	6588	3,66
2275047	MP-U-G 110 M8/10½"		
2275048	MP-U-G 125 M8/10½"		
2275049	MP-U-G 135 M8/10½"	7413	3,09
2274899	MP-U-G 160 M8/10½"		

¹⁾ provided that no other national regulations apply

Hilti ultimate pipe clamps MP-U, MP-U-I and MP-U-G

Characteristic tensile strength at ambient temperature

Annex C15

Table D1: Resistance of $F_{Rk,t}$ of ultimate pipe rings MP-U-I 9-13 – MP-U-I 33-37 and MP-U 13-17 – MP-U 38-42 in case of fire after $t = 30, 60$ and 90 minutes

Item number	Designation	Parameter of regression curve	$F_{Rk,t}$ [N]		
		$F_{Rk}(t) = c_3 (c_1 + c_2 / t)$	$F_{Rk,30}$	$F_{Rk,60}$	$F_{Rk,90}$
2242258	MP-U-I 9-13 1/8" M8/10	$c_1 = 80,6628$ $c_2 = 6412,2993$ $c_3 = 0,72904$ $21 \text{ min} \leq t \leq 98 \text{ min}$	214,6	136,7	110,7
2242259	MP-U-I 13-17 1/4" M8/10				
2242260	MP-U-I 17-21 3/8" M8/10				
2242261	MP-U-I 21-25 1/2" M8/10				
2242262	MP-U-I 25-29 3/4" M8/10				
2242263	MP-U-I 29-33 M8/10				
2242264	MP-U-I 33-37 1" M8/10				
2242334	MP-U 13-17 1/4" M8/10				
2242335	MP-U 16-20 3/8" M8/10				
2242336	MP-U 20-24 1/2" M8/10				
2242337	MP-U 25-29 3/4" M8/10				
2242338	MP-U 30-34 M8/10				
2242339	MP-U 34-38 1" M8/10				
2242340	MP-U 38-42 M8/10				

Designation

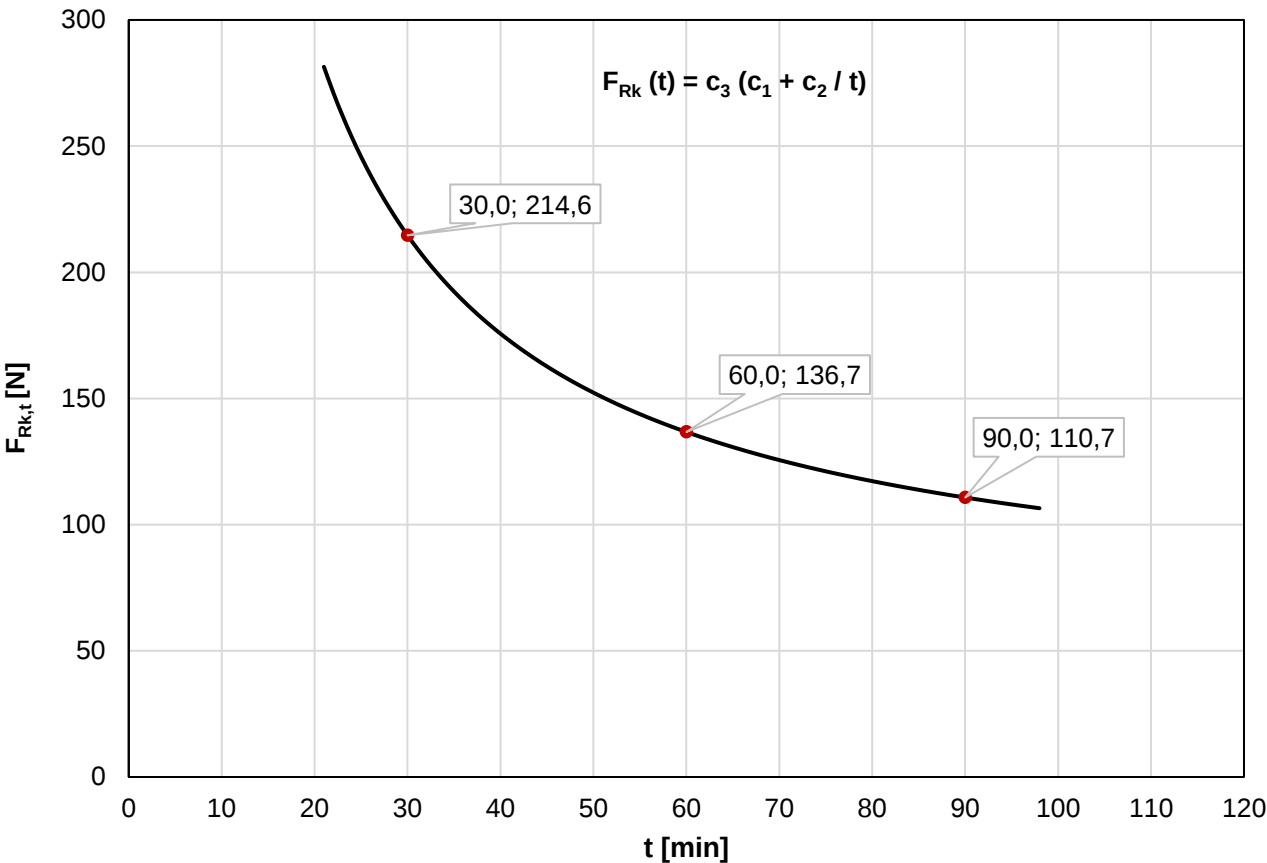
$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]
 $F_{Rk}(t)$ Resistance time function in case of fire [N]

Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 9-13 – MP-U-I 33-37 and MP-U 13-17 – MP-U 38-42

Annex D1

Figure D1: Regression curve according to Table D1



Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 9-13 – MP-U-I 33-37 and MP-U 13-17 – MP-U 38-42

Annex D2

Table D2: Resistance of $F_{Rk,t}$ of ultimate pipe rings MP-U-I 9-13 – MP-U-I 33-37 and MP-U 13-17 – MP-U 38-42 in case of fire after $t = 30, 60$ and 90 minutes

Item number	Designation	Parameter of regression curve	$F_{Rk,t}$ [N]		
		$F_{Rk}(t) = c_3 (c_1 + c_2 / t)$	$F_{Rk,30}$	$F_{Rk,60}$	$F_{Rk,90}$
2242308	MP-U-I 9-13 1/8" M8/10/O16	$c_1 = 80,6628$ $c_2 = 5131,1219$ $c_3 = 0,72904$ $21 \text{ min} \leq t \leq 98 \text{ min}$	183,5	121,1	100,4
2242309	MP-U-I 13-17 1/4" M8/10/O16				
2242310	MP-U-I 17-21 3/8" M8/10/O16				
2242311	MP-U-I 21-25 1/2" M8/10/O16				
2242312	MP-U-I 25-29 3/4" M8/10/O16				
2242313	MP-U-I 29-33 M8/10/O16				
2242314	MP-U-I 33-37 1" M8/10/O16				
2242283	MP-U-I 9-13 1/8" M8/10/1/2"				
2242284	MP-U-I 13-17 1/4" M8/10/1/2"				
2242285	MP-U-I 17-21 3/8" M8/10/1/2"				
2242286	MP-U-I 21-25 1/2" M8/10/1/2"				
2242287	MP-U-I 25-29 3/4" M8/10/1/2"				
2242288	MP-U-I 29-33 M8/10/1/2"				
2242289	MP-U-I 33-37 1" M8/10/1/2"				
2242359	MP-U 13-17 1/4" M8/10/1/2"				
2242360	MP-U 16-20 3/8" M8/10/1/2"				
2242361	MP-U 20-24 1/2" M8/10/1/2"				
2242362	MP-U 25-29 3/4" M8/10/1/2"				
2242363	MP-U 30-34 M8/10/1/2"				
2242364	MP-U 34-38 1" M8/10/1/2"				
2242365	MP-U 38-42 M8/10/1/2"				

Designation

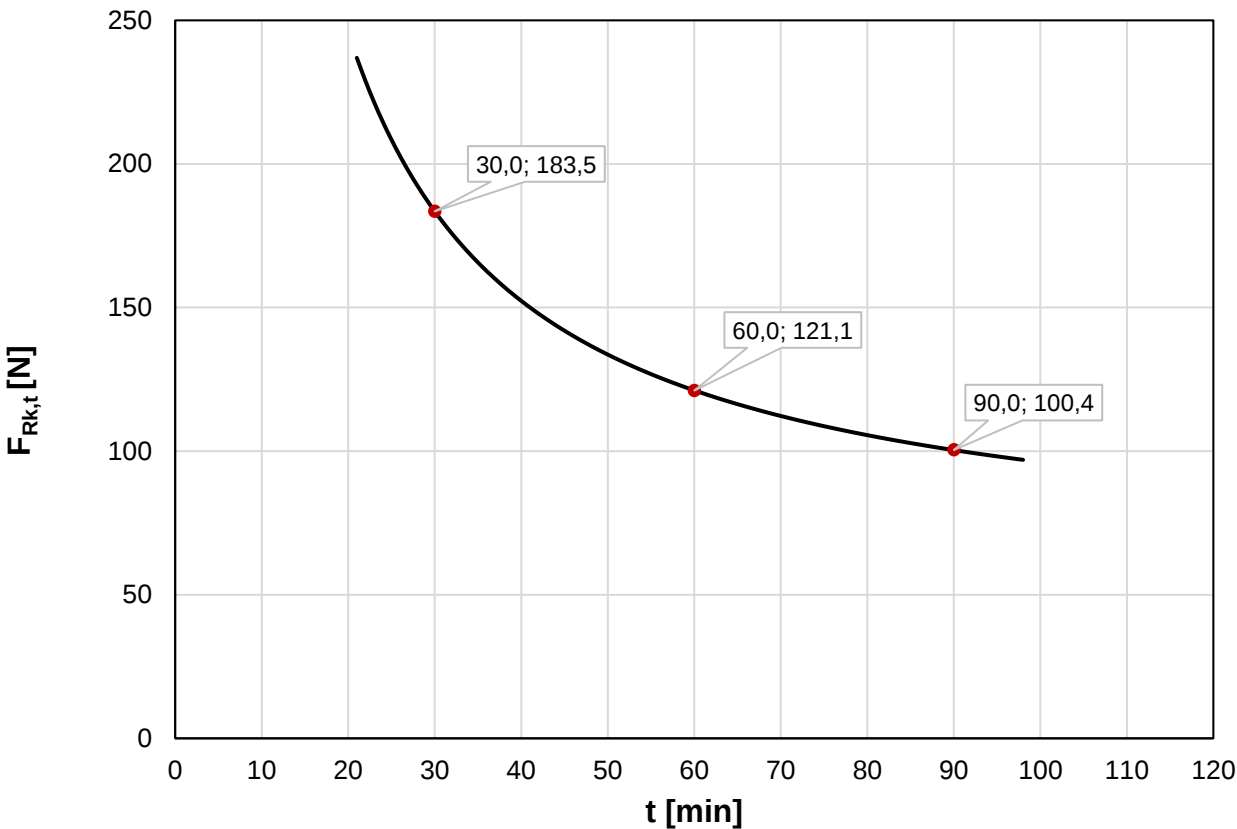
$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]
 $F_{Rk}(t)$ Resistance time function in case of fire [N]

Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 9-13 – MP-U-I 33-37 and MP-U 13-17 – MP-U 38-42

Annex D3

Figure D2: Regression curve according to Table D2



Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
 MP-U-I 9-13 – MP-U-I 33-37 and MP-U 13-17 – MP-U 38-42

Annex D4

Table D3: Load displacement function and deformations of ultimate pipe rings
MP-U-I 9-13 – MP-U-I 33-37 and MP-U 13-17 – MP-U 38-42

