1

# Hilti HVU Adhesive Capsule with HAS-E/ER/EF/HCR and HIS-N/RN




## Customer Hotline

**Hong Kong** 8228 8118

**Macau** (Toll free) 00800- 8228 8118

## SAMPLE SUBMISSION AND APPROVAL FORM

| | | | |
|---|---|---|---|
| Contract Title: | _____ | Ref. No.: | _____ |
| | _____ | Date: | _____ |
| | | Ref. No. of Previous Submission: | _____ |
| Contract No: | _____ | (1) | _____ |
| File Reference: | _____ | (2) | _____ |

## DETAILS OF SUBMISSION

To: Contract Manager's Representative Attention: _____

From: _____

The enclosed sample and catalogue* / certificate of origin* / technical data* / test report* / job reference* as described below have been checked for compliance with the Specifications and Drawings, and are submitted for approval.

**1. General Information**

a. Material Description: HVU Adhesive Capsule

b. Location: _____

c. Specification Ref. Page: _____ Item: _____

d. Drawing Ref. No. _____

e. B.Q. Ref.No.: _____

f. Anticipated date of approval: _____

**2. Technical Information**

The submitted sample has been checked against the specification and drawings as listed below:-

| **Specification Requirements** | **Submitted Sample** (State details against each item) |
|---|---|
| a. **Brand**<br>Not specified | Hilti |
| b. **Country of Origin**<br>Not specified | Germany |
| c. **Manufacturer's Name & Address**<br>Not specified | Hilti Corporation, FL-9494 Principality of Liechtenstein. |
| d. **Factory's Name & Address(es)**<br>Not specified | Hilti Gmbh Ind. Ges. F. Befestigungstechnik<br>Hiltistrasse 6, D-86916 Kaufering, Germany. |
| e. **Supplier (with Applicator, if any)**<br>Not specified | Hilti (Hong Kong) Ltd |

| | |
|---|---|
| f. **Appearance**<br>Not specified | According to the sample submitted |
| g. **Color +**<br>Not specified | Nil |
| h. **Specification**<br>Not specified | Attached |
| i. **Manufacturer's Catalogue**<br>Not specified | Attached |
| j. **Test Report** (Original/Certificated True Copy)<br>Not specified | Attached |
| k. **Previous Job Reference**<br>Not specified | Attached |
| l. **Supplementary Information**<br>Not specified | NIL |

For and on behalf of the Contractor

_____
(Quality Control Manager)

**CONTRACT MANAGER'S COMMENTS**

To:
From: Contract Manager's Representative: _____

On the basis of the sample and information given, the above sample submitted is:

(1) * **Approved.**
(2) * **Not approved** because _____
_____
_____

Remarks: _____
_____
_____

Approval does not alter the requirements of the Contract

Contract Manager's Representative: _____

_____
Date:

cc. _____
_____
_____
_____

(* Delete if appropriate)
(+ For glass or vitreous mosaic tiles, the contractor is required to confirm the colour range(s) of the submitted sample, i.e. a) light and or medium; or b) dark)

## SAMPLE SUBMISSION AND APPROVAL FORM

| | | | |
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**1. General Information**

a. Material Description: HAS-E/ER/EF Anchor Rod or HIS-N/RN (M8-M24) Anchor Sleeve

b. Location: _____

c. Specification Ref. Page: _____ Item: _____

d. Drawing Ref. No. _____

e. B.Q. Ref.No.: _____

f. Anticipated date of approval: _____

**2. Technical Information**

The submitted sample has been checked against the specification and drawings as listed below:-

| **Specification Requirements** | **Submitted Sample** (State details against each item) |
|---|---|
| a. **Brand**<br>Not specified | Hilti |
| b. **Country of Origin**<br>Not specified | Republic of China |
| c. **Manufacturer's Name & Address**<br>Not specified | Hilti Corporation, FL-9494 Principality of Liechtenstein. |
| d. **Factory's Name & Address(es)**<br>Not specified | Hilti (China Zhangjiang) Co. Ltd., Yongping Road South, Zhangjiang Development Zone, 524022 Zhangjiang, Guangdong Province, China. |
| e. **Supplier (with Applicator, if any)** | |

| | |
|---|---|
| Not specified | Hilti (Hong Kong) Ltd |
| f. **Appearance**<br>Not specified | According to the sample submitted |
| g. **Color +**<br>Not specified | Nil |
| h. **Specification**<br>Not specified | Attached |
| i. **Manufacturer's Catalogue**<br>Not specified | Attached |
| j. **Test Report** (Original/Certificated True Copy)<br>Not specified | Attached |
| k. **Previous Job Reference**<br>Not specified | Attached |
| l. **Supplementary Information**<br>Not specified | NIL |

For and on behalf of the Contractor

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(Quality Control Manager)

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_____
_____
Remarks: _____
_____
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Approval does not alter the requirements of the Contract

Contract Manager's Representative: _____

_____
Date:

cc. _____
_____
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(* Delete if appropriate)
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## SAMPLE SUBMISSION AND APPROVAL FORM

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| Contract Title: | _____ | Ref. No.: | _____ |
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| File Reference: | _____ | (2) | _____ |

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To: Contract Manager's Representative Attention: _____

From: _____

The enclosed sample and catalogue* / certificate of origin* / technical data* / test report* / job reference* as described below have been checked for compliance with the Specifications and Drawings, and are submitted for approval.

**1. General Information**

a. Material Description: HAS-E/ER/EF (M27-M39) Anchor Rod

b. Location: _____

c. Specification Ref. Page: _____ Item: _____

d. Drawing Ref. No. _____

e. B.Q. Ref.No.: _____

f. Anticipated date of approval: _____

**2. Technical Information**

The submitted sample has been checked against the specification and drawings as listed below:-

| **Specification Requirements** | **Submitted Sample** (State details against each item) |
|---|---|
| a. **Brand** Not specified | Hilti |
| b. **Country of Origin** Not specified | Hungary |
| c. **Manufacturer's Name & Address** Not specified | Hilti Corporation, FL-9494 Principality of Liechtenstein. |
| d. **Factory's Name & Address(es)** Not specified | Hilti Werkzeug Gmbh., Kecskemet / Szt. Istvan 17, Hungary. |
| e. **Supplier (with Applicator, if any)** Not specified | Hilti (Hong Kong) Ltd |

| | |
|---|---|
| f. **Appearance**<br>Not specified | According to the sample submitted |
| g. **Color +**<br>Not specified | Nil |
| h. **Specification**<br>Not specified | Attached |
| i. **Manufacturer's Catalogue**<br>Not specified | Attached |
| j. **Test Report** (Original/Certificated True Copy)<br>Not specified | Attached |
| k. **Previous Job Reference**<br>Not specified | Attached |
| l. **Supplementary Information**<br>Not specified | NIL |

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_____

Remarks: _____
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## SAMPLE SUBMISSION AND APPROVAL FORM

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The enclosed sample and catalogue* / certificate of origin* / technical data* / test report* / job reference* as described below have been checked for compliance with the Specifications and Drawings, and are submitted for approval.

**1. General Information**

a. Material Description: HAS-HCR Anchor Rod

b. Location: _____

c. Specification Ref. Page: _____ Item: _____

d. Drawing Ref. No. _____

e. B.Q. Ref.No.: _____

f. Anticipated date of approval: _____

**2. Technical Information**

The submitted sample has been checked against the specification and drawings as listed below:-

| **Specification Requirements** | **Submitted Sample** (State details against each item) |
|---|---|
| a. **Brand** Not specified | Hilti |
| b. **Country of Origin** Not specified | Germany |
| c. **Manufacturer's Name & Address** Not specified | Hilti Corporation, FL-9494 Principality of Liechtenstein. |
| d. **Factory's Name & Address(es)** Not specified | Hilti Gmbh. Ind. Ges. F. Befestigungstechnik, Hiltistrasse 6, D-86916 Kaufering, Germany. |
| e. **Supplier (with Applicator, if any)** Not specified | Hilti (Hong Kong) Ltd |

| | |
|---|---|
| f. **Appearance**<br>Not specified | According to the sample submitted |
| g. **Color +**<br>Not specified | Nil |
| h. **Specification**<br>Not specified | Attached |
| i. **Manufacturer's Catalogue**<br>Not specified | Attached |
| j. **Test Report** (Original/Certificated True Copy)<br>Not specified | Attached |
| k. **Previous Job Reference**<br>Not specified | Attached |
| l. **Supplementary Information**<br>Not specified | NIL |

For and on behalf of the Contractor

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(Quality Control Manager)

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Contract Manager's Representative: _____

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(+ For glass or vitreous mosaic tiles, the contractor is required to confirm the colour range(s) of the submitted sample, i.e. a) light and or medium; or b) dark)

# Adhesive capsule anchor system HVU

## Base materials

- Concrete (uncracked)

## Applications

- Anchoring structural steel connections (e.g. steel columns, beams, etc.)
- Anchors for road and tunnel applications (crash barriers, noise barriers and overhead catenary systems)

## Advantages

- Flexible foil capsule instead of glass: a robust product for tough jobsite conditions
- Tested according to standard temperature curve (ISO 834) and the German tunnel temperature curve (ZTV-ING, part 5)
- One system for all applications: a wide range of adhesive capsules, anchor rods, internally threaded sleeves in various diameters and lengths
- Anchors installed overhead don't drop out
- Pre-measured portions in foil, no waste
- Styrene-free and odourless

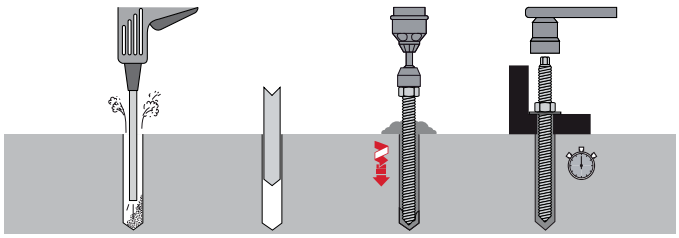
## Technical data

| | |
|---|---|
| **Material composition** | Hybrid urethane methacrylate adhesive |
| **Material, corrosion** | N/A |
| **Seismic** | No |
| **Fatigue** | No |
| **Fire** | Yes |


## Approvals

| | |
|---|---|
| ETA | ETA-05/0255 for HVU (ETAG 001-05, Option 7) |

Approvals and test reports may apply to selected products only. Please refer to the documents for details.



These are abbreviated instructions which may vary according to the application. Always observe/follow the instructions accompanying the product or refer to www.hilti.com/techlib.

| Ordering designation | Drill bit diameter | Standard embedment depth | Sales pack quantity | Item number |
|---|---|---|---|---|
| **HVU M8X80** | 10 mm | 80 mm | 10 pc | **256691** |
| **HVU M10X90** | 12 mm | 90 mm | 10 pc | **256692** |
| **HVU M12X110** | 14 mm | 110 mm | 10 pc | **256693** |
| **HVU M16X125** | 18 mm | 125 mm | 10 pc | **256694** |
| **HVU M20X170** | 24 mm | 170 mm | 5 pc | **256695** |
| **HVU M24X210** | 28 mm | 210 mm | 5 pc | **256696** |
| **HVU M27X240** | 30 mm | 240 mm | 4 pc | **256697**[1)] |
| **HVU M30X270** | 35 mm | 270 mm | 4 pc | **256698**[1)] |
| **HVU M33X300** | 37 mm | 300 mm | 4 pc | **256699**[1)] |
| **HVU M36X330** | 40 mm | 330 mm | 2 pc | **256700**[1)] |
| **HVU M39X360** | 42 mm | 360 mm | 2 pc | **256701**[1)] |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

## Anchor rod (5.8 carbon steel) HAS-E

### Approvals

| | |
|---|---|
| ETA | (ETAG 001-05, Option 7) |
| | ETA-05/0255 for HVU (ETAG 001-05, Option 7) |
| | ETA-09/0265 for HIT-HY70 concrete (ETAG 001-5, Option 7) |

Approvals and test reports may apply to selected products only. Please refer to the documents for details.