Item number	Designation	Parameter of regression curve	$F_{Rk,30}(\delta)$ [N]				$\delta_{max,t}$ [mm]	
		$F_{Rk,30}(\delta) = a_3(a_1 + \delta^{a_2})$	$F_{Rk,30}(12)$	$F_{Rk,30}(16)$	$F_{Rk,30}(18)$	$F_{Rk,30}(20)$	$\delta_{max,60}$	$\delta_{max,90}$
2242258	MP-U-I 9-13 1/8" M8/10	$a_1 = 9,3219$ $a_2 = 1,1165$ $a_3 = 0,721$ $10 \text{ mm} \leq \delta \leq 22 \text{ mm}$	107,7	148,5	169,4	190,6	29,6	29,6
2242259	MP-U-I 13-17 1/4" M8/10							
2242260	MP-U-I 17-21 3/8" M8/10							
2242261	MP-U-I 21-25 1/2" M8/10							
2242262	MP-U-I 25-29 3/4" M8/10							
2242263	MP-U-I 29-33 M8/10							
2242264	MP-U-I 33-37 1" M8/10							
2242334	MP-U 13-17 1/4" M8/10							
2242335	MP-U 16-20 3/8" M8/10							
2242336	MP-U 20-24 1/2" M8/10							
2242337	MP-U 25-29 3/4" M8/10							
2242338	MP-U 30-34 M8/10							
2242339	MP-U 34-38 1" M8/10							
2242340	MP-U 38-42 M8/10							
2242308	MP-U-I 9-13 1/8" M8/10/O16							
2242309	MP-U-I 13-17 1/4" M8/10/O16							
2242310	MP-U-I 17-21 3/8" M8/10/O16							
2242311	MP-U-I 21-25 1/2" M8/10/O16							
2242312	MP-U-I 25-29 3/4" M8/10/O16							
2242313	MP-U-I 29-33 M8/10/O16							
2242314	MP-U-I 33-37 1" M8/10/O16							
2242283	MP-U-I 9-13 1/8" M8/10/1/2"							
2242284	MP-U-I 13-17 1/4" M8/10/1/2"							
2242285	MP-U-I 17-21 3/8" M8/10/1/2"							
2242286	MP-U-I 21-25 1/2" M8/10/1/2"							
2242287	MP-U-I 25-29 3/4" M8/10/1/2"							
2242288	MP-U-I 29-33 M8/10/1/2"							
2242289	MP-U-I 33-37 1" M8/10/1/2"							
2242359	MP-U 13-17 1/4" M8/10/1/2"							
2242360	MP-U 16-20 3/8" M8/10/1/2"							
2242361	MP-U 20-24 1/2" M8/10/1/2"							
2242362	MP-U 25-29 3/4" M8/10/1/2"							
2242363	MP-U 30-34 M8/10/1/2"							
2242364	MP-U 34-38 1" M8/10/1/2"							
2242365	MP-U 38-42 M8/10/1/2"							

Designation

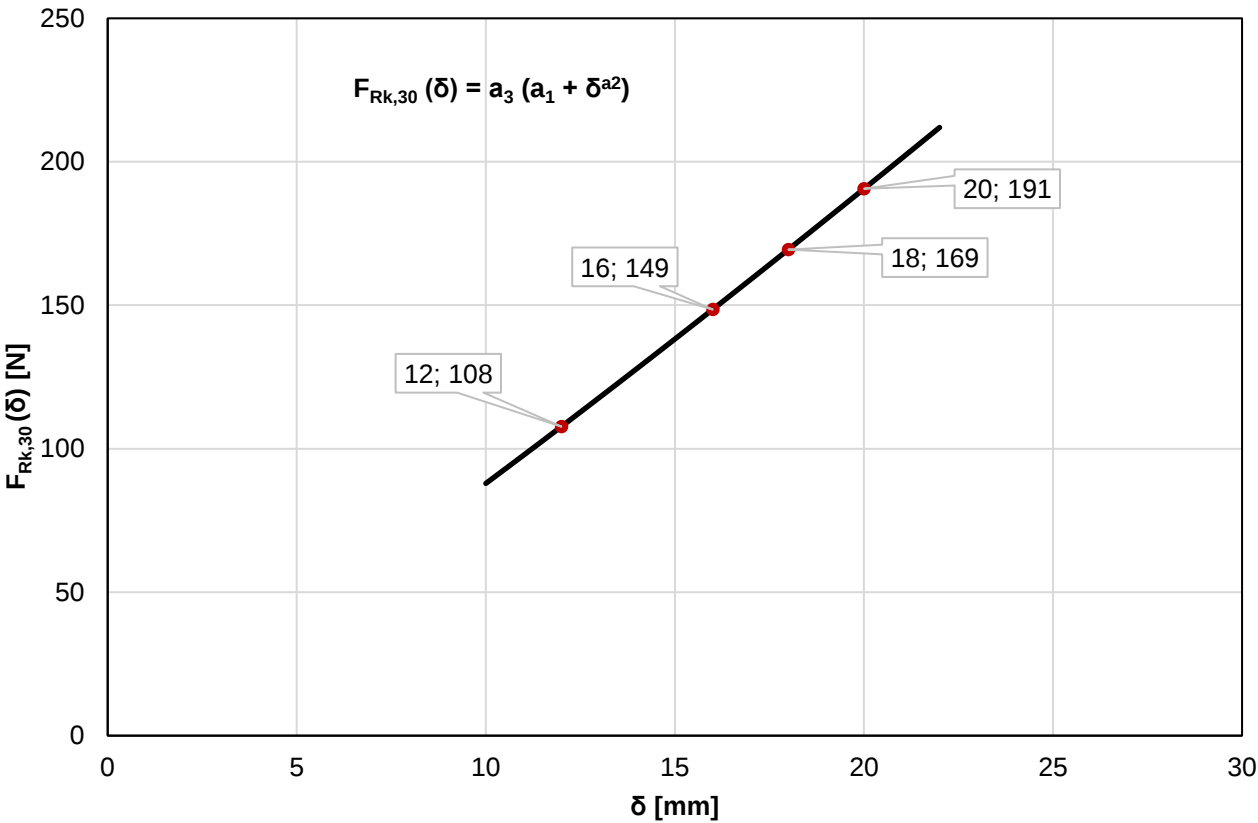
δ Deformation
 $\delta_{max,t}$ Maximum deformation after an exposure time $\leq t$ minutes in case of fire
 $F_{Rk,30}(\delta)$ Load displacement function for an exposure time $t = 30$ minutes in case of fire

Hilti ultimate pipe clamps MP-U-I and MP-U

Load displacement function and deformations in case of fire of ultimate pipe rings MP-U-I 9-13 – MP-U-I 33-37 and MP-U 13-17 – MP-U 38-42

Annex D6

Figure D3: Regression curve according to Table D3



Hilti ultimate pipe clamps MP-U-I and MP-U

Load displacement function and deformations in case of fire of ultimate pipe rings MP-U-I 9-13 – MP-U-I 33-37 and MP-U 13-17 – MP-U 38-42

Annex D6

Table D4: Resistance $F_{Rk,t}$ of ultimate pipe rings MP-U-I 37-42 – MP-U-I 57-62 and MP-U 42-47 – MP-U 62-67 in case of fire after $t = 30, 60$ and 90 minutes

Item number	Designation	Parameter of regression curve	$F_{Rk,t}$ [N]		
		$F_{Rk}(t) = c_3 (c_1 + c_2 / t)$	$F_{Rk,30}$	$F_{Rk,60}$	$F_{Rk,90}$
2242265	MP-U-I 37-42 M8/10	$c_1 = 55,9523$ $c_2 = 9035,2538$ $c_3 = 0,879447$ $23 \text{ min} \leq t \leq 92 \text{ min}$	314,1	181,6	137,5
2242266	MP-U-I 42-47 1 ¼" M8/10				
2242267	MP-U-I 47-52 1 ½" M8/10				
2242268	MP-U-I 52-57 M8/10				
2242269	MP-U-I 57-62 2" M8/10				
2242341	MP-U 42-47 1 ¼" M8/10				
2242342	MP-U 47-52 1 ½" M8/10				
2242343	MP-U 52-57 M8/10				
2242344	MP-U 57-62 2" M8/10				
2242345	MP-U 62-67 M8/10				

Designation

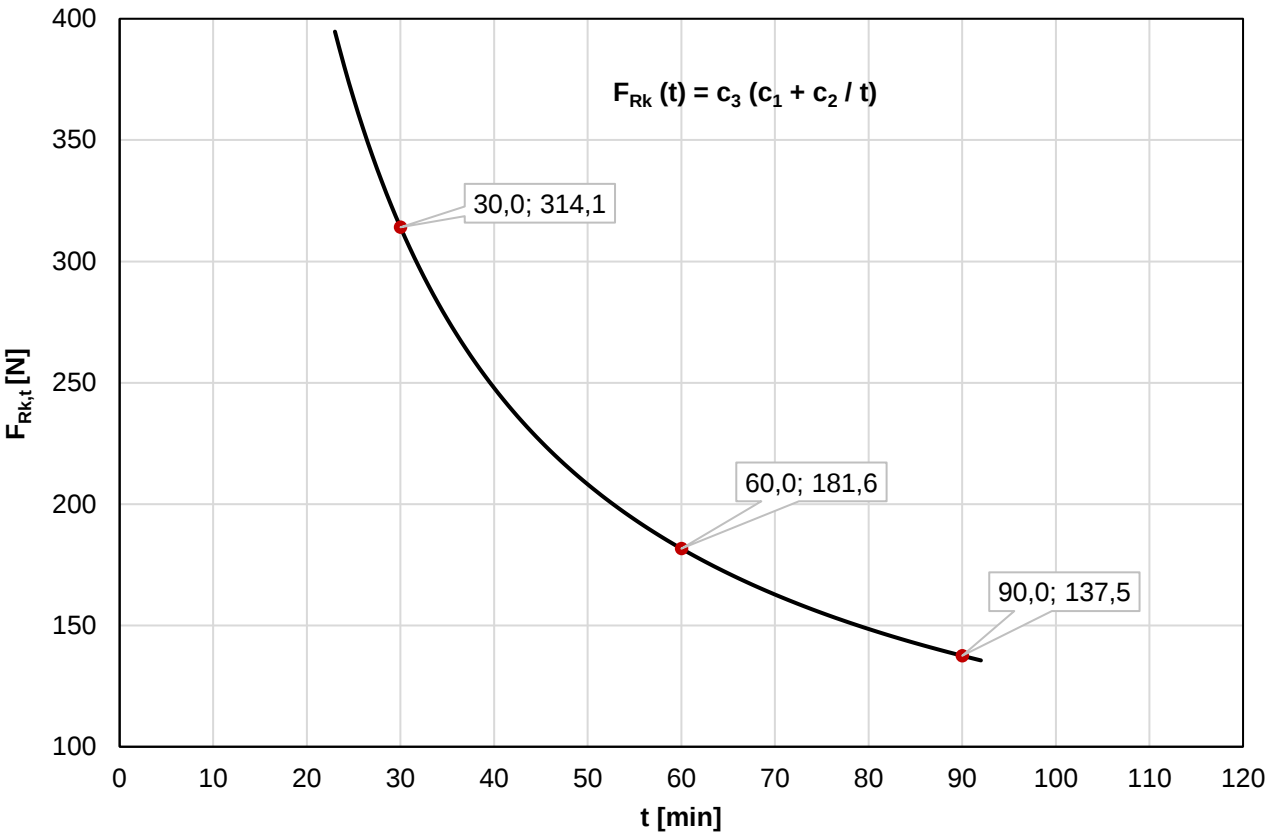
$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]
 $F_{Rk}(t)$ Resistance time function in case of fire [N]

Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 37-42 – MP-U-I 57-62 and MP-U 42-47 – MP-U 62-67

Annex D7

Figure D4: Regression curve according to Table D4



Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 37-42 – MP-U-I 57-62 and MP-U 42-47 – MP-U 62-67

Annex D8

Table D5: Resistance $F_{Rk,t}$ of ultimate pipe rings MP-U-I 37-42 – MP-U-I 57-62 and MP-U 42-47 – MP-U 62-67 in case of fire after $t = 30, 60$ and 90 minutes