CE

### Technical data

| | |
|---|---|
| **Head configuration** | Externally threaded |
| **Material composition** | Steel, 5.8 grade, zinc-plated (min. 5 µm) |
| **Material, corrosion** | Steel, zinc-plated |
| **Anchor type** | Off-the-shelf rods |
| **Approvals / test reports** | ETA,Fire |
| **Fire** | Yes |

### Base materials

- Concrete (cracked)
- Concrete (uncracked)
- Masonry (solid)

| Ordering designation | Anchor size | Drill bit diameter | Drilling depth | Max. fixture thickness at standard embedment depth | Base plate clearance hole | Sales pack quantity | Item number |
|---|---|---|---|---|---|---|---|
| **HAS-E M8X80/14** | M8 | | 80 mm | 14 mm | 10 mm | 20 pc | **332219** |
| **HAS-E M8X80/54** | M8 | | 80 mm | 54 mm | 10 mm | 10 pc | **333099**[1)] |
| **HAS-E M10X90/21** | M10 | 12 mm | 90 mm | 21 mm | 12 mm | 20 pc | **332220** |
| **HAS-E M10X90/61** | M10 | 12 mm | 90 mm | 61 mm | 12 mm | 10 pc | **333100**[1)] |
| **HAS-E M10X90/81** | M10 | 12 mm | 90 mm | 81 mm | 12 mm | 10 pc | **333101**[1)] |
| **HAS-E M12X110/28** | M12 | 14 mm | 110 mm | 28 mm | 14 mm | 20 pc | **332221** |
| **HAS-E M12X110/88** | M12 | 14 mm | 110 mm | 88 mm | 14 mm | 10 pc | **333102**[1)] |
| **HAS-E M12X110/128** | M12 | 14 mm | 110 mm | 128 mm | 14 mm | 10 pc | **333103**[1)] |
| **HAS-E M16X125/38** | M16 | 18 mm | 125 mm | 38 mm | 18 mm | 20 pc | **332222** |
| **HAS-E M16X125/108** | M16 | 18 mm | 125 mm | 108 mm | 18 mm | 10 pc | **333106**[1)] |
| **HAS-E M20X170/48** | M20 | 22 mm | 170 mm | 48 mm | 22 mm | 10 pc | **332223** |
| **HAS-E M20X170/68** | M20 | 22 mm | 170 mm | 68 mm | 22 mm | 10 pc | **333110**[1)] |
| **HAS-E M20X170/108** | M20 | 22 mm | 170 mm | 108 mm | 22 mm | 10 pc | **333111**[1)] |
| **HAS-E M20X170/158** | M20 | 22 mm | 170 mm | 158 mm | 22 mm | 10 pc | **333112**[1)] |
| **HAS-E M20X170/208** | M20 | 22 mm | 170 mm | 208 mm | 22 mm | 10 pc | **333113**[1)] |
| **HAS-E M24X210/54** | M24 | 28 mm | 210 mm | 54 mm | 26 mm | 10 pc | **332224** |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

## Anchor rod (5.8 hot-dip galvanized) HAS-E-F

### Approvals

| | |
|---|---|
| ETA | (ETAG 001-05, Option 7) |
| | ETA-05/0255 for HVU (ETAG 001-05, Option 7) |
| | ETA-09/0265 for HIT-HY70 concrete (ETAG 001-5, Option 7) |

Approvals and test reports may apply to selected products only. Please refer to the documents for details.

CE

### Technical data

| | |
|---|---|
| **Head configuration** | Externally threaded |
| **Material composition** | Steel, 5.8 grade, hot-dip galvanized (min. 43 µm) |
| **Material, corrosion** | Steel, sherardized / hot-dip galvanized |
| **Anchor type** | Off-the-shelf rods |
| **Fire** | Yes |
| **Installation direction** | All |

### Base materials

- Concrete (cracked)
- Concrete (uncracked)
- Masonry (solid)

| Ordering designation | Anchor size | Drill bit diameter | Drilling depth | Max. fixture thickness at standard embedment depth | Base plate clearance hole | Sales pack quantity | Item number |
|---|---|---|---|---|---|---|---|
| **HAS-E-F M10X90/61** | M10 | 12 mm | 90 mm | 61 mm | 12 mm | 10 pc | **333146**[1)] |
| **HAS-E-F M12X110/28** | M12 | 14 mm | 110 mm | 28 mm | 14 mm | 20 pc | **333148**[1)] |
| **HAS-E-F M12X110/88** | M12 | 14 mm | 110 mm | 88 mm | 14 mm | 10 pc | **333149**[1)] |
| **HAS-E-F M16X125/20** | M16 | 18 mm | 125 mm | 20 mm | 18 mm | 10 pc | **333152**[1)] |

| Ordering designation | Anchor size | Drill bit diameter | Drilling depth | Max. fixture thickness at standard embedment depth | Base plate clearance hole | Sales pack quantity | Item number |
|---|---|---|---|---|---|---|---|
| **HAS-E-F M16X125/38** | M16 | 18 mm | 125 mm | 38 mm | 18 mm | 20 pc | **333153**[1)] |
| **HAS-E-F M16X125/348** | M16 | 18 mm | 125 mm | 348 mm | 18 mm | 10 pc | **333157**[1)] |
| **HAS-E-F M20X170/48** | M20 | 24 mm | 170 mm | 48 mm | 22 mm | 10 pc | **333158**[1)] |
| **HAS-E-F M20X170/108** | M20 | 24 mm | 170 mm | 108 mm | 22 mm | 10 pc | **333160**[1)] |
| **HAS-E-F M24X210/54** | M24 | 28 mm | 210 mm | 54 mm | 26 mm | 10 pc | **333163**[1)] |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

## Anchor rod (A4 stainless steel) HAS-E-R

### Approvals

| | |
|---|---|
| ETA | (ETAG 001-05, Option 7) |
| | ETA-05/0255 for HVU (ETAG 001-05, Option 7) |
| | ETA-09/0265 for HIT-HY70 concrete (ETAG 001-5, Option 7) |

Approvals and test reports may apply to selected products only. Please refer to the documents for details.

### Technical data

| | |
|---|---|
| **Head configuration** | Externally threaded |
| **Material composition** | Steel, A4 (SS316) |
| **Material, corrosion** | Steel, stainless |
| **Anchor type** | Off-the-shelf rods |
| **Approvals / test reports** | ETA,Fire |
| **Fire** | Yes |

### Base materials

- Concrete (cracked)
- Concrete (uncracked)
- Masonry (solid)

| Ordering designation | Anchor size | Drill bit diameter | Drilling depth | Max. fixture thickness at standard embedment depth | Base plate clearance hole | Sales pack quantity | Item number |
|---|---|---|---|---|---|---|---|
| **HAS-E-R M8X80/14** | M8 | 10 mm | 80 mm | 14 mm | 9 mm | 20 pc | **333119** |
| **HAS-E-R M8X80/114** | M8 | 10 mm | 80 mm | 114 mm | 9 mm | 10 pc | **333121**[1)] |
| **HAS-E-R M10X90/21** | M10 | 12 mm | 90 mm | 21 mm | 12 mm | 20 pc | **333122** |
| **HAS-E-R M10X90/61** | M10 | 12 mm | 90 mm | 61 mm | 12 mm | 10 pc | **333123**[1)] |
| **HAS-E-R M12X110/28** | M12 | 14 mm | 110 mm | 28 mm | 14 mm | 20 pc | **333126** |
| **HAS-E-R M12X110/88** | M12 | 14 mm | 110 mm | 88 mm | 14 mm | 10 pc | **333127**[1)] |
| **HAS-E-R M12X110/128** | M12 | 14 mm | 110 mm | 128 mm | 14 mm | 10 pc | **333128**[1)] |
| **HAS-E-R M12X110/168** | M12 | 14 mm | 110 mm | 168 mm | 14 mm | 10 pc | **333129**[1)] |
| **HAS-E-R M16X125/38** | M16 | 18 mm | 125 mm | 38 mm | 18 mm | 20 pc | **333131** |
| **HAS-E-R M16X125/108** | M16 | 18 mm | 125 mm | 108 mm | 18 mm | 10 pc | **333132**[1)] |
| **HAS-E-R M20X170/48** | M20 | 24 mm | 170 mm | 48 mm | 22 mm | 10 pc | **333135** |
| **HAS-E-R M20X170/108** | M20 | 24 mm | 170 mm | 108 mm | 22 mm | 10 pc | **333136**[1)] |
| **HAS-E-R M24X210/54** | M24 | 28 mm | 210 mm | 54 mm | 26 mm | 10 pc | **333137** |
| **HAS-E-R M27X240/60** | M27 | 30 mm | 240 mm | 60 mm | 30 mm | 4 pc | **333138**[1)] |
| **HAS-E-R M30X270/70** | M30 | 35 mm | 270 mm | 70 mm | 33 mm | 4 pc | **333139**[1)] |
| **HAS-E-R M33X300/80** | M33 | 37 mm | 300 mm | 80 mm | 36 mm | 4 pc | **333140**[1)] |
| **HAS-E-R M36X330/90** | M36 | 40 mm | 330 mm | 90 mm | 39 mm | 2 pc | **333141**[1)] |
| **HAS-E-R M39X360/100** | M39 | 42 mm | 360 mm | 100 mm | 42 mm | 2 pc | **333142**[1)] |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

## Anchor rod (high corrosion resistance) HAS-E-HCR

| Approvals | |
|---|---|
| ETA | (ETAG 001-05, Option 7) |
| | ETA-09/0265 for HIT-HY70 concrete (ETAG 001-5, Option 7) |

Approvals and test reports may apply to selected products only. Please refer to the documents for details.

| Technical data | |
|---|---|
| **Head configuration** | Externally threaded |
| **Material composition** | Steel, high corrosion resistant (HCR) |
| **Material, corrosion** | Steel, high corrosion resistant (HCR) |
| **Anchor type** | N/A |
| **Approvals / test reports** | ETA |
| **Installation direction** | All |

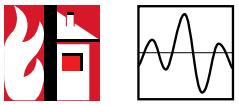
### Base materials

- Concrete (cracked)
- Concrete (uncracked)
- Masonry (solid)

| Ordering designation | Anchor size | Drill bit diameter | Drilling depth | Max. fixture thickness at standard embedment depth | Base plate clearance hole | Sales pack quantity | Item number |
|---|---|---|---|---|---|---|---|
| **HAS-E-HCR M10X90/21** | M10 | 12 mm | 90 mm | 21 mm | 12 mm | 10 pc | **229505**[1)] |
| **HAS-E-HCR M12X110/28** | M12 | 14 mm | 110 mm | 28 mm | 14 mm | 10 pc | **229506**[1)] |
| **HAS-E-HCR M16X125/38** | M16 | 18 mm | 125 mm | 38 mm | 18 mm | 5 pc | **229507**[1)] |
| **HAS-E-HCR M20X170/48** | M20 | 22 mm | 170 mm | 48 mm | 22 mm | 5 pc | **229508**[1)] |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

## Internally threaded sleeve (5.8 carbon steel) HIS-N



| Approvals | |
|---|---|
| ETA | (ETAG 001-05, Option 7) |

Approvals and test reports may apply to selected products only. Please refer to the documents for details.

| Technical data | |
|---|---|
| **Head configuration** | Inner thread |
| **Material composition** | Steel, 5.8 grade, zinc-plated (min. 5 µm) |
| **Material, corrosion** | Steel, zinc-plated |
| **Anchor type** | Internally threaded |
| **Approvals / test reports** | ETA |
| **Fire** | Yes |

### Base materials

- Concrete (uncracked)

| Ordering designation | Anchor size | Drill bit diameter | Base plate clearance hole | Sales pack quantity | Item number |
|---|---|---|---|---|---|
| **HIS-N M8X90** | M8 | 14 mm | 9 mm | 10 pc | **258015**[1)] |
| **HIS-N M10X110** | M10 | 18 mm | 12 mm | 10 pc | **258016**[1)] |
| **HIS-N M12X125** | M12 | 22 mm | 14 mm | 5 pc | **258017** |
| **HIS-N M16X170** | M16 | 28 mm | 18 mm | 5 pc | **258018** |
| **HIS-N M20X205** | M20 | 32 mm | 22 mm | 5 pc | **258019**[1)] |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

# Internally threaded sleeve (A4 stainless steel) HIS-RN

## Approvals

| | |
|---|---|
| ETA | (ETAG 001-05, Option 7) |

Approvals and test reports may apply to selected products only. Please refer to the documents for details.