Item number	Designation	Parameter of regression curve	$F_{Rk,t}$ [N]		
		$F_{Rk}(t) = c_3 (c_1 + c_2 / t)$	$F_{Rk,30}$	$F_{Rk,60}$	$F_{Rk,90}$
2242315	MP-U-I 37-42 M8/10/O16	$c_1 = 55,9523$ $c_2 = 7228,20304$ $c_3 = 0,879447$ $23 \text{ min} \leq t \leq 92 \text{ min}$	261,1	155,2	119,8
2242316	MP-U-I 42-47 1 ¼" M8/10/O16				
2242317	MP-U-I 47-52 1 ½" M8/10/O16				
2242318	MP-U-I 52-57 M8/10/O16				
2242319	MP-U-I 57-62 2" M8/10/O16				
2242290	MP-U-I 37-42 M8/10/½"				
2242291	MP-U-I 42-47 1 ¼" M8/10/½"				
2242292	MP-U-I 47-52 1 ½" M8/10/½"				
2242293	MP-U-I 52-57 M8/10/½"				
2242294	MP-U-I 57-62 2" M8/10/½"				
2242366	MP-U 42-47 1 ¼" M8/10/½"				
2242367	MP-U 47-52 1 ½" M8/10/½"				
2242368	MP-U 52-57 M8/10/½"				
2242369	MP-U 57-62 2" M8/10/½"				
2242370	MP-U 62-67 M8/10/½"				

Designation

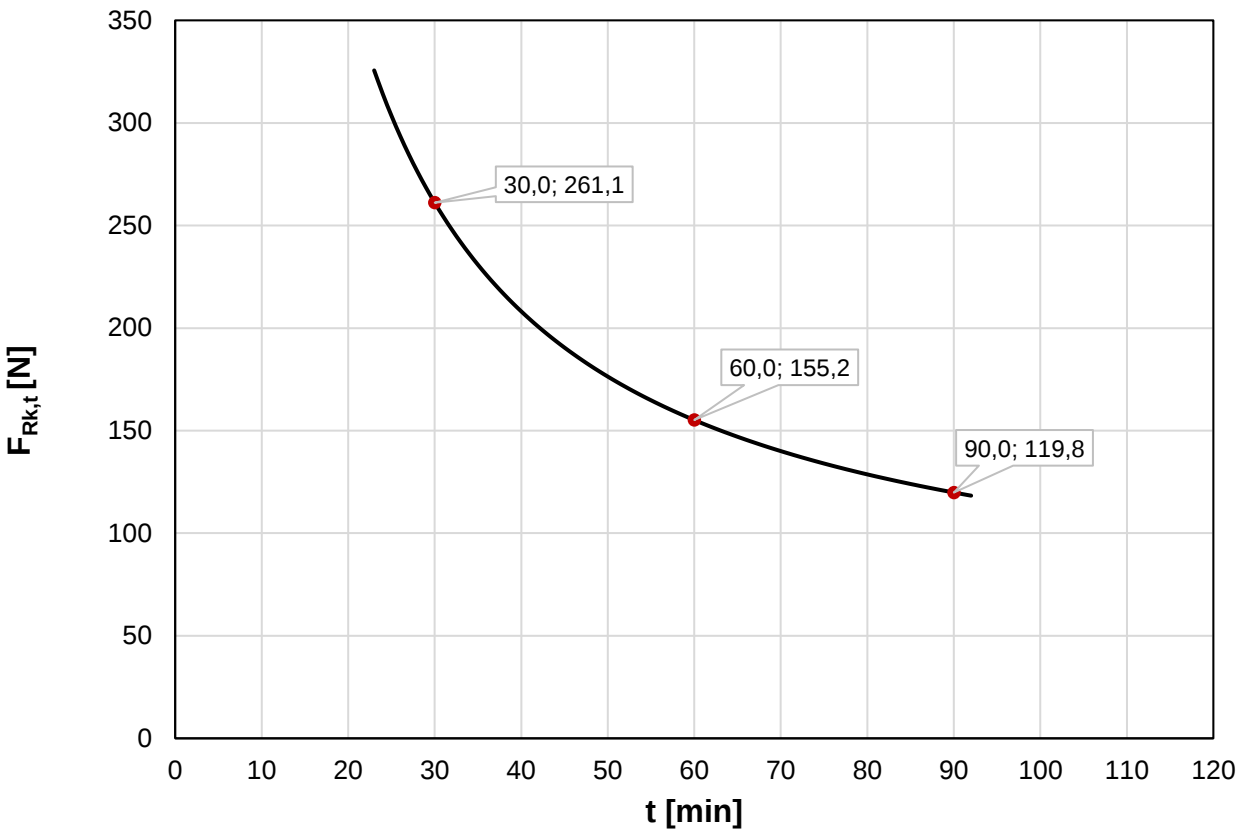
$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]
 $F_{Rk}(t)$ Resistance time function in case of fire [N]

Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 37-42 – MP-U-I 57-62 and MP-U 42-47 – MP-U 62-67

Annex D9

Figure D5: Regression curve according to Table D5



Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 37-42 – MP-U-I 57-62 and MP-U 42-47 – MP-U 62-67

Annex D10

Table D6: Load displacement function and deformations of ultimate pipe rings
MP-U-I 37-42 – MP-U-I 57-62 and MP-U 42-47 – MP-U 62-67 in case of fire

Item number	Designation	Parameter of regression curve	$F_{Rk,30}(\delta)$ [N]				$\delta_{max,t}$ [mm]	
		$F_{Rk,30}(\delta) = a_3(a_1 + \delta^{a_2})$	$F_{Rk,30}(16)$	$F_{Rk,30}(18)$	$F_{Rk,30}(20)$	$F_{Rk,30}(24)$	$\delta_{max,60}$	$\delta_{max,90}$
2242265	MP-U-I 37-42 M8/10	$a_1 = 1,0994$ $a_2 = 1,7722$ $a_3 = 0,8345$ $14 \text{ mm} \leq \delta \leq 25 \text{ mm}$	124,9	153,9	185,5	256,2	36,9	36,9
2242266	MP-U-I 42-47 1 ¼" M8/10							
2242267	MP-U-I 47-52 1 ½" M8/10							
2242268	MP-U-I 52-57 M8/10							
2242269	MP-U-I 57-62 2" M8/10							
2242341	MP-U 42-47 1 ¼" M8/10							
2242342	MP-U 47-52 1 ½" M8/10							
2242343	MP-U 52-57 M8/10							
2242344	MP-U 57-62 2" M8/10							
2242345	MP-U 62-67 M8/10							
2242315	MP-U-I 37-42 M8/10/O16							
2242316	MP-U-I 42-47 1 ¼" M8/10/O16							
2242317	MP-U-I 47-52 1 ½" M8/10/O16							
2242318	MP-U-I 52-57 M8/10/O16							
2242319	MP-U-I 57-62 2" M8/10/O16							
2242290	MP-U-I 37-42 M8/10/½"							
2242291	MP-U-I 42-47 1 ¼" M8/10/½"							
2242292	MP-U-I 47-52 1 ½" M8/10/½"							
2242293	MP-U-I 52-57 M8/10/½"							
2242294	MP-U-I 57-62 2" M8/10/½"							
2242366	MP-U 42-47 1 ¼" M8/10/½"							
2242367	MP-U 47-52 1 ½" M8/10/½"							
2242368	MP-U 52-57 M8/10/½"							
2242369	MP-U 57-62 2" M8/10/½"							
2242370	MP-U 62-67 M8/10/½"							

Symbols and designation

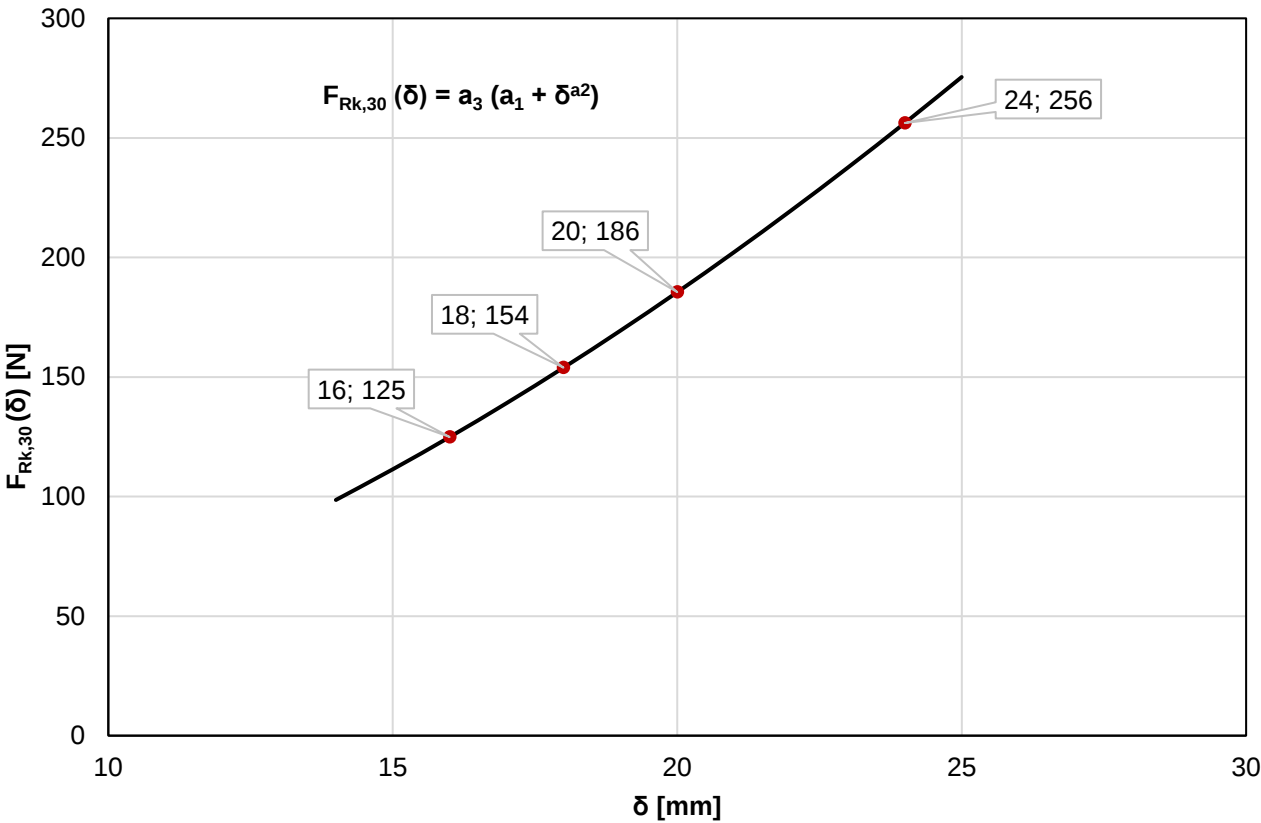
δ	Deformation
$\delta_{max,t}$	Maximum deformation after an exposure time $\leq t$ minutes in case of fire
$F_{Rk,30}(\delta)$	Load displacement function for an exposure time $t = 30$ minutes in case of fire

Hilti ultimate pipe clamps MP-U-I and MP-U

Load displacement function and deformations in case of fire of ultimate pipe rings MP-U-I 37-42 – MP-U-I 57-62 and MP-U 42-47 – MP-U 62-67

Annex D11

Figure D6: Regression curve according to Table D6



Hilti ultimate pipe clamps MP-U-I and MP-U

Load displacement function and deformations in case of fire of ultimate pipe rings MP-U-I 37-42 – MP-U-I 57-62 and MP-U 42-47 – MP-U 62-67

Annex D12

Table D7: Resistance $F_{Rk,t}$ of ultimate pipe rings MP-U-I 62-67 – MP-U-I 90-96 and MP-U 67-72 – MP-U 95-101 in case of fire after $t = 30, 60$ and 90 minutes

Item number	Designation	Parameter of regression curve	$F_{Rk,t}$ [N]		
		$F_{Rk}(t) = c_3 (c_1 + c_2 / t)$	$F_{Rk,30}$	$F_{Rk,60}$	$F_{Rk,90}$
2242270	MP-U-I 62-67 M8/10	$c_1 = 102,2415$ $c_2 = 19244,9886$ $c_3 = 0,92677$ $29 \text{ min} \leq t \leq 91 \text{ min}$	689,3	392,0	292,9
2242271	MP-U-I 67-72 M8/10				
2242272	MP-U-I 72-77 2 ½" M8/10				
2242273	MP-U-I 78-84 M8/10				
2242274	MP-U-I 84-90 3" M8/10				
2242275	MP-U-I 90-96 M8/10				
2242346	MP-U 67-72 M8/10				
2242347	MP-U 72-77 2 ½" M8/10				
2242348	MP-U 77-82 M8/10				
2242349	MP-U 83-89 3" M8/10				
2242350	MP-U 89-95 M8/10				
2242351	MP-U 95-101 M8/10				

Designation

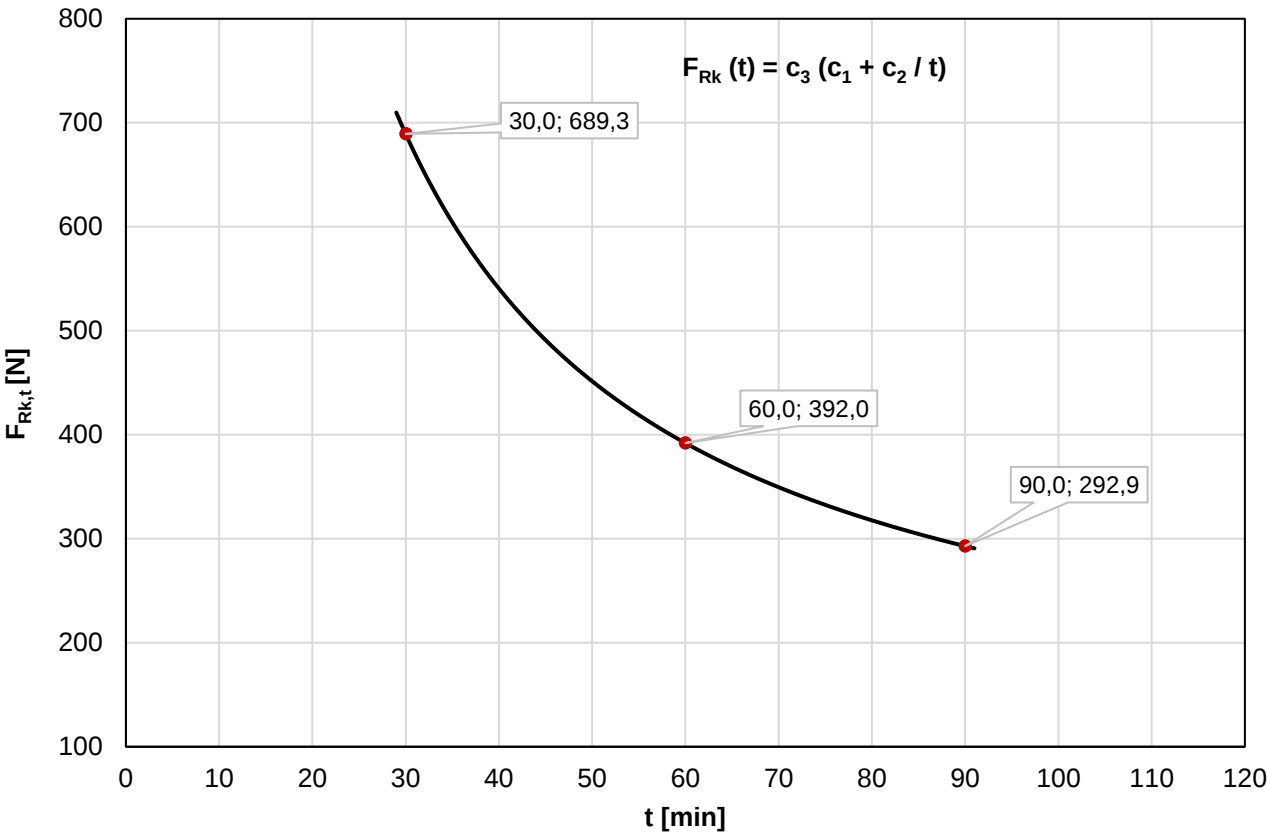
$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]
 $F_{Rk}(t)$ Resistance time function in case of fire [N]

Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 62-67 – MP-U-I 90-96 and MP-U 67-72 – MP-U 95-101

Annex D13

Figure D7: Regression curve according to Table D7



Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 62-67 – MP-U-I 90-96 and MP-U 67-72 – MP-U 95-101

Annex D14

Table D8: Resistance $F_{Rk,t}$ of ultimate pipe rings MP-U-I 62-67 – MP-U-I 90-96 and MP-U 67-72 – MP-U 95-101 in case of fire after $t = 30, 60$ and 90 minutes

Item number	Designation	Parameter of regression curve	$F_{Rk,t}$ [N]		
		$F_{Rk}(t) = c_3 (c_1 + c_2 / t)$	$F_{Rk,30}$	$F_{Rk,60}$	$F_{Rk,90}$
2242320	MP-U-I 62-67 M8/10/O16	$c_1 = 102,2415$ $c_2 = 15395,9909$ $c_3 = 0,92677$ $29 \text{ min} \leq t \leq 91 \text{ min}$	570,4	332,6	253,3
2242321	MP-U-I 67-72 M8/10/O16				
2242322	MP-U-I 72-77 2 ½" M8/10/O16				
2242323	MP-U-I 78-84 M8/10/O16				
2242324	MP-U-I 84-90 3" M8/10/O16				
2242325	MP-U-I 90-96 M8/10/O16				
2242295	MP-U-I 62-67 M8/10/½"				
2242296	MP-U-I 67-72 M8/10/½"				
2242297	MP-U-I 72-77 2 ½" M8/10/½"				
2242298	MP-U-I 78-84 M8/10/½"				
2242299	MP-U-I 84-90 3" M8/10/½"				
2242300	MP-U-I 90-96 M8/10/½"				
2242371	MP-U 67-72 M8/10/½"				
2242372	MP-U 72-77 2 ½" M8/10/½"				
2242373	MP-U 77-82 M8/10/½"				
2242374	MP-U 83-89 3" M8/10/½"				
2242375	MP-U 89-95 M8/10/½"				
2242376	MP-U 95-101 M8/10/½"				

Designation

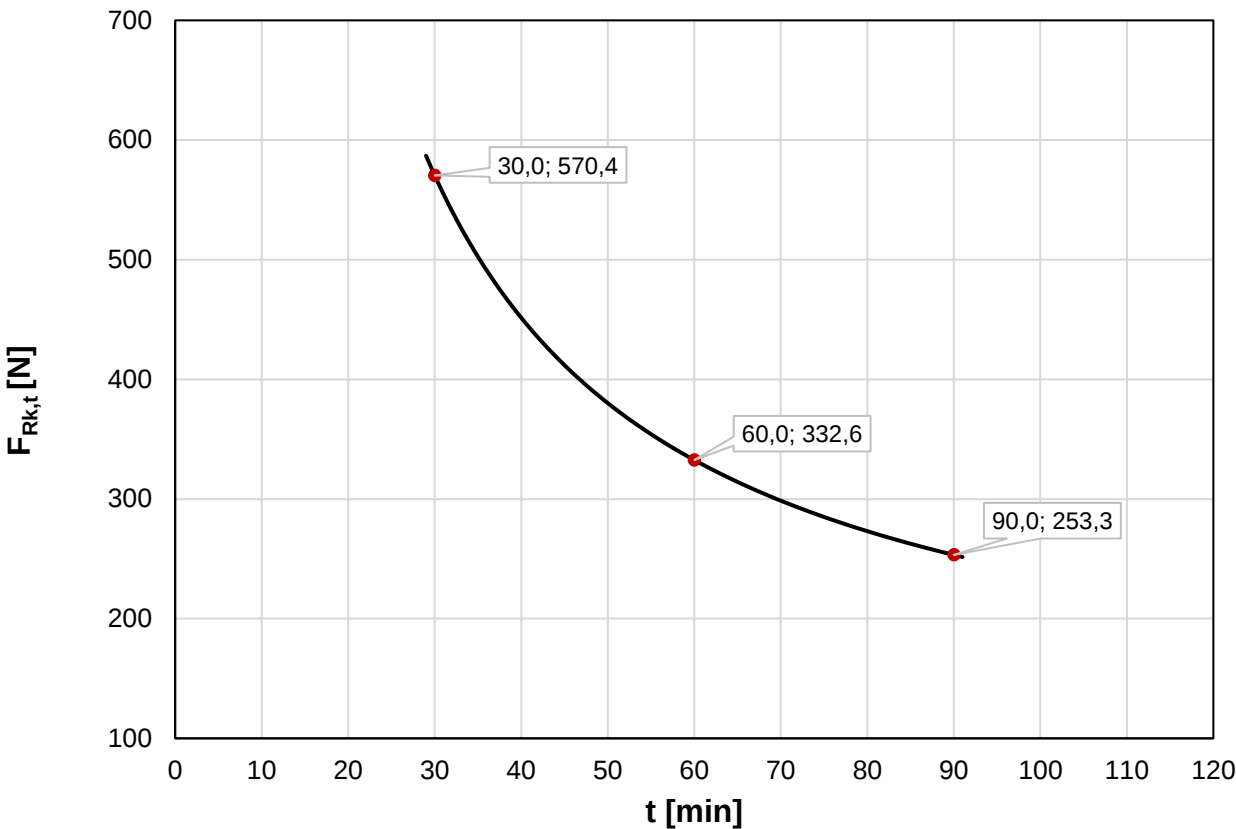
$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]
 $F_{Rk}(t)$ Resistance time function in case of fire [N]

Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 62-67 – MP-U-I 90-96 and MP-U 67-72 – MP-U 95-101

Annex D15

Figure D8: Regression curve according to Table D8



Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 62-67 – MP-U-I 90-96 and MP-U 67-72 – MP-U 95-101

Annex D16

Table D9: Load displacement function and deformations of ultimate pipe rings
MP-U-I 62-67 – MP-U-I 90-96 and MP-U 67-72 – MP-U 95-101 in case of fire

Item number	Designation	Parameter of regression curve	$F_{Rk,30}(\delta)$ [N]				$\delta_{max,t}$ [mm]	
		$F_{Rk,30}(\delta) = a_3(a_1 + \delta^{a_2})$	$F_{Rk,30}(16)$	$F_{Rk,30}(20)$	$F_{Rk,30}(24)$	$F_{Rk,30}(28)$	$\delta_{max,60}$	$\delta_{max,90}$
2242270	MP-U-I 62-67 M8/10	$a_1 = 5,1603$ $a_2 = 1,4856$ $a_3 = 0,903$ $15 \text{ mm} \leq \delta \leq 29 \text{ mm}$	286,6	399,2	523,5	658,2	32,9	32,9
2242271	MP-U-I 67-72 M8/10							
2242272	MP-U-I 72-77 2 ½" M8/10							
2242273	MP-U-I 78-84 M8/10							
2242274	MP-U-I 84-90 3" M8/10							
2242275	MP-U-I 90-96 M8/10							
2242346	MP-U 67-72 M8/10							
2242347	MP-U 72-77 2 ½" M8/10							
2242348	MP-U 77-82 M8/10							
2242349	MP-U 83-89 3" M8/10							
2242350	MP-U 89-95 M8/10							
2242351	MP-U 95-101 M8/10							
2242320	MP-U-I 62-67 M8/10/O16							
2242321	MP-U-I 67-72 M8/10/O16							
2242322	MP-U-I 72-77 2 ½" M8/10/O16							
2242323	MP-U-I 78-84 M8/10/O16							
2242324	MP-U-I 84-90 3" M8/10/O16							
2242325	MP-U-I 90-96 M8/10/O16							
2242295	MP-U-I 62-67 M8/10/½"							
2242296	MP-U-I 67-72 M8/10/½"							
2242297	MP-U-I 72-77 2 ½" M8/10/½"							
2242298	MP-U-I 78-84 M8/10/½"							
2242299	MP-U-I 84-90 3" M8/10/½"							
2242300	MP-U-I 90-96 M8/10/½"							
2242371	MP-U 67-72 M8/10/½"							
2242372	MP-U 72-77 2 ½" M8/10/½"							
2242373	MP-U 77-82 M8/10/½"							
2242374	MP-U 83-89 3" M8/10/½"							
2242375	MP-U 89-95 M8/10/½"							
2242376	MP-U 95-101 M8/10/½"							