## Technical data

| | |
|---|---|
| **Head configuration** | Inner thread |
| **Material composition** | Steel, A4 (SS316) |
| **Material, corrosion** | Steel, stainless |
| **Anchor type** | Internally threaded |
| **Approvals / test reports** | ETA |
| **Fire** | Yes |

## Base materials

- Concrete (cracked)
- Concrete (uncracked)

| Ordering designation | Anchor size | Drill bit diameter | Base plate clearance hole | Sales pack quantity | Item number |
|---|---|---|---|---|---|
| **HIS-RN M8X90 A4** | M8 | 14 mm | 9 mm | 10 pc | **258024**[1)] |
| **HIS-RN M10X110 A4** | M10 | 18 mm | 12 mm | 10 pc | **258025** |
| **HIS-RN M12X125 A4** | M12 | 22 mm | 14 mm | 5 pc | **258026** |
| **HIS-RN M16X170 A4** | M16 | 28 mm | 18 mm | 5 pc | **258027**[1)] |
| **HIS-RN M20X205 A4** | M20 | 32 mm | 22 mm | 5 pc | **258028**[1)] |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

## Accessories for blowing out drilled holes Hilti HIT

### Applications

- For fast and efficient removal of dust and debris from drilled holes of varying diameters and depths to allow correct installation of anchors and rebar

### Technical data

| | |
|---|---|
| **Dispenser, setting tool, accessory, tester type** | Cleaning accessories |

| Ordering designation | Sales pack quantity | Item number |
|---|---|---|
| **Blow-out pump** | 1 pc | **60579** |
| **Extension tube HIT-VL 16/0.7** | 10 pc | **336646** |

## Hilti HIT Profi accessories Air nozzle

### Applications

- Clearing dust and debris from drilled holes under various conditions including where adhesive anchors are set at great depth

### Technical data

| | |
|---|---|
| **Dispenser, setting tool, accessory, tester type** | Cleaning accessories |

### Advantages

- Fast, effective cleaning of drilled holes

| Ordering designation | Drill hole diameter | Sales pack quantity | Item number |
|---|---|---|---|
| **Air nozzle HIT-DL 20** | 20 mm | 1 pc | **371719**[1)] |
| **Air nozzle HIT-DL 25** | 25 mm | 1 pc | **371720**[1)] |
| **Air nozzle HIT-DL 32** | 32 mm | 1 pc | **371721**[1)] |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

## Accessories for using brushes to clean holes Hilti HIT

### Applications

- For the proper brushing of drilled holes of varying diameters and embedment depths

### Technical data

| | |
|---|---|
| **Dispenser, setting tool, accessory, tester type** | Cleaning accessories |

| Ordering designation | Drill hole diameter | Sales pack quantity | Item number |
|---|---|---|---|
| **Brush extension HIT-RBH** | | 1 pc | **229138**[1)] |
| **Brush extension HIT-RBV** | | 1 pc | **238727**[1)] |
| **Holder TE-Y** | | 1 pc | **263439**[1)] |
| **Brush extension HIT-RBS 10/0.7** | | 1 pc | **336645**[1)] |
| **Round brush 13 HG** | 12 mm | 1 pc | **229133** |
| **Round brush 18 HG** | 18 mm | 1 pc | **229134** |
| **Round brush 18 GA** | 18 mm | 1 pc | **229136**[1)] |
| **Round steel brush HIT-RB 20** | 20 mm | 1 pc | **336552**[1)] |
| **Round steel brush HIT-RB 25** | 25 mm | 1 pc | **336553**[1)] |
| **Round brush 28 HG** | 28 mm | 1 pc | **229135** |
| **Round brush 28 GA** | 28 mm | 1 pc | **229137**[1)] |
| **Round steel brush HIT-RB 30** | 30 mm | 1 pc | **380920**[1)] |
| **Round brush 38 GA** | 38 mm | 1 pc | **229673**[1)] |
| **Round steel brush HIT-RB 40** | 40 mm | 1 pc | **382260**[1)] |
| **Round steel brush HIT-RB 47** | 47 mm | 1 pc | **382264**[1)] |
| **Round brush 50 GA** | 50 mm | 1 pc | **229674**[1)] |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

## Setting tool TE-C-E

### Applications

- Setting tool for installing HAS-E

### Technical data

| | |
|---|---|
| **Dispenser, setting tool, accessory, tester type** | Setting tools |

| Ordering designation | Connection end | Sales pack quantity | Item number |
|---|---|---|---|
| **TE-C-E M8** | TE-C | 1 pc | **369223** |
| **TE-C-E M10** | TE-C | 1 pc | **369224** |
| **TE-C-E M12** | TE-C | 1 pc | **369225** |
| **TE-C-E M16** | TE-C | 1 pc | **369226** |

## Setting tool TE-Y-E

### Applications

- Setting tool for installing HAS-E

### Technical data

| | |
|---|---|
| **Dispenser, setting tool, accessory, tester type** | Setting tools |

| Ordering designation | Connection end | Sales pack quantity | Item number |
|---|---|---|---|
| **TE-Y-E M16** | TE-Y | 1 pc | **369227**[1)] |
| **TE-Y-E M20** | TE-Y | 1 pc | **369228**[1)] |
| **TE-Y-E M24** | TE-Y | 1 pc | **369229**[1)] |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

## Setting tool HIS-S

### Applications

- Setting tool for installing HIS

### Technical data

| | |
|---|---|
| **Dispenser, setting tool, accessory, tester type** | Setting tools |

| Ordering designation | Sales pack quantity | Item number |
|---|---|---|
| **HIS-S M8** | 1 pc | **45964**[1)] |
| **HIS-S M10** | 1 pc | **45965** |
| **HIS-S M12** | 1 pc | **45966** |
| **HIS-S M16** | 1 pc | **45967** |
| **HIS-S M20** | 1 pc | **45968**[1)] |

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

# HVA adhesive system (HVU with HAS anchor rod)

| Mortar system | Benefits |
|---|---|
|  Hilti HVU foil capsule<br>  HAS-E HAS-E R HAS-E HCR rod | - suitable for non-cracked concrete<br>- high loading capacity<br>- suitable for dry and water saturated concrete<br>- large diameter applications<br>- high corrosion resistant |


Concrete


Small edge distance and spacing


Fire resistance

Corrosion resistance

High corrosion resistance


European Technical Approval


CE conformity


PROFIS Anchor design software

## Approvals / certificates

| Description | Authority / Laboratory | No. / date of issue |
|---|---|---|
| European technical approval [a] | DIBt, Berlin | ETA-05/0255 / 2011-06-23 |
| Fire test report | IBMB, Braunschweig | UB-3333/0891-1 / 2004-03-26 |
| Fire test report ZTV-Tunnel | IBMB, Braunschweig | UB 3333/0891-2 / 2003-08-12 |
| Assessment report (fire) | warringtonfire | WF 166402 / 2007-10-26 |

a) All data given in this section according ETA-05/0255, issue 2011-06-23

## Basic loading data (for a single anchor)

**All data in this section applies to** For details see Simplified design method

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- *Steel* failure
- Base material thickness, as specified in the table
- One typical embedment depth, as specified in the table
- One anchor material, as specified in the tables
- Concrete C 20/25, $f_{ck,cube}$ = 25 N/mm²
- Temperate range I
  (min. base material temperature -40°C, max. long term/short term base material temperature: +24°C/40°C)
- Installation temperature range -5°C to +40°C





### Mean ultimate resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor HAS

| | | | Data according ETA-05/0255, issue 2011-06-23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor size** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** | **M27** | **M30** |
| Tensile $N_{Ru,m}$ | HAS-E [a] | [kN] | 17,9 | 27,3 | 39,9 | 75,6 | 117,6 | 168 | 250,3 | 298,7 |
| Shear $V_{Ru,m}$ | HAS-E [a] | [kN] | 8,9 | 13,7 | 20 | 37,8 | 58,8 | 84 | 182,7 | 221,6 |
| Tensile $N_{Ru,m}$ | HAS-ER (A4) | [kN] | 24,8 | 39,6 | 57,8 | 109,1 | 170,3 | 244,4 | 230,7 | 280,2 |
| Shear $V_{Ru,m}$ | HAS-ER (A4) | [kN] | 14,8 | 23,8 | 34,5 | 65,4 | 102,1 | 146,9 | 138,5 | 168,3 |

### Characteristic resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor HAS

| | | | Data according ETA-05/0255, issue 2011-06-23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor size** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** | **M27** | **M30** |
| Tensile $N_{Rk}$ | HAS-E [a] | [kN] | 17,0 | 26,0 | 38,0 | 60 | 111,9 | 140 | 187,8 | 224 |
| Shear $V_{Rk}$ | HAS-E [a] | [kN] | 8,5 | 13,0 | 19,0 | 36,0 | 56,0 | 80,0 | 174,0 | 211,0 |
| Tensile $N_{Rk}$ | HAS-ER (A4) | [kN] | 23,0 | 36,7 | 53,5 | 60 | 111,9 | 140 | 187,8 | 224 |
| Shear $V_{Rk}$ | HAS-ER (A4) | [kN] | 13,7 | 22,0 | 32,0 | 60,5 | 94,5 | 136,0 | 128,2 | 155,8 |

### Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor HAS

| | | | Data according ETA-05/0255, issue 2011-06-23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor size** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** | **M27** | **M30** |
| Tensile $N_{Rd}$ | HAS-E [a] | [kN] | 11,3 | 17,3 | 25,3 | 40 | 74,6 | 93,3 | 125,2 | 149,4 |
| Shear $V_{Rd}$ | HAS-E [a] | [kN] | 6,8 | 10,4 | 15,2 | 28,8 | 44,8 | 64 | 139,2 | 168,8 |
| Tensile $N_{Rd}$ | HAS-ER (A4) | [kN] | 12,4 | 19,8 | 28,6 | 40 | 74,6 | 93,3 | 75,9 | 92,2 |
| Shear $V_{Rd}$ | HAS-ER (A4) | [kN] | 7,7 | 12,2 | 17,3 | 32,7 | 50,6 | 71,8 | 45,8 | 55,5 |

### Recommended loads [b]: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor HAS

| | | | Data according ETA-05/0255, issue 2011-06-23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor size** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** | **M27** | **M30** |
| Tensile $N_{rec}$ | HAS-E [a] | [kN] | 5,7 | 8,7 | 12,7 | 20 | 37,3 | 46,7 | 62,6 | 74,7 |
| Shear $V_{rec}$ | HAS-E [a] | [kN] | 2,8 | 4,3 | 6,3 | 12,0 | 18,7 | 26,7 | 58,0 | 70,3 |
| Tensile $N_{rec}$ | HAS-ER (A4) | [kN] | 7,6 | 12,2 | 17,8 | 20 | 37,3 | 46,7 | 62,6 | 74,7 |
| Shear $V_{rec}$ | HAS-ER (A4) | [kN] | 4,6 | 7,3 | 10,7 | 20,2 | 31,5 | 45,3 | 42,7 | 51,9 |

a) The standard delivery program for HAS-E anchor rod: Grade 5.8 for HAS-E M8-M24, Grade 8.8 for M27-M39.
b) With overall global safety factor $\gamma$ = 3. The recommended loads vary according to the safety factor requirement from national regulations.

## Service temperature range

Hilti HVU adhesive may be applied in the temperature ranges given below. An elevated base material temperature may lead to a reduction of the design bond resistance.

| Temperature range | Base material temperature | Maximum long term base material temperature | Maximum short term base material temperature |
|---|---|---|---|
| Temperature range I | -40 °C to +40 °C | +24 °C | +40 °C |
| Temperature range II | -40 °C to +80 °C | +50 °C | +80 °C |
| Temperature range III | -40 °C to +120 °C | +72 °C | +120 °C |

**Max short term base material temperature**
Short-term elevated base material temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

**Max long term base material temperature**
Long-term elevated base material temperatures are roughly constant over significant periods of time.

## Materials

### Mechanical properties of HAS

| | | | Data according ETA-05/0255/0256/0257, issue 2011-06-23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor size** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** | **M27** | **M30** |
| Nominal tensile strength $f_{uk}$ | HAS-(E) | [N/mm²] | 500 | 500 | 500 | 500 | 500 | 500 | 800 | 800 |
| | HAS-(E)F | [N/mm²] | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 |
| | HAS –(E)R | [N/mm²] | 700 | 700 | 700 | 700 | 700 | 700 | 500 | 500 |
| | HAS –(E)HCR | [N/mm²] | 800 | 800 | 800 | 800 | 800 | 700 | - | - |
| Yield strength $f_{yk}$ | HAS-(E) | [N/mm²] | 400 | 400 | 400 | 400 | 400 | 400 | 640 | 640 |
| | HAS-(E)F | [N/mm²] | 640 | 640 | 640 | 640 | 640 | 640 | 640 | 640 |
| | HAS –(E)R | [N/mm²] | 450 | 450 | 450 | 450 | 450 | 450 | 210 | 210 |
| | HAS –(E)HCR | [N/mm²] | 600 | 600 | 600 | 600 | 600 | 400 | - | - |
| Stressed cross-section $A_s$ | HAS | [mm²] | 32,8 | 52,3 | 76,2 | 144 | 225 | 324 | 427 | 519 |
| Moment of resistance W | HAS | [mm³] | 27,0 | 54,1 | 93,8 | 244 | 474 | 809 | 1274 | 1706 |

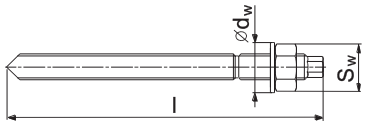
### Material quality

| Part | Material |
|---|---|
| Threaded rod<br>HAS-(E) M8-M24<br>HAS-(E) M27+M30 | Strength class 5.8, EN ISO 898-1, $A_5$ > 8% ductile<br>steel galvanized ≥ 5 µm, EN ISO 4042<br>(F) hot dipped galvanized ≥ 45 µm, EN ISO 10684 |
| Threaded rod<br>HAS-(E)F M8-M30<br>HAS-(E) M27+M30 | Strength class 8.8, EN ISO 898-1, $A_5$ > 8% ductile<br>steel galvanized ≥ 5 µm, EN ISO 4042<br>(F) hot dipped galvanized ≥ 45 µm, EN ISO 10684 |
| Threaded rod<br>HAS-(E)R | Stainless steel grade A4, $A_5$ > 8% ductile<br>strength class 70 for ≤ M24 and class 50 for M27 to M30, EN ISO 3506-1, EN 10088: 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 |
| Threaded rod<br>HAS-(E)HCR | High corrosion resistant steel, EN ISO 3506-1, EN 10088: 1.4529; 1.4565<br>strength ≤ M20: $R_m$ = 800 N/mm², $R_{p\,0.2}$ = 640 N/mm², $A_5$ > 8% ductile<br>M24: $R_m$ = 700 N/mm², $R_{p\,0.2}$ = 400 N/mm², $A_5$ > 8% ductile |
| Washer<br>ISO 7089 | Steel galvanized, EN ISO 4042; hot dipped galvanized, EN ISO 10684 |
| | Stainless steel, EN 10088: 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 |
| | High corrosion resistant steel, EN 10088: 1.4529; 1.4565 |
| Nut<br>EN ISO 4032 | Strength class 8, ISO 898-2<br>steel galvanized ≥ 5 µm, EN ISO 4042<br>hot dipped galvanized ≥ 45 µm, EN ISO 10684 |
| | Strength class 70, EN ISO 3506-2, stainless steel grade A4, EN 10088: 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 |
| | Strength class 70, EN ISO 3506-2, high corrosion resistant steel, EN 10088: 1.4529; 1.4565 |