Symbols and designation

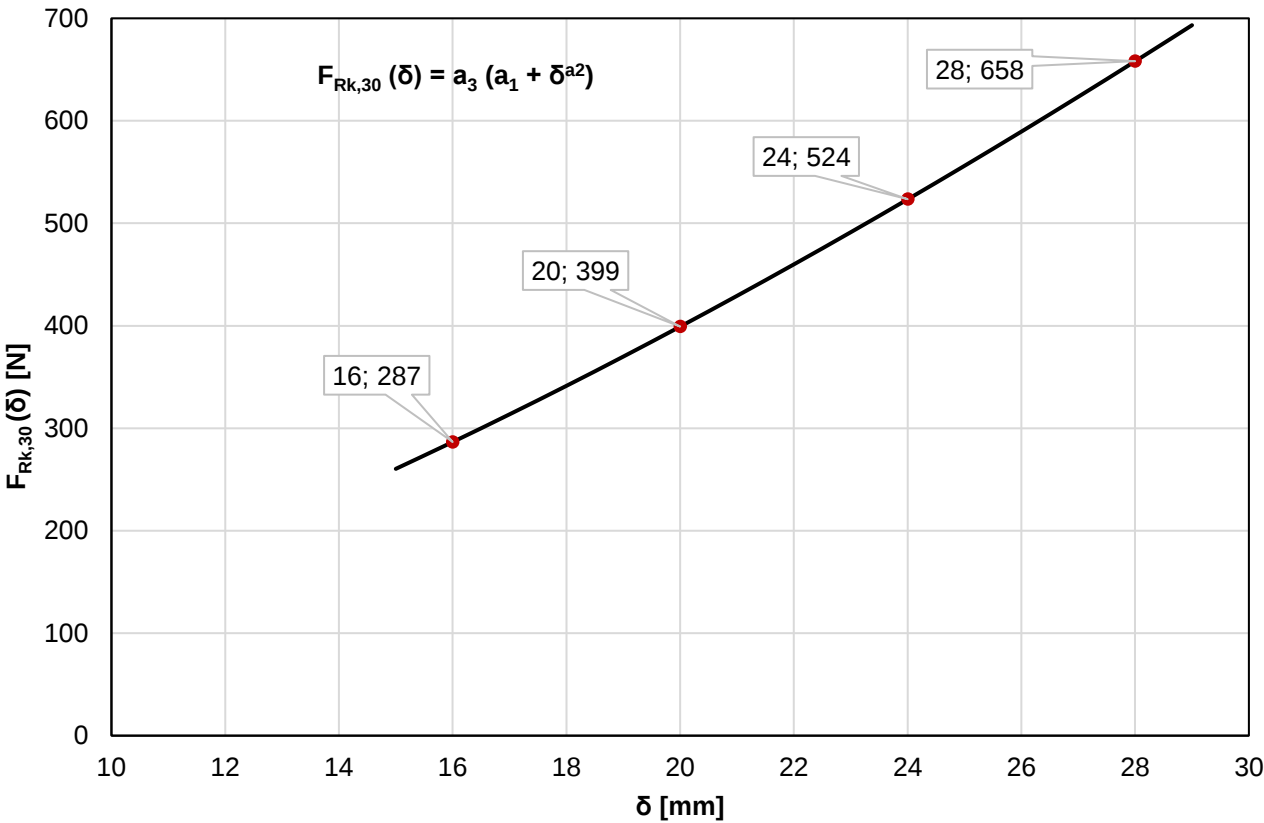
δ	Deformation
$\delta_{max,t}$	Maximum deformation after an exposure time $\leq t$ minutes in case of fire
$F_{Rk,30}(\delta)$	Load displacement function for an exposure time $t = 30$ minutes in case of fire

Hilti ultimate pipe clamps MP-U-I and MP-U

Load displacement function and deformations in case of fire of ultimate pipe rings MP-U-I 62-67 – MP-U-I 90-96 and MP-U 67-72 – MP-U 95-101

Annex D17

Figure D9: Regression curve according to Table D9



Hilti ultimate pipe clamps MP-U-I and MP-U

Load displacement function and deformations in case of fire of ultimate pipe rings MP-U-I 62-67 – MP-U-I 90-96 and MP-U 67-72 – MP-U 95-101

Annex D18

Table D10: Resistance $F_{Rk,t}$ of ultimate pipe rings MP-U-I 97-103 – MP-U-I 135-141 and MP-U 102-108 – MP-U 141-147 in case of fire after $t = 30, 60$ and 90 minutes

Item number	Designation	Parameter of regression curve	$F_{Rk,t}$ [N]		
		$F_{Rk}(t) = c_3 (c_1 + c_2 / t)$	$F_{Rk,30}$	$F_{Rk,60}$	$F_{Rk,90}$
2242276	MP-U-I 97-103 M8/10	$c_1 = 93,8086$ $c_2 = 28582,3739$ $c_3 = 0,871219$ $27 \text{ min} \leq t \leq 98 \text{ min}$	911,8	496,8	358,4
2242277	MP-U-I 103-109 M8/10				
2242278	MP-U-I 109-115 4" M8/10				
2242279	MP-U-I 115-121 M8/10				
2242280	MP-U-I 122-128 M8/10				
2242281	MP-U-I 129-135 M8/10				
2305365	MP-U-I 135-141 5" M8/10				
2242352	MP-U 102-108 M8/10				
2242353	MP-U 109-115 4" M8/10				
2242354	MP-U 115-121 M8/10				
2242355	MP-U 121-127 M8/10				
2242356	MP-U 128-134 M8/10				
2242357	MP-U 135-141 5" M8/10				
2305351	MP-U 141-147 M8/10				

Designation

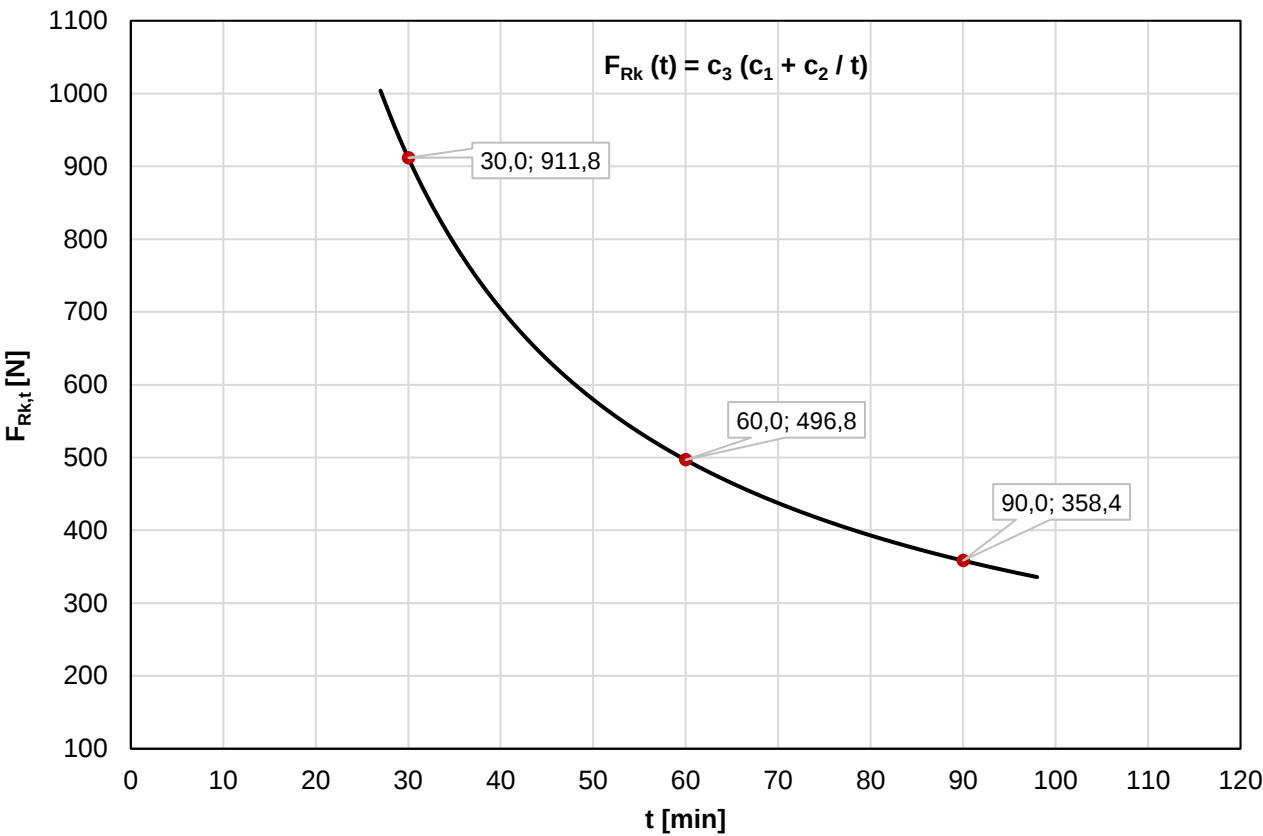
$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]
 $F_{Rk}(t)$ Resistance time function in case of fire [N]

Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 97-103 – MP-U-I 135-141 and MP-U 102-108 – MP-U 141-147

Annex D19

Figure D10: Regression curve according to Table D10



Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
 MP-U-I 97-103 – MP-U-I 135-141 and MP-U 102-108 – MP-U 141-147

Annex D20

Table D11: Resistance $F_{Rk,t}$ of ultimate pipe rings MP-U-I 97-103 – MP-U-I 135-141 and MP-U 102-108 – MP-U 141-147 in case of fire after $t = 30, 60$ and 90 minutes

Item number	Designation	Parameter of regression curve	$F_{Rk,t}$ [N]		
		$F_{Rk}(t) = c_3 (c_1 + c_2 / t)$	$F_{Rk,30}$	$F_{Rk,60}$	$F_{Rk,90}$
2242326	MP-U-I 97-103 M8/10/O16	$c_1 = 93,8086$ $c_2 = 22866,1849$ $c_3 = 0,871219$ $27 \text{ min} \leq t \leq 98 \text{ min}$	745,8	413,7	303,1
2242327	MP-U-I 103-109 M8/10/O16				
2242328	MP-U-I 109-115 4" M8/10/O16				
2242329	MP-U-I 115-121 M8/10/O16				
2242330	MP-U-I 122-128 M8/10/O16				
2242331	MP-U-I 129-135 M8/10/O16				
2305377	MP-U-I 135-141 5" M8/10/O16				
2242301	MP-U-I 97-103 M8/10/½"				
2242302	MP-U-I 103-109 M8/10/½"				
2242303	MP-U-I 109-115 4" M8/10/½"				
2242304	MP-U-I 115-121 M8/10/½"				
2242305	MP-U-I 122-128 M8/10/½"				
2242306	MP-U-I 129-135 M8/10/½"				
2305371	MP-U-I 135-141 5" M8/10/½"				
2242377	MP-U 102-108 M8/10/½"				
2242378	MP-U 109-115 4" M8/10/½"				
2242379	MP-U 115-121 M8/10/½"				
2242380	MP-U 121-127 M8/10/½"				
2242235	MP-U 128-134 M8/10/½"				
2242332	MP-U 135-141 5" M8/10/½"				
2305357	MP-U 141-147 M8/10/½"				