## Anchor dimensions




| Anchor size | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|
| Anchor rod<br>HAS-E,<br>HAS-R, HAS-ER<br>HAS-HCR | | M8x80 | M10x90 | M12x110 | M16x125 | M20x170 | M24x210 | M27x240 | M30x270 |
| Anchor embedment depth | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| Anchor length $_l$ | [mm] | 110 | 130 | 160 | 190 | 240 | 290 | 340 | 380 |
| Width across flats $_{sw}$ | [mm] | 13 | 17 | 19 | 24 | 30 | 36 | 41 | 46 |
| Washer diameter $_{dw}$ | [mm] | 16 | 20 | 24 | 30 | 37 | 44 | 50 | 56 |

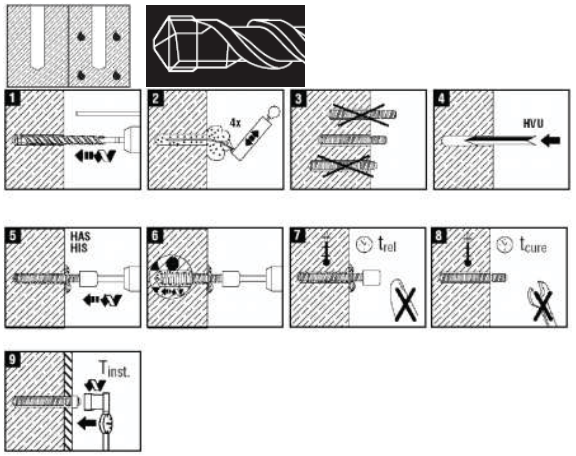
## Setting

### installation equipment

| Anchor size | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|
| Rotary hammer | TE 2 – TE 16 | | | | TE 40 – TE 70 | | | |
| Other tools | blow out pump or compressed air gun, setting tools | | | | | | | |

### Setting instruction

**Dry and water-saturated concrete, hammer drilling**




For detailed information on installation see instruction for use given with the package of the product.

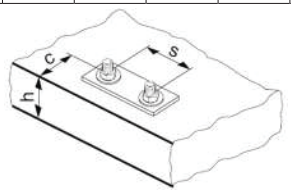
For technical data for anchors in diamond drilled holes please contact the Hilti Technical advisory service.

### Curing time for general conditions

| Data according ETA-05/0255/0256/0257, issue 2010-03-01 / 2006-01-20 | |
|---|---|
| **Temperature of the base material** | **Curing time before anchor can be fully loaded $t_{cure}$** |
| 20 °C to 40 °C | 20 min |
| 10 °C to 19 °C | 30 min |
| 0 °C to 9 °C | 1 h |
| -5 °C to - 1 °C | 5 h |

### Setting details

| | | | Data according ETA-05/0255/0256/0257, issue 2011-06-23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor size** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** | **M27** | **M30** |
| Nominal diameter of drill bit | $d_0$ | [mm] | 10 | 12 | 14 | 18 | 24 | 28 | 30 | 35 |
| Effective anchorage and drill hole depth | $h_{ef}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| Diameter of clearance hole in the fixture | $d_f$ | [mm] | 9 | 12 | 14 | 18 | 22 | 26 | 30 | 33 |
| Minimum spacing | $s_{min}$ | [mm] | 40 | 45 | 55 | 65 | 90 | 120 | 130 | 135 |
| Minimum edge distance | $c_{min}$ | [mm] | 40 | 45 | 55 | 65 | 90 | 120 | 130 | 135 |
| Critical spacing for splitting failure | $s_{cr,sp}$ | | 2 $c_{cr,sp}$ | | | | | | | |
| Critical edge distance for splitting failure Temperature range I | | | | | | | | | | |
| Optimized for minimum base material thickness | $h_{min}$ a) | [mm] | 140 | 160 | 210 | 210 | 340 | 370 | 480 | 540 |
| | $c_{cr,sp}$ | [mm] | 160 | 180 | 220 | 250 | 340 | 420 | 480 | 540 |
| Optimized for minimum spacing | $h_{min}$ a) | [mm] | 160 | 180 | 220 | 250 | 340 | 420 | 480 | 540 |
| | $c_{cr,sp}$ | [mm] | 100 | 130 | 180 | 180 | 340 | 340 | 480 | 540 |
| Critical edge distance for splitting failure Temperature range II | | | | | | | | | | |
| Optimized for minimum base material thickness | $h_{min}$ a) | [mm] | 110 | 120 | 170 | 170 | 220 | 300 | 340 | 380 |
| | $c_{cr,sp}$ | [mm] | 130 | 150 | 220 | 250 | 340 | 420 | 480 | 540 |
| Optimized for minimum spacing | $h_{min}$ a) | [mm] | 160 | 180 | 220 | 250 | 340 | 420 | 480 | 540 |
| | $c_{cr,sp}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| Critical edge distance for splitting failure Temperature range III | | | | | | | | | | |
| | $h_{min}$ a) | [mm] | 110 | 120 | 140 | 170 | 220 | 270 | 300 | 340 |
| | $c_{cr,sp}$ | [mm] | 80 | 90 | 110 | 125 | 170 | 210 | 240 | 270 |
| Critical spacing for concrete cone failure | $s_{cr,N}$ | | 2 $c_{cr,N}$ | | | | | | | |
| Critical edge distance for concrete cone failure | $c_{cr,N}$ | | 1,5 $h_{ef}$ | | | | | | | |
| Torque moment b) | $T_{max}$ | [Nm] | 10 | 20 | 40 | 80 | 150 | 200 | 270 | 300 |




For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced.

a) h: base material thickness ($h \geq h_{min}$)

b) This is the maximum recommended torque moment to avoid splitting failure during installation for anchors with minimum spacing and/or edge distance.





### Simplified design method

Simplified version of the design method according ETAG 001, Annex C. Design resistance according data given in ETA-05/0255/0256/0257, issue 2011-06-23.

- Influence of concrete strength
- Influence of edge distance
- Influence of spacing
- Valid for a group of two anchors. (The method may also be applied for anchor groups with more than two anchors or more than one edge distance. The influencing factors must then be considered for each edge distance and spacing. The calculated design loads are then on the save side: They will be lower than the exact values according ETAG 001, Annex C. To avoid this, it is recommended to use the anchor design software PROFIS anchor)

The design method is based on the following simplification:

- No different loads are acting on individual anchors (no eccentricity)

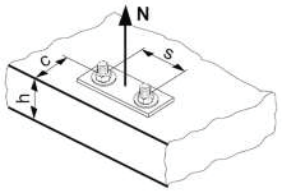
The values are valid for one anchor.

For more complex fastening applications please use the anchor design software PROFIS Anchor.

## Tension loading

### The design tensile resistance is the lower value of

- Steel resistance: $N_{Rd,s}$
- Combined pull-out and concrete cone resistance:
  $N_{Rd,p} = N^0_{Rd,p} \cdot f_{B,p} \cdot f_{h,p}$
- Concrete cone resistance: $N_{Rd,c} = N^0_{Rd,c} \cdot f_B \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{h,N} \cdot f_{re,N}$
- Concrete splitting resistance (only non-cracked concrete):
  $N_{Rd,sp} = N^0_{Rd,c} \cdot f_B \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{h,sp} \cdot f_{re,N}$




### Basic design tensile resistance

**Design steel resistance $N_{Rd,s}$** $\gamma_{Ms}$ = 1.5 (HAS-E) 1.87 (HAS-ER)

| | | | Data according ETA-05/0255/0256/0257, issue 2011-06-23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor size** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** | **M27** | **M30** |
| $N_{Rd,s}$ | HAS -(E) | [kN] | 11,1 | 17,6 | 25,4 | 48,1 | 74,8 | 106,8 | 231,3 | 281,0 |
| | HAS -(E)F | [kN] | 17,7 | 28,2 | 40,6 | 76,9 | 119,6 | 170,9 | 231,3 | 281,0 |
| | HAS (-E)-R | [kN] | 12,4 | 19,8 | 28,6 | 54,1 | 84,1 | 120,2 | 75,9 | 92,2 |
| | HAS (-E)-HCR | [kN] | 17,7 | 28,2 | 40,6 | 76,9 | 119,6 | 106,8 | - | - |

### Design combined pull-out and concrete cone resistance $N_{Rd,p} = N^0_{Rd,p} \cdot f_{B,p} \cdot f_{h,p}$ $\gamma_{Mp} = 1.5$

| | Data according ETA-05/0255/0256/0257, issue 2011-06-23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Anchor size** | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** | **M27** | **M30** |
| **Typical embedment depth $h_{ef,typ}$ [mm]** | **80** | **90** | **110** | **125** | **170** | **200** | **210** | **270** |
| $N^0_{Rd,p}$ Temperature range I [kN] | 16,7 | 23,3 | 33,3 | 40,0 | 76,7 | 93,3 | 133,3 | 166,7 |
| $N^0_{Rd,p}$ Temperature range II [kN] | 13,3 | 16,7 | 26,7 | 33,3 | 50,0 | 76,7 | 93,3 | 113,3 |
| $N^0_{Rd,p}$ Temperature range III [kN] | 6,0 | 8,0 | 10,7 | 16,7 | 26,7 | 40,0 | 50,0 | 50,0 |

### Design concrete cone resistance $N_{Rd,c} = N^0_{Rd,c} \cdot f_B \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{h,N} \cdot f_{re,N}$

### Design splitting resistance a) $N_{Rd,sp} = N^0_{Rd,c} \cdot f_B \cdot f_{h,N} \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{re,N}$ $\gamma_{Mc} = 1.5$

| | Data according ETA-05/0255/0256/0257, issue 2011-06-23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Anchor size** | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** | **M27** | **M30** |
| $N^0_{Rd,c}$ [kN] | 24,1 | 28,7 | 38,8 | 47,1 | 74,6 | 102,5 | 125,2 | 149,4 |

a) Splitting resistance must only be considered for non-cracked concrete

## Influencing factors

### Influence of concrete strength on combined pull-out and concrete cone resistance

| **Concrete strength designation (ENV 206)** | **C 20/25** | **C 25/30** | **C 30/37** | **C 35/45** | **C 40/50** | **C 45/55** | **C 50/60** |
|---|---|---|---|---|---|---|---|
| $f_{B,p} = (f_{ck,cube}/25N/mm^2)^{0,1}$ a) b) | 1 | 1,02 | 1,04 | 1,06 | 1,07 | 1,08 | 1,09 |

a) $f_{ck,cube}$ = concrete compressive strength, measured on cubes with 150 mm side length
b) For design data for $f_{ck,cube}$ = 15 and 20, please contact Hilti Technical Advisory Service

### Influence of embedment depth on combined pull-out and concrete cone resistance

$$f_{h,p} = 1$$

### Influence of concrete strength on concrete cone resistance

| **Concrete strength designation (ENV 206)** | **C 20/25** | **C 25/30** | **C 30/37** | **C 35/45** | **C 40/50** | **C 45/55** | **C 50/60** |
|---|---|---|---|---|---|---|---|
| $f_B = (f_{ck,cube}/25N/mm^2)^{1/2}$ a) | 1 | 1,1 | 1,22 | 1,34 | 1,41 | 1,48 | 1,55 |

a) $f_{ck,cube}$ = concrete compressive strength, measured on cubes with 150 mm side length
b) For design data of $f_{ck,cube}$ = 15 and 20, please contact Hilti technical advisory service

### Influence of edge distance a)

| **$c/c_{cr,N}$** / **$c/c_{cr,sp}$** | **0,1** | **0,2** | **0,3** | **0,4** | **0,5** | **0,6** | **0,7** | **0,8** | **0,9** | **1** |
|---|---|---|---|---|---|---|---|---|---|---|
| $f_{1,N} = 0,7 + 0,3 \cdot c/c_{cr,N}$ | 0,73 | 0,76 | 0,79 | 0,82 | 0,85 | 0,88 | 0,91 | 0,94 | 0,97 | 1 |
| $f_{1,sp} = 0,7 + 0,3 \cdot c/c_{cr,sp}$ | | | | | | | | | | |
| $f_{2,N} = 0,5 \cdot (1 + c/c_{cr,N})$ | 0,55 | 0,60 | 0,65 | 0,70 | 0,75 | 0,80 | 0,85 | 0,90 | 0,95 | 1 |
| $f_{2,sp} = 0,5 \cdot (1 + c/c_{cr,sp})$ | | | | | | | | | | |

a) The the edge distance shall not be smaller than the minimum edge distance $c_{min}$ given in the table with the setting details. These influencing factors must be considered for every edge distance smaller than the critical edge distance.





### Influence of anchor spacing a)

| **$s/s_{cr,N}$** / **$s/s_{cr,sp}$** | **0,1** | **0,2** | **0,3** | **0,4** | **0,5** | **0,6** | **0,7** | **0,8** | **0,9** | **1** |
|---|---|---|---|---|---|---|---|---|---|---|
| $f_{3,N} = 0,5 \cdot (1 + s/s_{cr,N})$ | 0,55 | 0,60 | 0,65 | 0,70 | 0,75 | 0,80 | 0,85 | 0,90 | 0,95 | 1 |
| $f_{3,sp} = 0,5 \cdot (1 + s/s_{cr,sp})$ | | | | | | | | | | |

a) The anchor spacing shall not be smaller than the minimum anchor spacing $s_{min}$ given in the table with the setting details. This influencing factor must be considered for every anchor spacing.

### Influence of embedment depth on concrete cone resistance

$$f_{h,N} = 1$$

### Influence of reinforcement

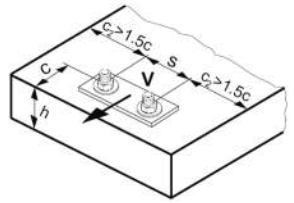
| **$h_{ef}$ [mm]** | **40** | **50** | **60** | **70** | **80** | **90** | **≥ 100** |
|---|---|---|---|---|---|---|---|
| $f_{re,N} = 0,5 + h_{ef}/200mm \le 1$ | 0,7 a) | 0,75 a) | 0,8 a) | 0,85 a) | 0,9 a) | 0,95 a) | 1 |

a) This factor applies only for dense reinforcement. If in the area of anchorage there is reinforcement with a spacing ≥ 150 mm (any diameter) or with a diameter ≤ 10 mm and a spacing ≥ 100 mm, then a factor $f_{re}$ = 1 may be applied.

## Shear loading

### The design shear resistance is the lower value of

- Steel resistance: $V_{Rd,s}$
- Concrete pryout resistance: $V_{Rd,cp} = k \cdot$ lower value of $N_{Rd,p}$ and $N_{Rd,c}$
- Concrete edge resistance: $V_{Rd,c} = V^0_{Rd,c} \cdot f_B \cdot f_{\beta} \cdot f_h \cdot f_4$




## Basic design shear resistance

### Design steel resistance $V_{Rd,s}$ $\gamma_{Ms}$ = 1.25 (HAS-E) 1.56 (HAS-ER)

| | | | Data according ETA-05/0255/0256/0257, issue 2011-06-23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Anchor size** | | | **M8** | **M10** | **M12** | **M16** | **M20** | **M24** | **M27** | **M30** |
| $V_{Rd,s}$ | HAS -(E) | [kN] | 6,6 | 10,6 | 15,2 | 28,8 | 44,9 | 64,1 | 138,8 | 168,6 |
| | HAS -(E)F | [kN] | 10,6 | 16,9 | 24,4 | 46,1 | 71,8 | 102,6 | 138,8 | 168,6 |
| | HAS (-E)-R | [kN] | 7,5 | 11,9 | 17,1 | 32,4 | 50,5 | 72,1 | 45,5 | 55,3 |
| | HAS (-E)-HCR | [kN] | 10,6 | 16,9 | 24,4 | 46,1 | 71,8 | 64,1 | - | - |

### Design concrete pryout resistance $V_{Rd,cp}$ = lower value a) of $k \cdot N_{Rd,p}$ and $k \cdot N_{Rd,c}$

$$k = 1 \text{ for } h_{ef} < 60 \text{ mm}$$
$$k = 2 \text{ for } h_{ef} \ge 60 \text{ mm}$$

a) $N_{Rd,p}$: Design combined pull-out and concrete cone resistance
$N_{Rd,c}$: Design concrete cone resistance

### Design concrete edge resistance [a] $V_{Rd,c} = V^0_{Rd,c} \cdot f_B \cdot f_{ß} \cdot f_h \cdot f_4$ $\gamma_{Mc} = 1.5$

| Anchor size | | M8 | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
|---|---|---|---|---|---|---|---|---|---|
| $V^0_{Rd,c}$ | [kN] | 6,7 | 8,8 | 13,1 | 17,7 | 31,9 | 48,3 | 62,8 | 79,2 |

a) For anchor groups only the anchors close to the edge must be considered.

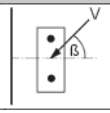
## Influencing factors

### Influence of concrete strength

| Concrete strength designation (ENV 206) | C 20/25 | C 25/30 | C 30/37 | C 35/45 | C 40/50 | C 45/55 | C 50/60 |
|---|---|---|---|---|---|---|---|
| $f_B = (f_{ck,cube}/25N/mm^2)^{1/2}$ a) | 1 | 1,1 | 1,22 | 1,34 | 1,41 | 1,48 | 1,55 |

a) $f_{ck,cube}$ = concrete compressive strength, measured on cubes with 150 mm side length
b) For design data of $f_{ck,cube}$ = 15 and 20, please contact Hilti technical advisory service

### Influence of angle between load applied and the direction perpendicular to the free edge

| Angle ß | 0° - 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° - 180° |
|---|---|---|---|---|---|---|---|---|
| $f_{ß}$  | 1 | 1,07 | 1,14 | 1,23 | 1,35 | 1,50 | 1,71 | 2 |



### Influence of base material thickness

| h/c | 0,15 | 0,3 | 0,45 | 0,6 | 0,75 | 0,9 | 1,05 | 1,2 | 1,35 | ≥ 1,5 |
|---|---|---|---|---|---|---|---|---|---|---|
| $f_h = \{h/(1,5 \cdot c)\}^{2/3} \leq 1$ | 0,22 | 0,34 | 0,45 | 0,54 | 0,63 | 0,71 | 0,79 | 0,86 | 0,93 | 1,00 |





### Influence of anchor spacing and edge distance [a] for concrete edge resistance: $f_4$

$f_4 = (c/h_{ef})^{1,5} \cdot (1 + s / [3 \cdot c]) \cdot 0,5$

| $c/h_{ef}$ | Single anchor | Group of two anchors $s/h_{ef}$ | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0,75 | 1,50 | 2,25 | 3,00 | 3,75 | 4,50 | 5,25 | 6,00 | 6,75 | 7,50 | 8,25 | 9,00 | 9,75 | 10,50 | 11,25 |
| 0,50 | 0,35 | 0,27 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 |
| 0,75 | 0,65 | 0,43 | 0,54 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 |
| 1,00 | 1,00 | 0,63 | 0,75 | 0,88 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 1,25 | 1,40 | 0,84 | 0,98 | 1,12 | 1,26 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 |
| 1,50 | 1,84 | 1,07 | 1,22 | 1,38 | 1,53 | 1,68 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 |
| 1,75 | 2,32 | 1,32 | 1,49 | 1,65 | 1,82 | 1,98 | 2,15 | 2,32 | 2,32 | 2,32 | 2,32 | 2,32 | 2,32 | 2,32 | 2,32 | 2,32 |
| 2,00 | 2,83 | 1,59 | 1,77 | 1,94 | 2,12 | 2,30 | 2,47 | 2,65 | 2,83 | 2,83 | 2,83 | 2,83 | 2,83 | 2,83 | 2,83 | 2,83 |
| 2,25 | 3,38 | 1,88 | 2,06 | 2,25 | 2,44 | 2,63 | 2,81 | 3,00 | 3,19 | 3,38 | 3,38 | 3,38 | 3,38 | 3,38 | 3,38 | 3,38 |
| 2,50 | 3,95 | 2,17 | 2,37 | 2,57 | 2,77 | 2,96 | 3,16 | 3,36 | 3,56 | 3,76 | 3,95 | 3,95 | 3,95 | 3,95 | 3,95 | 3,95 |
| 2,75 | 4,56 | 2,49 | 2,69 | 2,90 | 3,11 | 3,32 | 3,52 | 3,73 | 3,94 | 4,15 | 4,35 | 4,56 | 4,56 | 4,56 | 4,56 | 4,56 |
| 3,00 | 5,20 | 2,81 | 3,03 | 3,25 | 3,46 | 3,68 | 3,90 | 4,11 | 4,33 | 4,55 | 4,76 | 4,98 | 5,20 | 5,20 | 5,20 | 5,20 |
| 3,25 | 5,86 | 3,15 | 3,38 | 3,61 | 3,83 | 4,06 | 4,28 | 4,51 | 4,73 | 4,96 | 5,18 | 5,41 | 5,63 | 5,86 | 5,86 | 5,86 |
| 3,50 | 6,55 | 3,51 | 3,74 | 3,98 | 4,21 | 4,44 | 4,68 | 4,91 | 5,14 | 5,38 | 5,61 | 5,85 | 6,08 | 6,31 | 6,55 | 6,55 |
| 3,75 | 7,26 | 3,87 | 4,12 | 4,36 | 4,60 | 4,84 | 5,08 | 5,33 | 5,57 | 5,81 | 6,05 | 6,29 | 6,54 | 6,78 | 7,02 | 7,26 |
| 4,00 | 8,00 | 4,25 | 4,50 | 4,75 | 5,00 | 5,25 | 5,50 | 5,75 | 6,00 | 6,25 | 6,50 | 6,75 | 7,00 | 7,25 | 7,50 | 7,75 |
| 4,25 | 8,76 | 4,64 | 4,90 | 5,15 | 5,41 | 5,67 | 5,93 | 6,18 | 6,44 | 6,70 | 6,96 | 7,22 | 7,47 | 7,73 | 7,99 | 8,25 |
| 4,50 | 9,55 | 5,04 | 5,30 | 5,57 | 5,83 | 6,10 | 6,36 | 6,63 | 6,89 | 7,16 | 7,42 | 7,69 | 7,95 | 8,22 | 8,49 | 8,75 |
| 4,75 | 10,35 | 5,45 | 5,72 | 5,99 | 6,27 | 6,54 | 6,81 | 7,08 | 7,36 | 7,63 | 7,90 | 8,17 | 8,45 | 8,72 | 8,99 | 9,26 |
| 5,00 | 11,18 | 5,87 | 6,15 | 6,43 | 6,71 | 6,99 | 7,27 | 7,55 | 7,83 | 8,11 | 8,39 | 8,66 | 8,94 | 9,22 | 9,50 | 9,78 |
| 5,25 | 12,03 | 6,30 | 6,59 | 6,87 | 7,16 | 7,45 | 7,73 | 8,02 | 8,31 | 8,59 | 8,88 | 9,17 | 9,45 | 9,74 | 10,02 | 10,31 |
| 5,50 | 12,90 | 6,74 | 7,04 | 7,33 | 7,62 | 7,92 | 8,21 | 8,50 | 8,79 | 9,09 | 9,38 | 9,67 | 9,97 | 10,26 | 10,55 | 10,85 |

a) The anchor spacing and the edge distance shall not be smaller than the minimum anchor spacing $s_{min}$ and the minimum edge distance $c_{min}$.

## Combined tension and shear loading

For combined tension and shear loading see section “Anchor Design”.

# HVA adhesive system (HVU with HIS-(R)N)

| Mortar system | Benefits |
|---|---|
|  Hilti HVU foil capsule<br>  HIS-(R)N sleeve | - suitable for non-cracked concrete<br>- high loading capacity<br>- suitable for dry and water saturated concrete |


Concrete


Small edge distance and spacing


Fire resistance

Corrosion resistance


European Technical Approval


CE conformity


PROFIS Anchor design software

## Approvals / certificates

| Description | Authority / Laboratory | No. / date of issue |
|---|---|---|
| European technical approval [a] | DIBt, Berlin | ETA-05/0255 / 2011-06-23 |
| Fire test report | IBMB, Braunschweig | UB-3333/0891-1 / 2004-03-26 |
| Assessment report (fire) | warringtonfire | WF 166402 / 2007-10-26 |

a) All data given in this section according ETA-05/0255, issue 2011-06-23.