Designation

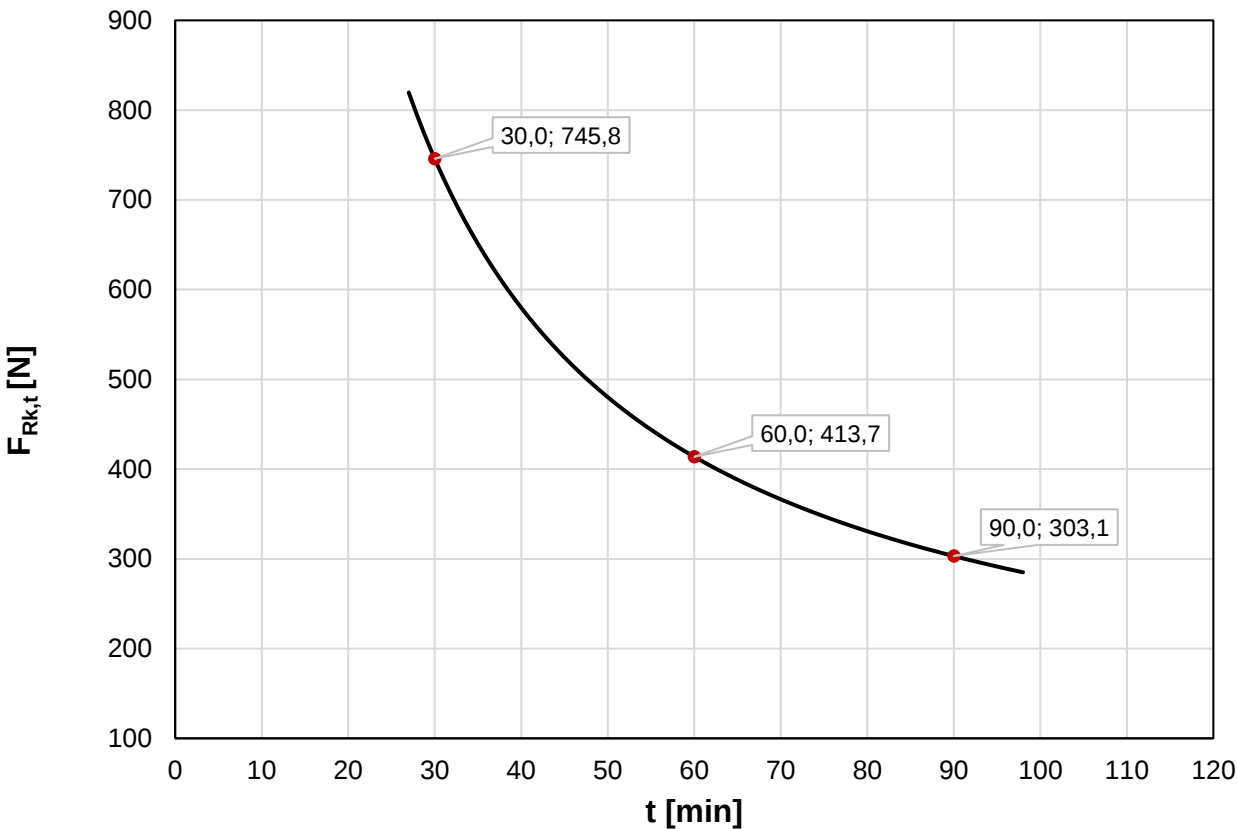
$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]
 $F_{Rk}(t)$ Resistance time function in case of fire [N]

Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 97-103 – MP-U-I 135-141 and MP-U 102-108 – MP-U 141-147

Annex D21

Figure D11: Regression curve according to Table D11



Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
 MP-U-I 97-103 – MP-U-I 135-141 and MP-U 102-108 – MP-U 141-147

Annex D22

Table D12: Load displacement function and deformations of ultimate pipe rings
MP-U-I 97-103 – MP-U-I 135-141 and MP-U 102-108 – MP-U 141-147 in case of fire

Item number	Designation	Parameter of regression curve	$F_{Rk,30}(\delta)$ [N]				$\delta_{max,t}$ [mm]	
		$F_{Rk,30}(\delta) = a_3(a_1 + \delta^{a_2})$	$F_{Rk,30}(20)$	$F_{Rk,30}(24)$	$F_{Rk,30}(28)$	$F_{Rk,30}(30)$	$\delta_{max,60}$	$\delta_{max,90}$
2242276	MP-U-I 97-103 M8/10	$a_1 = 3,1095$ $a_2 = 1,6655$ $a_3 = 0,8348$ $19 \text{ mm} \leq \delta \leq 32 \text{ mm}$	381,2	516,4	667,5	748,8	41,5	52,7
2242277	MP-U-I 103-109 M8/10							
2242278	MP-U-I 109-115 4" M8/10							
2242279	MP-U-I 115-121 M8/10							
2242280	MP-U-I 122-128 M8/10							
2242281	MP-U-I 129-135 M8/10							
2305365	MP-U-I 135-141 5" M8/10							
2242352	MP-U 102-108 M8/10							
2242353	MP-U 109-115 4" M8/10							
2242354	MP-U 115-121 M8/10							
2242355	MP-U 121-127 M8/10							
2242356	MP-U 128-134 M8/10							
2242357	MP-U 135-141 5" M8/10							
2305351	MP-U 141-147 M8/10							
2242326	MP-U-I 97-103 M8/10/O16							
2242327	MP-U-I 103-109 M8/10/O16							
2242328	MP-U-I 109-115 4" M8/10/O16							
2242329	MP-U-I 115-121 M8/10/O16							
2242330	MP-U-I 122-128 M8/10/O16							
2242331	MP-U-I 129-135 M8/10/O16							
2305377	MP-U-I 135-141 5" M8/10/O16							
2242301	MP-U-I 97-103 M8/10/1/2"							
2242302	MP-U-I 103-109 M8/10/1/2"							
2242303	MP-U-I 109-115 4" M8/10/1/2"							
2242304	MP-U-I 115-121 M8/10/1/2"							
2242305	MP-U-I 122-128 M8/10/1/2"							
2242306	MP-U-I 129-135 M8/10/1/2"							
2305371	MP-U-I 135-141 5" M8/10/1/2"							
2242377	MP-U 102-108 M8/10/1/2"							
2242378	MP-U 109-115 4" M8/10/1/2"							
2242379	MP-U 115-121 M8/10/1/2"							
2242380	MP-U 121-127 M8/10/1/2"							
2242235	MP-U 128-134 M8/10/1/2"							
2242332	MP-U 135-141 5" M8/10/1/2"							
2305357	MP-U 141-147 M8/10/1/2"							

Designation

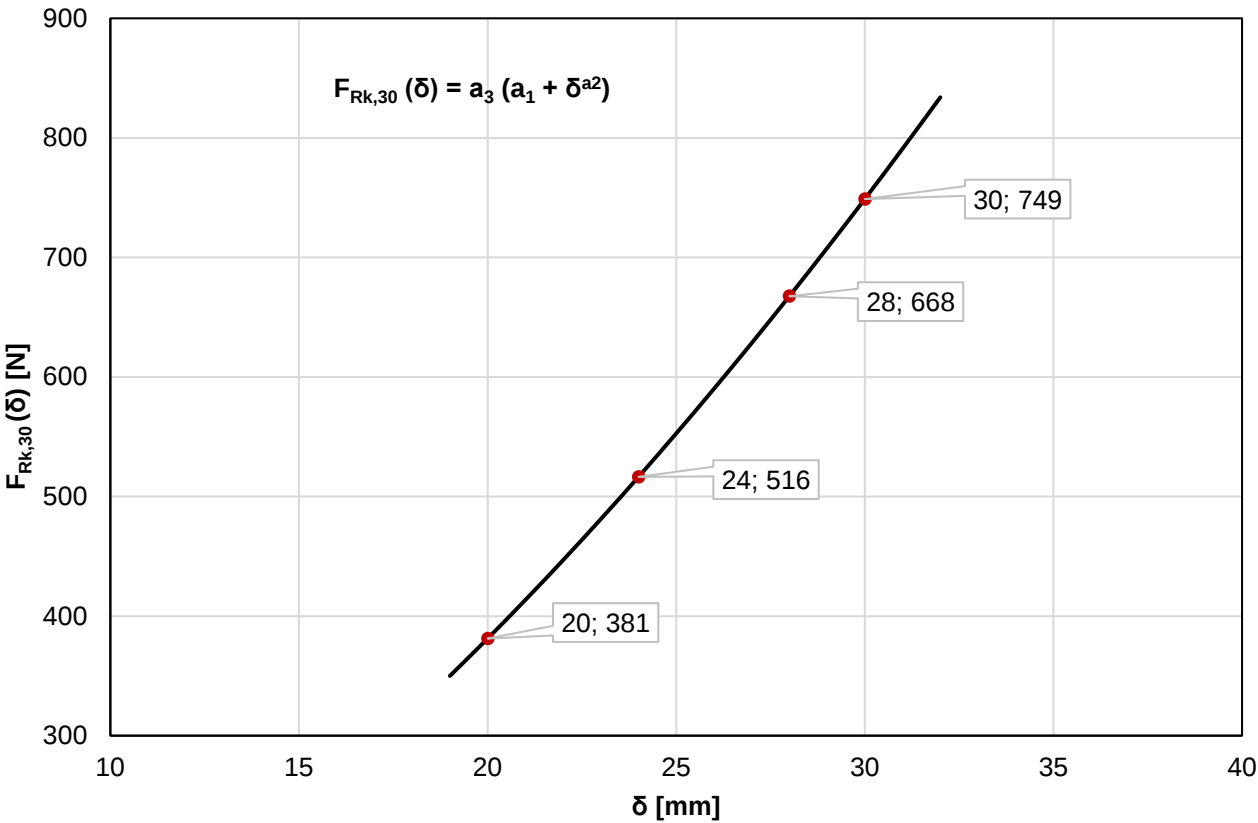
- δ Deformation
 $\delta_{max,t}$ Maximum deformation after an exposure time $\leq t$ minutes in case of fire
 $F_{Rk,30}(\delta)$ Load displacement function for an exposure time $t = 30$ minutes in case of fire

Hilti ultimate pipe clamps MP-U-I and MP-U

Load displacement function and deformations in case of fire of ultimate pipe rings MP-U-I 97-103 – MP-U-I 135-141 and MP-U 102-108 – MP-U 141-147

Annex D23

Figure D12: Regression curve according to Table D12



Hilti ultimate pipe clamps MP-U-I and MP-U

Load displacement function and deformations in case of fire of ultimate pipe rings MP-U-I 97-103 – MP-U-I 135-141 and MP-U 102-108 – MP-U 141-147

Annex D24

Table D13: Resistance $F_{Rk,t}$ of ultimate pipe rings MP-U-I 141-147 – MP-U-I 165-170 and MP-U 147-153 – MP-U 170-176 in case of fire after $t = 30, 60$ and 90 minutes

Item number	Designation	Parameter of regression curve	$F_{Rk,t}$ [N]		
		$F_{Rk}(t) = c_3 (c_1 + c_2 / t)$	$F_{Rk,30}$	$F_{Rk,60}$	$F_{Rk,90}$
2305366	MP-U-I 141-147 M8/10	$c_1 = 150,3069$ $c_2 = 29298,0467$ $c_3 = 0,881442$ $27 \text{ min} \leq t \leq 112 \text{ min}$	993,3	562,9	419,4
2305367	MP-U-I 147-153 M8/10				
2305368	MP-U-I 154-160 M8/10				
2305369	MP-U-I 160-166 6" M8/10				
2305370	MP-U-I 164-170 M8/10				
2305352	MP-U 147-153 M8/10				
2305353	MP-U 153-159 M8/10				
2305354	MP-U 160-166 6" M8/10				
2305355	MP-U 166-172 M8/10				
2305356	MP-U 170-176 M8/10				

Designation

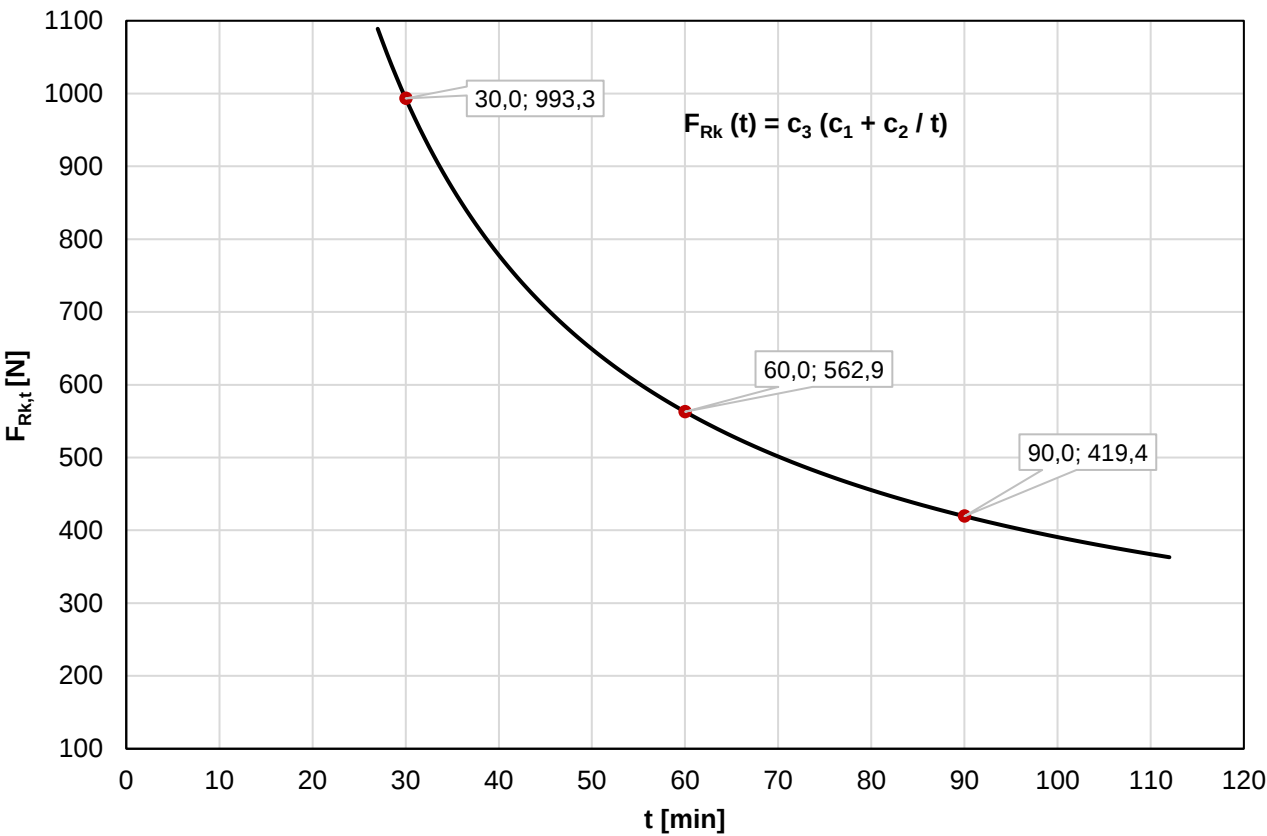
$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]
 $F_{Rk}(t)$ Resistance time function in case of fire [N]

Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 141-147 – MP-U-I 165-170 and MP-U 147-153 – MP-U 170-176

Annex D25

Figure D13: Regression curve according to Table D13



Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
 MP-U-I 141-147 – MP-U-I 165-170 and MP-U 147-153 – MP-U 170-176

Annex D26

Table D14: Resistance $F_{Rk,t}$ of ultimate pipe rings MP-U-I 141-147 – MP-U-I 165-170 and MP-U 147-153 – MP-U 170-176 in case of fire after $t = 30, 60$ and 90 minutes

Item number	Designation	Parameter of regression curve	$F_{Rk,t}$ [N]		
		$F_{Rk}(t) = c_3 (c_1 + c_2 / t)$	$F_{Rk,30}$	$F_{Rk,60}$	$F_{Rk,90}$
2305378	MP-U-I 141-147 M8/10/O16	$c_1 = 150,3069$ $c_2 = 23435,1849$ $c_3 = 0,881442$ $27 \text{ min} \leq t \leq 112 \text{ min}$	821,1	476,8	362,0
2305379	MP-U-I 147-153 M8/10/O16				
2305380	MP-U-I 154-160 M8/10/O16				
2305381	MP-U-I 160-166 6" M8/10/O16				
2305382	MP-U-I 164-170 M8/10/O16				
2305372	MP-U-I 141-147 M8/10/1/2"				
2305373	MP-U-I 147-153 M8/10/1/2"				
2305374	MP-U-I 154-160 M8/10/1/2"				
2305375	MP-U-I 160-166 6" M8/10/1/2"				
2305376	MP-U-I 164-170 M8/10/1/2"				
2305358	MP-U 147-153 M8/10/1/2"				
2305359	MP-U 153-159 M8/10/1/2"				
2305360	MP-U 160-166 6" M8/10/1/2"				
2305361	MP-U 166-172 M8/10/1/2"				
2305362	MP-U 170-176 M8/10/1/2"				

Designation

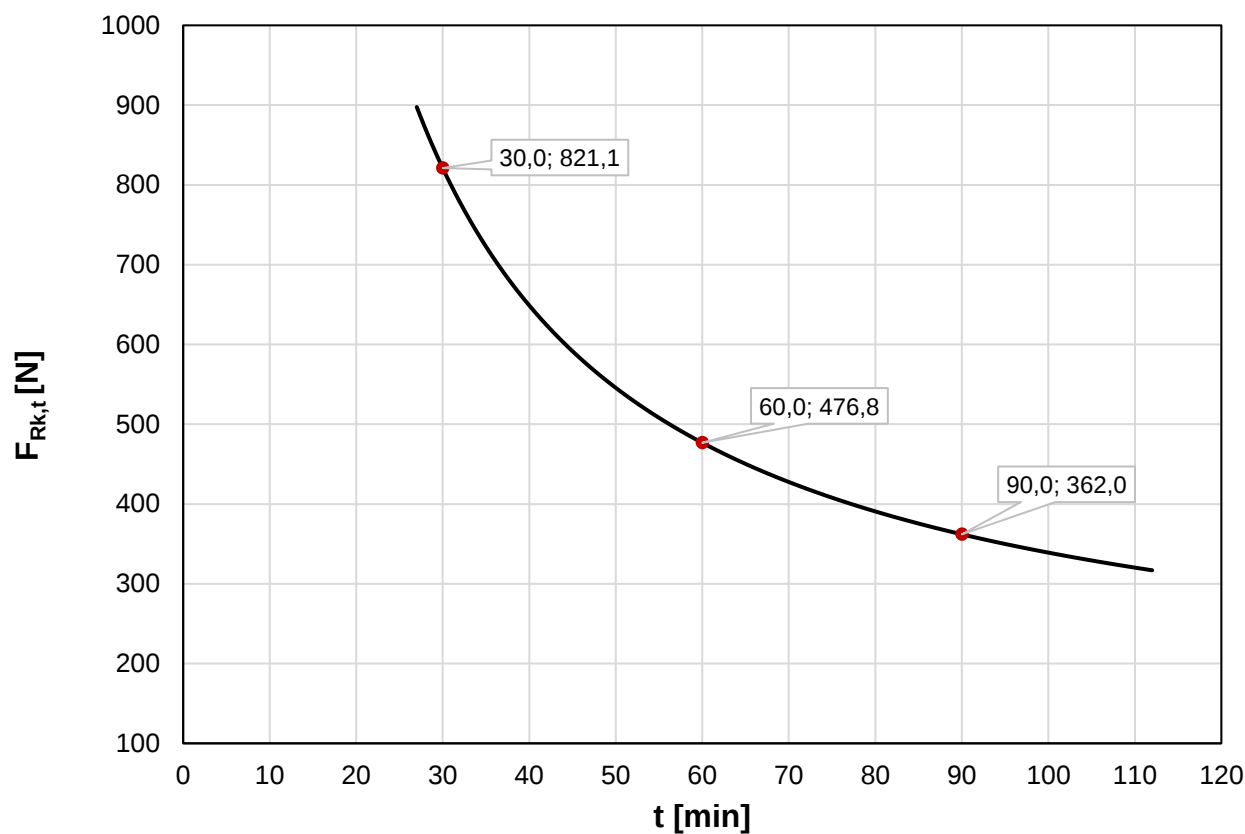
$F_{Rk,t}$ Resistance after an exposure time t in case of fire [N]
 $F_{Rk}(t)$ Resistance time function in case of fire [N]

Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 141-147 – MP-U-I 165-170 and MP-U 147-153 – MP-U 170-176

Annex D27

Figure D14: Regression curve according to Table D14



Hilti ultimate pipe clamps MP-U-I and MP-U

Resistance in case of fire of ultimate pipe rings
MP-U-I 141-147 – MP-U-I 165-170 and MP-U 147-153 – MP-U 170-176

Annex D28

Table D15: Load displacement function and deformations of ultimate pipe rings
MP-U-I 141-147 – MP-U-I 165-170 and MP-U 147-153 – MP-U 170-176 in case of fire

Item number	Designation	Parameter of regression curve	$F_{Rk,30}(\delta)$ [N]				$\delta_{max,t}$ [mm]	
		$F_{Rk,30}(\delta) = a_3(a_1 + \delta^{a_2})$	$F_{Rk,30}(20)$	$F_{Rk,30}(30)$	$F_{Rk,30}(40)$	$F_{Rk,30}(50)$	$\delta_{max,60}$	$\delta_{max,90}$
2305366	MP-U-I 141-147 M8/10	$a_1 = 10,3048$ $a_2 = 1,2434$ $a_3 = 0,7472$ $19 \text{ mm} \leq \delta \leq 50 \text{ mm}$	319,3	528,5	755,8	997,5	56,4	61,1
2305367	MP-U-I 147-153 M8/10							
2305368	MP-U-I 154-160 M8/10							
2305369	MP-U-I 160-166 6" M8/10							
2305370	MP-U-I 164-170 M8/10							
2305352	MP-U 147-153 M8/10							
2305353	MP-U 153-159 M8/10							
2305354	MP-U 160-166 6" M8/10							
2305355	MP-U 166-172 M8/10							
2305356	MP-U 170-176 M8/10							
2305378	MP-U-I 141-147 M8/10/O16							
2305379	MP-U-I 147-153 M8/10/O16							
2305380	MP-U-I 154-160 M8/10/O16							
2305381	MP-U-I 160-166 6" M8/10/O16							
2305382	MP-U-I 164-170 M8/10/O16							
2305372	MP-U-I 141-147 M8/10/½"							
2305373	MP-U-I 147-153 M8/10/½"							
2305374	MP-U-I 154-160 M8/10/½"							
2305375	MP-U-I 160-166 6" M8/10/½"							
2305376	MP-U-I 164-170 M8/10/½"							
2305358	MP-U 147-153 M8/10/½"							
2305359	MP-U 153-159 M8/10/½"							
2305360	MP-U 160-166 6" M8/10/½"							
2305361	MP-U 166-172 M8/10/½"							
2305362	MP-U 170-176 M8/10/½"							