## Basic loading data (for a single anchor)

**All data in this section applies to** For details see Simplified design method

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- *Steel* failure
- Screw strength class 8.8 (HIS-N) or A4-70 (HIS-RN)
- Base material thickness, as specified in the table
- One typical embedment depth, as specified in the table
- One anchor material, as specified in the tables
- Concrete C 20/25, $f_{ck,cube}$ = 25 N/mm²
- Temperate range I
  (min. base material temperature -40°C, max. long term/short term base material temperature: +24°C/40°C)
- Installation temperature range -5°C to +40°C

### Embedment depth and base material thickness for the basic loading data.

**Characteristic resistance, design resistance, recommended loads.**

| Anchor size | M8 | M10 | M12 | M16 | M20 |
|---|---|---|---|---|---|
| Embedment depth [mm] | 90 | 110 | 125 | 170 | 205 |
| Base material thickness [mm] | 120 | 150 | 180 | 250 | 350 |





### Characteristic resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor HIS-N

| | | | Data according ETA-05/0255, issue 2011-06-23 | | | | |
|---|---|---|---|---|---|---|---|
| Anchor size | | | M8 | M10 | M12 | M16 | M20 |
| Tensile $N_{Rk}$ | HIS-N | [kN] | *25,0* | 40,0 | 60,0 | 95,0 | *109,0* |
| Shear $V_{Rk}$ | HIS-N | [kN] | *13,0* | *23,0* | *39,0* | *59,0* | *55,0* |
| Tensile $N_{Rk}$ | HIS-RN (A4) | [kN] | 25,0 | 40,0 | *59,0* | 95,0 | 140,0 |
| Shear $V_{Rk}$ | HIS-RN (A4) | [kN] | *13,0* | *20,0* | *30,0* | *55,0* | *83,0* |

### Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor HIS-N

| | | | Data according ETA-05/0255, issue 2011-06-23 | | | | |
|---|---|---|---|---|---|---|---|
| Anchor size | | | M8 | M10 | M12 | M16 | M20 |
| Tensile $N_{Rd}$ | HIS-N | [kN] | 16,7 | 26,7 | 40,0 | 63,3 | 74,1 |
| Shear $V_{Rd}$ | HIS-N | [kN] | 10,4 | 18,4 | 26,0 | 39,3 | 36,7 |
| Tensile $N_{Rk}$ | HIS-RN (A4) | [kN] | 16,7 | 26,7 | 31,6 | 63,3 | 69,1 |
| Shear $V_{Rk}$ | HIS-RN (A4) | [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 41,5 |

### Recommended loads [a]: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor HIS-N

| | | | Data according ETA-05/0255, issue 2011-06-23 | | | | |
|---|---|---|---|---|---|---|---|
| Anchor size | | | M8 | M10 | M12 | M16 | M20 |
| Tensile $N_{rec}$ | HIS-N | [kN] | 8,3 | 13,3 | 20,0 | 31,7 | 36,3 |
| Shear $V_{rec}$ | HIS-N | [kN] | 4,3 | 7,7 | 13,0 | 19,7 | 18,3 |
| Tensile $N_{Rk}$ | HIS-RN (A4) | [kN] | 8,3 | 13,3 | 19,7 | 31,7 | 46,7 |
| Shear $V_{Rk}$ | HIS-RN (A4) | [kN] | 4,3 | 6,7 | 10,0 | 18,3 | 27,7 |

a) With overall global safety factor $\gamma$ = 3. The recommended loads vary according to the safety factor requirement from national regulations.

## Service temperature range

Hilti HVU adhesive may be applied in the temperature ranges given below. An elevated base material temperature may lead to a reduction of the design bond resistance.

| Temperature range | Base material temperature | Maximum long term base material temperature | Maximum short term base material temperature |
|---|---|---|---|
| Temperature range I | -40 °C to +40 °C | +24 °C | +40 °C |
| Temperature range II | -40 °C to +80 °C | +50 °C | +80 °C |
| Temperature range III | -40 °C to +120 °C | +72 °C | +120 °C |

**Max short term base material temperature**
Short-term elevated base material temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

**Max long term base material temperature**
Long-term elevated base material temperatures are roughly constant over significant periods of time.

## Materials

### Mechanical properties of HIS-(R)N

| | | | Data according ETA-05/0255/0256, issue 2011-06-23 | | | | |
|---|---|---|---|---|---|---|---|
| **Anchor size** | | | **M8** | **M10** | **M12** | **M16** | **M20** |
| Nominal tensile strength $f_{uk}$ | HIS-N | [N/mm²] | 490 | 490 | 460 | 460 | 460 |
| | Screw 8.8 | [N/mm²] | 800 | 800 | 800 | 800 | 800 |
| | HIS-RN | [N/mm²] | 700 | 700 | 700 | 700 | 700 |
| | Screw A4-70 | [N/mm²] | 700 | 700 | 700 | 700 | 700 |
| Yield strength $f_{yk}$ | HIS-N | [N/mm²] | 410 | 410 | 375 | 375 | 375 |
| | Screw 8.8 | [N/mm²] | 640 | 640 | 640 | 640 | 640 |
| | HIS-RN | [N/mm²] | 350 | 350 | 350 | 350 | 350 |
| | Screw A4-70 | [N/mm²] | 450 | 450 | 450 | 450 | 450 |
| Stressed cross-section $A_s$ | HIS-(R)N | [mm²] | 51,5 | 108,0 | 169,1 | 256,1 | 237,6 |
| | Screw | [mm²] | 36,6 | 58 | 84,3 | 157 | 245 |
| Moment of resistance W | HIS-(R)N | [mm³] | 145 | 430 | 840 | 1595 | 1543 |
| | Screw | [mm³] | 31,2 | 62,3 | 109 | 277 | 541 |

### Material quality

| **Part** | **Material** |
|---|---|
| internally threaded sleeves [a] HIS-N | C-steel 1.0718, EN 10277-3<br>steel galvanized ≥ 5µm EN ISO 4042 |
| internally threaded sleeves [b] HIS-RN | stainless steel 1.4401 and 1.4571 EN 10088 |

a) related fastening screw: strength class 8.8 EN ISO 898-1, A5 > 8% Ductile
steel galvanized ≥ 5µm EN ISO 4042

b) related fastening screw: strength class 70 EN ISO 3506-1, A5 > 8% Ductile
stainless steel 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 EN 10088

## Anchor dimensions

| **Anchor size** | | **M8** | **M10** | **M12** | **M16** | **M20** |
|---|---|---|---|---|---|---|
| Internal sleeve HIS-(R)N | | M8x90 | M10x110 | M12x125 | M16x170 | M20x205 |
| Anchor embedment depth | [mm] | 90 | 110 | 125 | 170 | 205 |

## Setting

### installation equipment

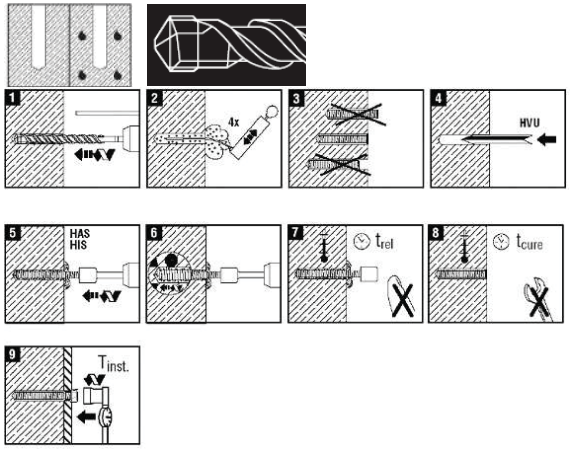
| **Anchor size** | **M8** | **M10** | **M12** | **M16** | **M20** |
|---|---|---|---|---|---|
| Rotary hammer | TE2 – TE16 | | TE40 – TE70 | | |
| Other tools | blow out pump or compressed air gun, setting tools | | | | |





## Setting instruction

### Dry and water-saturated concrete, hammer drilling




For detailed information on installation see instruction for use given with the package of the product.

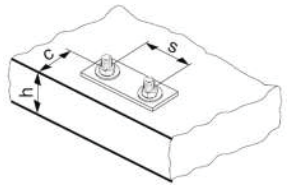
For technical data for anchors in diamond drilled holes please contact the Hilti Technical advisory service.

### Curing time for general conditions

| Data according ETA-05/0255/0256, issue 2011-06-23 | |
|---|---|
| **Temperature of the base material** | **Curing time before anchor can be fully loaded $t_{cure}$** |
| 20 °C to 40 °C | 20 min |
| 10 °C to 19 °C | 30 min |
| 0 °C to 9 °C | 1 h |
| -5 °C to - 1 °C | 5 h |

### Setting details

| Anchor size | Sleeve HIS-(R)N foil capsule | | Data according ETA-05/0255/0256, issue 2011-06-23 M8x90 M10x90 | M10x110 M12x110 | M12x125 M16x125 | M16x170 M20x170 | M20x205 M24x210 |
|---|---|---|---|---|---|---|---|
| Nominal diameter of drill bit | $d_0$ | [mm] | 14 | 18 | 22 | 28 | 32 |
| Diameter of element | d | [mm] | 12,5 | 16,5 | 20,5 | 25,4 | 27,6 |
| Effective anchorage and drill hole depth | $h_{ef}$ | [mm] | 90 | 110 | 125 | 170 | 205 |
| Diameter of clearance hole in the fixture | $d_f$ | [mm] | 9 | 12 | 14 | 18 | 22 |
| Thread engagement length; min - max | $h_s$ | [mm] | 8-20 | 10-25 | 12-30 | 16-40 | 20-50 |
| Minimum spacing | $s_{min}$ | [mm] | 40 | 45 | 60 | 80 | 125 |
| Minimum edge distance | $c_{min}$ | [mm] | 40 | 45 | 60 | 80 | 125 |
| Critical spacing for splitting failure | $s_{cr,sp}$ | | 2 $c_{cr,sp}$ | | | | |
| Critical edge distance for splitting failure Temperature range I | | | | | | | |
| Optimized for minimum base material thickness | $h_{min}$ [a] | [mm] | 120 | 150 | 180 | 250 | 350 |
| | $c_{cr,sp}$ | [mm] | 90 | 150 | 250 | 340 | 410 |
| Optimized for minimum spacing | $h_{min}$ [a] | [mm] | - | 220 | 250 | 340 | 410 |
| | $c_{cr,sp}$ | [mm] | - | 110 | 125 | 170 | 250 |
| Critical edge distance for splitting failure Temperature range II | | | | | | | |
| | $h_{min}$ [a] | [mm] | 120 | 150 | 170 | 230 | 270 |
| | $c_{cr,sp}$ | [mm] | 90 | 110 | 150 | 170 | 220 |
| Critical edge distance for splitting failure Temperature range III | | | | | | | |
| | $h_{min}$ [a] | [mm] | 120 | 150 | 170 | 230 | 270 |
| | $c_{cr,sp}$ | [mm] | 90 | 110 | 125 | 170 | 205 |
| Critical spacing for concrete cone failure | $s_{cr,N}$ | | 2 $c_{cr,N}$ | | | | |
| Critical edge distance for concrete cone failure | $c_{cr,N}$ | | 1,5 $h_{ef}$ | | | | |
| Torque moment [b] | $T_{max}$ | [Nm] | 10 | 20 | 40 | 80 | 150 |




For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced.

a) h: base material thickness ($h \geq h_{min}$)

b) This is the maximum recommended torque moment to avoid splitting failure during installation for anchors with minimum spacing and/or edge distance.





### Simplified design method

Simplified version of the design method according ETAG 001, Annex C. Design resistance according data given in ETA-05/0255/0256, issue 2011-06-23.

- Influence of concrete strength
- Influence of edge distance
- Influence of spacing
- Valid for a group of two anchors. (The method may also be applied for anchor groups with more than two anchors or more than one edge distance. The influencing factors must then be considered for each edge distance and spacing. The calculated design loads are then on the save side: They will be lower than the exact values according ETAG 001, Annex C. To avoid this, it is recommended to use the anchor design software PROFIS anchor)

The design method is based on the following simplification:

- No different loads are acting on individual anchors (no eccentricity)

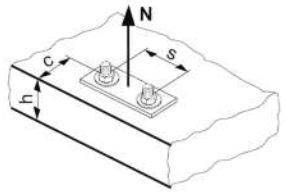
The values are valid for one anchor.

For more complex fastening applications please use the anchor design software PROFIS Anchor.