Designation

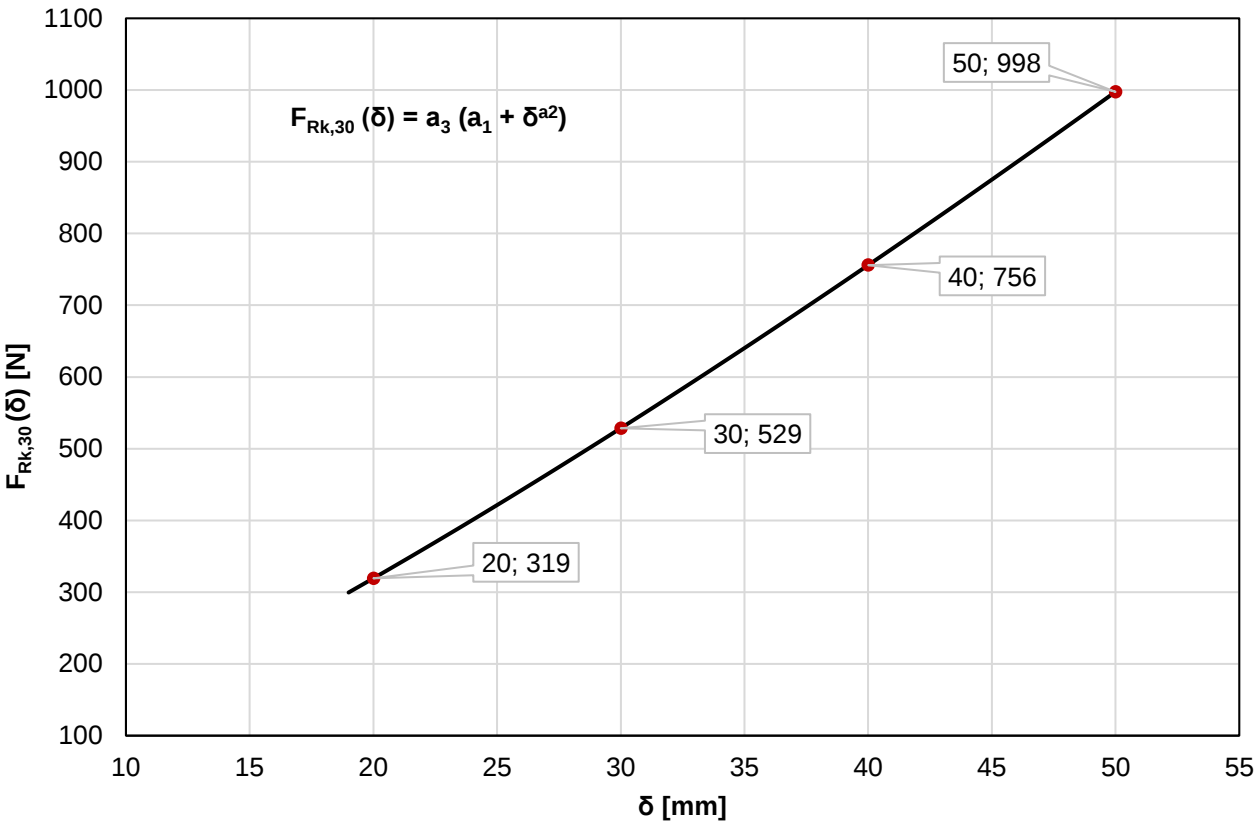
- δ Deformation
 $\delta_{max,t}$ Maximum deformation after an exposure time $\leq t$ minutes in case of fire
 $F_{Rk,30}(\delta)$ Load displacement function for an exposure time $t = 30$ minutes in case of fire

Hilti ultimate pipe clamps MP-U-I and MP-U

Load displacement function and deformations in case of fire of ultimate pipe rings MP-U-I 141-147 – MP-U-I 165-170 and MP-U 147-153 – MP-U 170-176

Annex D29

Figure D15: Regression curve according to Table D15

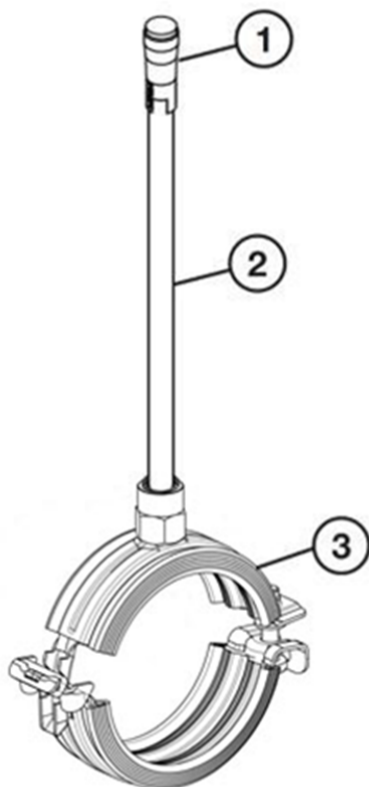


Hilti ultimate pipe clamps MP-U-I and MP-U

Load displacement function and deformations in case of fire of ultimate pipe rings MP-U-I 141-147 – MP-U-I 165-170 and MP-U 147-153 – MP-U 170-176

Annex D30

Figure E1: Bill of material and instructions for use



Bill of material					
Part of typical		Ref.	Opt.	Item No.	Description
Setup	Fixation	1	A	376967	HKD M10x40 drop-in anchor
		2	A*	339793 339794 216415	AM8x1000 4.8 threaded rod AM8x2000 4.8 threaded rod AM8x3000 4.8 threaded rod
		2	B**	339795 216422 56428	AM10x1000 4.8 threaded rod AM16x2000 4.8 threaded rod GR-G ½"x2000 4.6 threaded rod
Pipe clamp	M8	3	A*	2242237 - 2242239 2242250 - 2242256 2305363 - 2305364	MP-U M8
Pipe clamp	M8/10 M8/10/O16 M8/10/1/2"	3	A B C D E	2242258 - 2305376***	MP-U M8/10 MP-U M8/1/2" MP-U-I M8/10 MP-U-I M8/10/O16 MP-U-I M8/10/1/2"
Pipe clamp	M8/10	3	A*	2275028 - 2275041	MP-U-G M8/10

* Only for use under ambient temperature

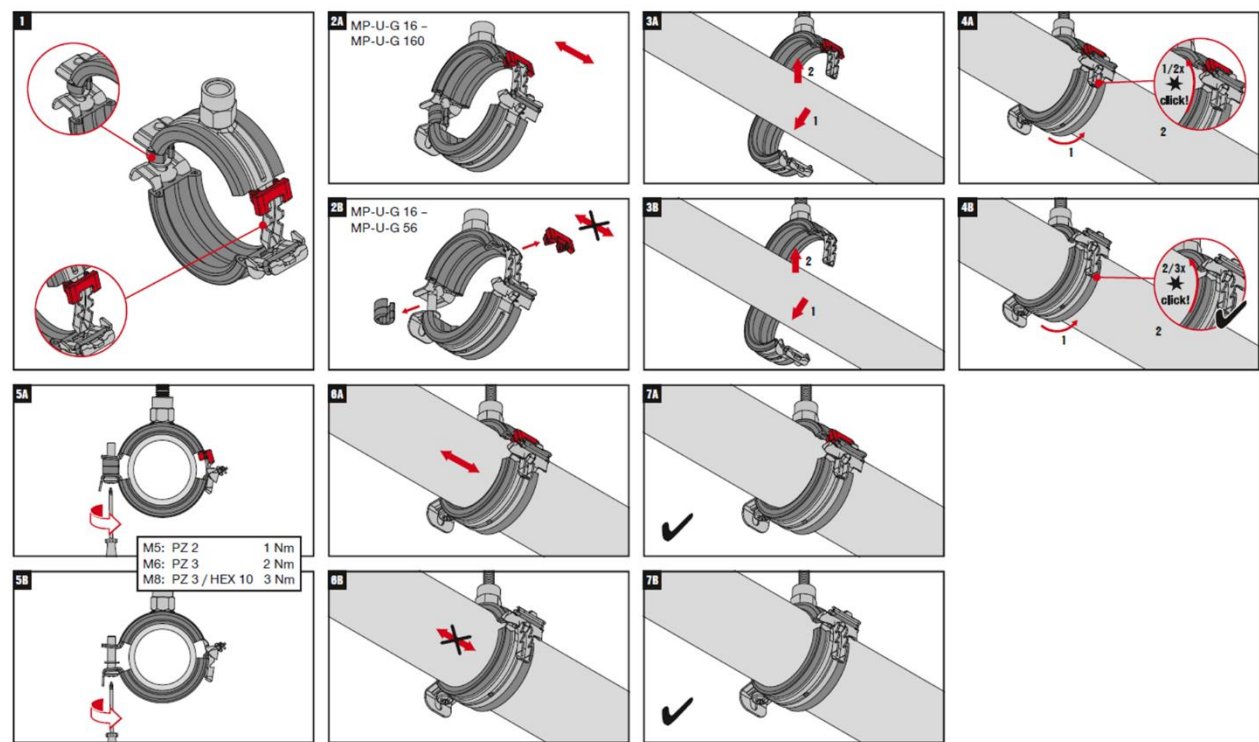
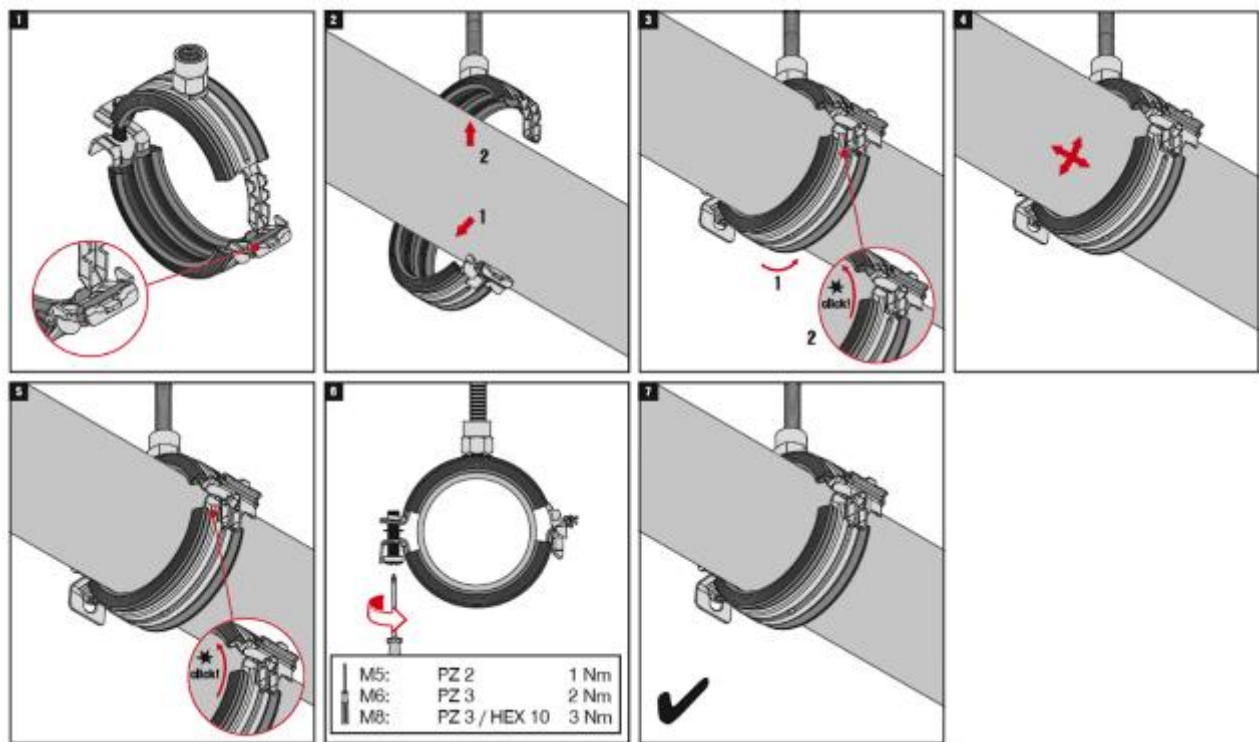
** In case of fire

*** Excluding item no. 2275020 to 2274899

Hilti ultimate pipe clamps MP-U-I and MP-U

General assembly instructions

Annex E1
(informative)



Hilti ultimate pipe clamps MP-U-I and MP-U

General assembly instructions

Annex E2
(informative)