## Tension loading

### The design tensile resistance is the lower value of

- Steel resistance: $N_{Rd,s}$
- Combined pull-out and concrete cone resistance: $N_{Rd,p} = N^0_{Rd,p} \cdot f_{B,p} \cdot f_{h,p}$
- Concrete cone resistance: $N_{Rd,c} = N^0_{Rd,c} \cdot f_B \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{h,N} \cdot f_{re,N}$
- Concrete splitting resistance (only non-cracked concrete): $N_{Rd,sp} = N^0_{Rd,c} \cdot f_B \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{h,sp} \cdot f_{re,N}$




### Basic design tensile resistance

**Design steel resistance $N_{Rd,s}$** $\gamma_{Mc \geq 1.47}$

| Anchor size | | | Data according ETA-05/0255/0256, issue 2011-06-23 M8 | M10 | M12 | M16 | M20 |
|---|---|---|---|---|---|---|---|
| $N_{Rd,s}$ | HIS-N | [kN] | 16,8 | 30,7 | 44,7 | 80,3 | 74,1 |
| | HIS-RN | [kN] | 13,9 | 21,9 | 31,6 | 58,8 | 69,2 |

**Design combined pull-out and concrete cone resistance $N_{Rd,p} = N^0_{Rd,p} \cdot f_{B,p} \cdot f_{h,p}$** $\gamma_{Mp = 1.5}$

| | | | Data according ETA-05/0255/0256, issue 2011-06-23 | | | | |
|---|---|---|---|---|---|---|---|
| Anchor size | | | M8 | M10 | M12 | M16 | M20 |
| Embedment depth $h_{ef}$ [mm] | | | 90 | 110 | 125 | 170 | 205 |
| $N^0_{Rd,p}$ | Temperature range I | [kN] | 16,7 | 26,7 | 40,0 | 63,3 | 93,3 |
| $N^0_{Rd,p}$ | Temperature range II | [kN] | 13,3 | 23,3 | 33,3 | 50,0 | 63,3 |
| $N^0_{Rd,p}$ | Temperature range III | [kN] | 6,0 | 10,7 | 13,3 | 26,7 | 33,3 |

**Design concrete cone resistance** $N_{Rd,c} = N^0_{Rd,c} \cdot f_B \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{h,N} \cdot f_{re,N}$

**Design splitting resistance** [a] $N_{Rd,sp} = N^0_{Rd,c} \cdot f_B \cdot f_{h,N} \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{re,N}$ $\gamma_{Mc} = 1.5$

| | Data according ETA-05/0255/0256, issue 2011-06-23 | | | | |
|---|---|---|---|---|---|
| **Anchor size** | **M8** | **M10** | **M12** | **M16** | **M20** |
| $N^0_{Rd,c}$ [kN] | 28,7 | 38,8 | 47,1 | 74,6 | 98,8 |

a) Splitting resistance must only be considered for non-cracked concrete

## Influencing factors

### Influence of concrete strength on combined pull-out and concrete cone resistance

| **Concrete strength designation (ENV 206)** | **C 20/25** | **C 25/30** | **C 30/37** | **C 35/45** | **C 40/50** | **C 45/55** | **C 50/60** |
|---|---|---|---|---|---|---|---|
| $f_{B,p} = (f_{ck,cube}/25N/mm^2)^{0,1}$ [a] | 1 | 1,02 | 1,04 | 1,06 | 1,07 | 1,08 | 1,09 |

a) $f_{ck,cube}$ = concrete compressive strength, measured on cubes with 150 mm side length

### Influence of embedment depth on combined pull-out and concrete cone resistance

$$f_{h,p} = h_{ef}/h_{ef,typ}$$

### Influence of concrete strength on concrete cone resistance

| **Concrete strength designation (ENV 206)** | **C 20/25** | **C 25/30** | **C 30/37** | **C 35/45** | **C 40/50** | **C 45/55** | **C 50/60** |
|---|---|---|---|---|---|---|---|
| $f_B = (f_{ck,cube}/25N/mm^2)^{1/2}$ [a] | 1 | 1,1 | 1,22 | 1,34 | 1,41 | 1,48 | 1,55 |

a) $f_{ck,cube}$ = concrete compressive strength, measured on cubes with 150 mm side length
b) For design data of $f_{ck,cube}$ = 15 and 20, please contact Hilti technical advisory service

### Influence of edge distance [a]

| **$c/c_{cr,N}$** / **$c/c_{cr,sp}$** | **0,1** | **0,2** | **0,3** | **0,4** | **0,5** | **0,6** | **0,7** | **0,8** | **0,9** | **1** |
|---|---|---|---|---|---|---|---|---|---|---|
| $f_{1,N} = 0,7 + 0,3 \cdot c/c_{cr,N}$ / $f_{1,sp} = 0,7 + 0,3 \cdot c/c_{cr,sp}$ | 0,73 | 0,76 | 0,79 | 0,82 | 0,85 | 0,88 | 0,91 | 0,94 | 0,97 | 1 |
| $f_{2,N} = 0,5 \cdot (1 + c/c_{cr,N})$ / $f_{2,sp} = 0,5 \cdot (1 + c/c_{cr,sp})$ | 0,55 | 0,60 | 0,65 | 0,70 | 0,75 | 0,80 | 0,85 | 0,90 | 0,95 | 1 |

a) The the edge distance shall not be smaller than the minimum edge distance $c_{min}$ given in the table with the setting details. These influencing factors must be considered for every edge distance smaller than the critical edge distance.

### Influence of anchor spacing [a]

| **$s/s_{cr,N}$** / **$s/s_{cr,sp}$** | **0,1** | **0,2** | **0,3** | **0,4** | **0,5** | **0,6** | **0,7** | **0,8** | **0,9** | **1** |
|---|---|---|---|---|---|---|---|---|---|---|
| $f_{3,N} = 0,5 \cdot (1 + s/s_{cr,N})$ / $f_{3,sp} = 0,5 \cdot (1 + s/s_{cr,sp})$ | 0,55 | 0,60 | 0,65 | 0,70 | 0,75 | 0,80 | 0,85 | 0,90 | 0,95 | 1 |

a) The anchor spacing shall not be smaller than the minimum anchor spacing $s_{min}$ given in the table with the setting details. This influencing factor must be considered for every anchor spacing.

### Influence of embedment depth on concrete cone resistance

$$f_{h,N} = (h_{ef}/h_{ef,typ})^{1,5}$$





### Influence of reinforcement

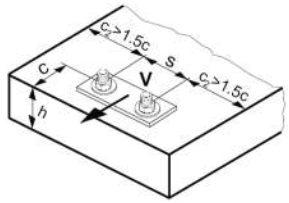
| $h_{ef}$ [mm] | 80 | 90 | ≥ 100 |
|---|---|---|---|
| $f_{re,N} = 0,5 + h_{ef}/200mm \le 1$ | 0,9 [a] | 0,95 [a] | 1 |

a) This factor applies only for dense reinforcement. If in the area of anchorage there is reinforcement with a spacing ≥ 150 mm (any diameter) or with a diameter ≤ 10 mm and a spacing ≥ 100 mm, then a factor $f_{re}$ = 1 may be applied.

# Shear loading

**The design shear resistance is the lower value of**

- Steel resistance: $V_{Rd,s}$
- Concrete pryout resistance: $V_{Rd,cp} = k \cdot$ lower value of $N_{Rd,p}$ and $N_{Rd,c}$
- Concrete edge resistance: $V_{Rd,c} = V^0_{Rd,c} \cdot f_B \cdot f_{ß} \cdot f_h \cdot f_4$




## Basic design shear resistance

### Design steel resistance $V_{Rd,s}$

$\gamma_{Ms}$ = vary according to ETA

| | | Data according ETA-05/0255/0256, issue 2011-06-23 | | | | |
|---|---|---|---|---|---|---|
| **Anchor size** | | **M8** | **M10** | **M12** | **M16** | **M20** |
| $V_{Rd,s}$ | HIS-N [kN] | 10,4 | 18,4 | 26,0 | 39,3 | 36,7 |
| | HIS-RN [kN] | 8,3 | 12,8 | 19,2 | 35,3 | 41,5 |

### Design concrete pryout resistance $V_{Rd,cp}$ = lower value[a] of $k \cdot N_{Rd,p}$ and $k \cdot N_{Rd,c}$

**k = 1 for $h_{ef}$ < 60 mm**
**k = 2 for $h_{ef}$ ≥ 60 mm**

a) $N_{Rd,p}$: Design combined pull-out and concrete cone resistance
$N_{Rd,c}$: Design concrete cone resistance

### Design concrete edge resistance [a] $V_{Rd,c} = V^0_{Rd,c} \cdot f_B \cdot f_{ß} \cdot f_h \cdot f_4$

$\gamma_{Mc} = 1.5$

| **Anchor size** | **M8** | **M10** | **M12** | **M16** | **M20** |
|---|---|---|---|---|---|
| $V^0_{Rd,c}$ [kN] | 9,4 | 14,4 | 19,1 | 34,3 | 48,4 |

a) For anchor groups only the anchors close to the edge must be considered.

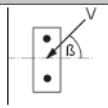
## Influencing factors

### Influence of concrete strength

| **Concrete strength designation (ENV 206)** | **C 20/25** | **C 25/30** | **C 30/37** | **C 35/45** | **C 40/50** | **C 45/55** | **C 50/60** |
|---|---|---|---|---|---|---|---|
| $f_B = (f_{ck,cube}/25N/mm^2)^{1/2}$ [a] | 1 | 1,1 | 1,22 | 1,34 | 1,41 | 1,48 | 1,55 |

a) $f_{ck,cube}$ = concrete compressive strength, measured on cubes with 150 mm side length
b) For design data of $f_{ck,cube}$ = 15 and 20, please contact Hilti technical advisory service

### Influence of angle between load applied and the direction perpendicular to the free edge

| Angle ß | 0° - 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° - 180° |
|---|---|---|---|---|---|---|---|---|
| $f_ß$  | 1 | 1,07 | 1,14 | 1,23 | 1,35 | 1,50 | 1,71 | 2 |

### Influence of base material thickness

| h/c | 0,15 | 0,3 | 0,45 | 0,6 | 0,75 | 0,9 | 1,05 | 1,2 | 1,35 | ≥ 1,5 |
|---|---|---|---|---|---|---|---|---|---|---|
| $f_h = \{h/(1,5 \cdot c)\}^{2/3} \le 1$ | 0,22 | 0,34 | 0,45 | 0,54 | 0,63 | 0,71 | 0,79 | 0,86 | 0,93 | 1,00 |

### Influence of anchor spacing and edge distance [a] for concrete edge resistance: $f_4$

$f_4 = (c/h_{ef})^{1,5} \cdot (1 + s / [3 \cdot c]) \cdot 0,5$

| $c/h_{ef}$ | Single anchor | Group of two anchors $s/h_{ef}$ | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0,75 | 1,50 | 2,25 | 3,00 | 3,75 | 4,50 | 5,25 | 6,00 | 6,75 | 7,50 | 8,25 | 9,00 | 9,75 | 10,50 | 11,25 |
| 0,50 | 0,35 | 0,27 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 | 0,35 |
| 0,75 | 0,65 | 0,43 | 0,54 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 | 0,65 |
| 1,00 | 1,00 | 0,63 | 0,75 | 0,88 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| 1,25 | 1,40 | 0,84 | 0,98 | 1,12 | 1,26 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 |
| 1,50 | 1,84 | 1,07 | 1,22 | 1,38 | 1,53 | 1,68 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 |
| 1,75 | 2,32 | 1,32 | 1,49 | 1,65 | 1,82 | 1,98 | 2,15 | 2,32 | 2,32 | 2,32 | 2,32 | 2,32 | 2,32 | 2,32 | 2,32 | 2,32 |
| 2,00 | 2,83 | 1,59 | 1,77 | 1,94 | 2,12 | 2,30 | 2,47 | 2,65 | 2,83 | 2,83 | 2,83 | 2,83 | 2,83 | 2,83 | 2,83 | 2,83 |
| 2,25 | 3,38 | 1,88 | 2,06 | 2,25 | 2,44 | 2,63 | 2,81 | 3,00 | 3,19 | 3,38 | 3,38 | 3,38 | 3,38 | 3,38 | 3,38 | 3,38 |
| 2,50 | 3,95 | 2,17 | 2,37 | 2,57 | 2,77 | 2,96 | 3,16 | 3,36 | 3,56 | 3,76 | 3,95 | 3,95 | 3,95 | 3,95 | 3,95 | 3,95 |
| 2,75 | 4,56 | 2,49 | 2,69 | 2,90 | 3,11 | 3,32 | 3,52 | 3,73 | 3,94 | 4,15 | 4,35 | 4,56 | 4,56 | 4,56 | 4,56 | 4,56 |
| 3,00 | 5,20 | 2,81 | 3,03 | 3,25 | 3,46 | 3,68 | 3,90 | 4,11 | 4,33 | 4,55 | 4,76 | 4,98 | 5,20 | 5,20 | 5,20 | 5,20 |
| 3,25 | 5,86 | 3,15 | 3,38 | 3,61 | 3,83 | 4,06 | 4,28 | 4,51 | 4,73 | 4,96 | 5,18 | 5,41 | 5,63 | 5,86 | 5,86 | 5,86 |
| 3,50 | 6,55 | 3,51 | 3,74 | 3,98 | 4,21 | 4,44 | 4,68 | 4,91 | 5,14 | 5,38 | 5,61 | 5,85 | 6,08 | 6,31 | 6,55 | 6,55 |
| 3,75 | 7,26 | 3,87 | 4,12 | 4,36 | 4,60 | 4,84 | 5,08 | 5,33 | 5,57 | 5,81 | 6,05 | 6,29 | 6,54 | 6,78 | 7,02 | 7,26 |
| 4,00 | 8,00 | 4,25 | 4,50 | 4,75 | 5,00 | 5,25 | 5,50 | 5,75 | 6,00 | 6,25 | 6,50 | 6,75 | 7,00 | 7,25 | 7,50 | 7,75 |
| 4,25 | 8,76 | 4,64 | 4,90 | 5,15 | 5,41 | 5,67 | 5,93 | 6,18 | 6,44 | 6,70 | 6,96 | 7,22 | 7,47 | 7,73 | 7,99 | 8,25 |
| 4,50 | 9,55 | 5,04 | 5,30 | 5,57 | 5,83 | 6,10 | 6,36 | 6,63 | 6,89 | 7,16 | 7,42 | 7,69 | 7,95 | 8,22 | 8,49 | 8,75 |
| 4,75 | 10,35 | 5,45 | 5,72 | 5,99 | 6,27 | 6,54 | 6,81 | 7,08 | 7,36 | 7,63 | 7,90 | 8,17 | 8,45 | 8,72 | 8,99 | 9,26 |
| 5,00 | 11,18 | 5,87 | 6,15 | 6,43 | 6,71 | 6,99 | 7,27 | 7,55 | 7,83 | 8,11 | 8,39 | 8,66 | 8,94 | 9,22 | 9,50 | 9,78 |
| 5,25 | 12,03 | 6,30 | 6,59 | 6,87 | 7,16 | 7,45 | 7,73 | 8,02 | 8,31 | 8,59 | 8,88 | 9,17 | 9,45 | 9,74 | 10,02 | 10,31 |
| 5,50 | 12,90 | 6,74 | 7,04 | 7,33 | 7,62 | 7,92 | 8,21 | 8,50 | 8,79 | 9,09 | 9,38 | 9,67 | 9,97 | 10,26 | 10,55 | 10,85 |

a) The anchor spacing and the edge distance shall not be smaller than the minimum anchor spacing $s_{min}$ and the minimum edge distance $c_{min}$.

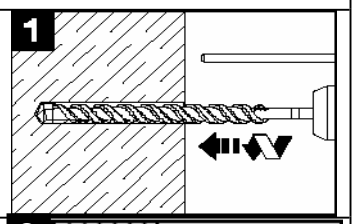
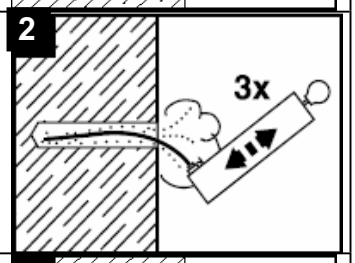
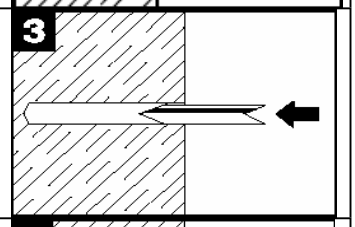
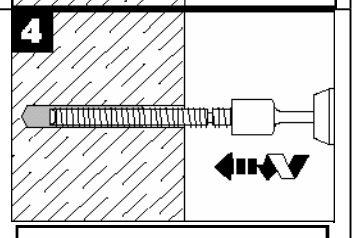
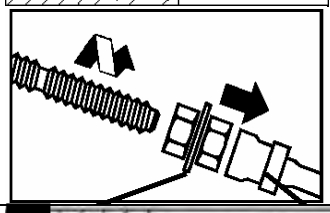
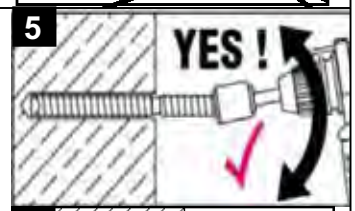
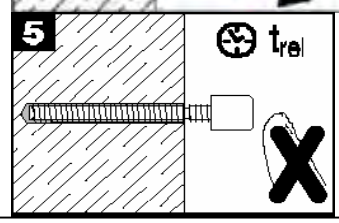
## Combined tension and shear loading

For combined tension and shear loading see section “Anchor Design”.

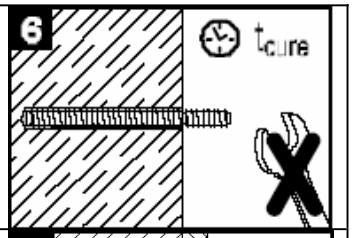
## Hilti HVA Adhesive System

*Versions : HVU capsule + HAS-E or HAS-ER*
*Reference : Product Information / Fastening Technology Manual*

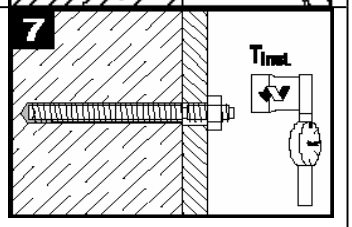
**Setting Operation:**

| | |
|---|---|
| 1. Drill the anchor hole with dimension according to installation details. |  |
| 2. Clean the drilled hole with the blow-out pump. |  |
| 3. Insert the adhesive capsule *(HVU)* into the hole. |  |
| 4. Drive the threaded rod *(HAS-E or HAS-ER)* into the hole up to the depth of embedment mark using hammer drill with the setting tools (TE-C-E or TE-Y-E)<br><br>Or<br><br>Using double nut setting method. |  <br>  |
| 5. If using TE-C-E or TE-C-E setting tools, immediately tip hammer drill sideways back & forth gently to "break off" the setting tool from the rod.<br><br>Or<br><br>If using double nut setting, leave the rod adapter remaining attached and allow gel time to pass. |  <br>  |

6. For double nut setting, remove the rod adapter only after the cure time was passed.




7. Put the part to be fastened in place and tighten the nut after the adhesive has completely cured.



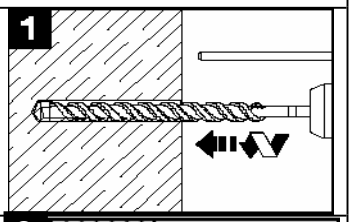

| Base material temperature | Gel time | Curing time |
|---|---|---|
| (°C) | $t_{gel}$ | $t_{cure}$ |
| -5 – 0 | 60 min | 5 h |
| 0 – 10 | 30 min | 60 min |
| 10 – 20 | 20 min | 30 min |
| 20 - 40 | 8 min | 20 min |

## Hilti HVA Adhesive System + HIS-N and HIS-RN

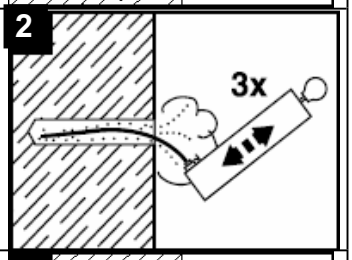
*Versions : HVU capsule + HIS-N or HIS-RN*
*Reference : Product Information / Fastening Technology Manual*

**Setting Operation:**

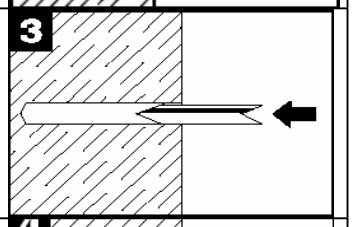
1. Drill the anchor hole with dimension according to installation details.



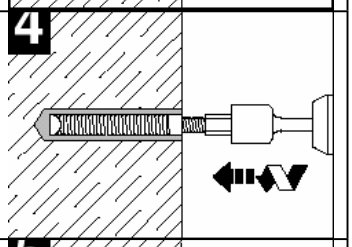

2. Clean the drilled hole with the blow-out pump.



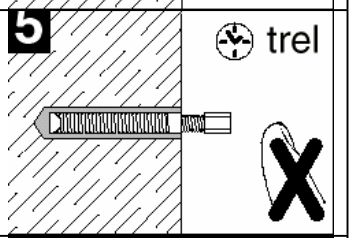

3. Insert the adhesive capsule *(HVU)* into the hole.



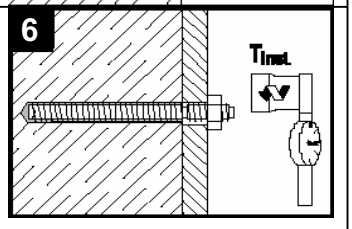

4. Set the anchor sleeve (HIS-N or HIS-RN) by using hammer drill with HIS-S setting tools such that it is flush with the base material surface.




5. Leave the setting tools or rod adapter remaining attached and remove it only the cure time was passed.




6. Put the part to be fastened in place and fasten the part using bolt or others.




| Base material temperature | Gel time | Curing time |
|---|---|---|
| (°C) | $t_{gel}$ | $t_{cure}$ |
| -5 – 0 | 60 min | 5 h |
| 0 – 10 | 30 min | 60 min |
| 10 – 20 | 20 min | 30 min |
| 20 - 40 | 8 min | 20 min |

Buildings Department
屋宇署

YOUR REF 來函檔號: 729-519
OUR REF 本署檔號 (3) in BD/GR/SEG/PPA(G)
FAX 圖文傳真: 2626 1762
TEL 電話: 2626 1583

Hilti (Hong Kong) Limited
17/F, Tower 6,
China Hong Kong City,
33 Canton Road,
Tsimshatsui,
Kowloon.

4 June, 1997

Attention: Mr. Denny Wu

Dear Sir,

**Procedures for building materials submission**

I refer to your letter dated 19 May, 1997 concerning the above.

2. Please be advised that there is no provision under the Buildings Ordinance for the Building Authority to approve any proprietary building products. Under the Buildings Ordinance, authorized persons and/or registered structural engineers are required to supervise building works including the selection and installation of proprietary building products and to certify compliance with the Buildings Ordinance upon completion of works. They are therefore responsible for ensuring the health and structural safety requirements, inter alia, of these building products in the building projects which they have been appointed by the developer to co-ordinate and supervise. It is also their responsibility to ensure these products have been installed in accordance with the manufacturers' specifications and complied with the Buildings Ordinance and Regulations.

3. In establishing the acceptability of the proprietary products in building works, reference may be made to the performance standards laid down in Building (Construction) Regulations 1990 and the current Practice Note for Authorized Persons and Registered Structural Engineers 140 in which performance requirements for compliance are given. Reliance may also be placed on the test/assessment report prepared by a recognized laboratory or an equivalent establishment.

**4.** Before the proprietary products are installed in a building project, the authorized person and/or registered structural engineer appointed for the project should be approached by the manufacturers or their agents for advice and guidance. **Prior approval/acceptance from the Buildings Department is not required.**

5. Generally, all relevant information supporting the use of the proprietary products in building works under the Buildings Ordinance should be submitted associated with the prescribed plans for approval on project basis.

/ Notwithstanding....



12/F-18/F Pioneer Centre, 750 Nathan Road, Mongkok, Kowloon, Hong Kong. 香港九龍旺角彌敦道七五〇號始創中心十二樓至十八樓

Buildings Department
屋宇署

YOUR REF 來函檔號: 729-519
OUR REF 本署檔號 in BD/GR/SEG/PPA(G)
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6. Notwithstanding the above, the proprietary building products to which 'No objection' letters have been given are still recognized as accepted constructional materials to be used in building works under the Buildings Ordinance provided that all conditions specified in the letters are satisfied. You are informed that the procedures currently adopted by the Building Authority for processing statutory approval of plans which involve the use of these proprietary building products remain unchanged.

7. It is a fact that the 'No objection' letter giving general acceptance to a proprietary building product is based on the technical information submitted to this Department at the time of its application. Should there be any significant modification to these technical information, the product will certainly be considered as 'new' product. The acceptability of such proprietary product in building works should be evaluated by the authorized person and/or registered structural engineer appointed for the project as mentioned above.

8. Should you have any further queries to the above, please feel free to contact the undersigned or Mr. T.C. Kan of this office at phone no. 2626 1583.

Yours faithfully,

(K.S. Chang)
Technical Secretary/Structural
for Building Authority

tck/

**Attn.** **: To whom it may concern**

Date : 27 October 2005
Ref. : LE/026/AC/05

**Subject** **: Hilti HVU Adhesive Capsule**

Dear Sirs / Madams,

Enclosed please find the information of Hilti HVU Adhesive Capsule

| | |
|---|---|
| Brand Name | : Hilti |
| Model Name | : Hilti HVU |
| Manufacturer | : Hilti Corporation |
| Address of Manufacturer | : FL-9494, Principality of Liechtenstein. |
| Supplier | : Hilti (Hong Kong) Ltd |
| Address of Supplier | : 17/F, Tower 6, China Hong Kong City, 33 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong. |
| Country of Origin | : Germany |
| Name of Factory | : Hilti GmbH Ind. Ges. F. Befestigungstechnik |
| Address of Factory | : Hiltistrasse 6, D-86916 Kaufering, Germany |

Should you have further questions, please do not hesitate to contact our Technical Representatives or Customer Service Hotline at 8228-8118.

Yours sincerely,
Hilti (Hong Kong) Ltd.

Thomas Choy
Marketing Manager

**Hilti (Hong Kong) Limited**
17/F I Tower 6 I China Hong Kong City
33 Canton Road I Tsim Sha Tsui
Kowloon I Hong Kong
**P** +852-8228 8118 I **F** +852-2954 1751
**www.hk.hilti.com**

**Attn.** **: To whom it may concern**

Date : 12 January 2009
Ref. : LE/337/TC/09

**Subject** **: Hilti HAS-E Anchor Rod**

Dear Sirs / Madams,

Enclosed please find the information of Hilti HAS-E Anchor Rod.

| | |
|---|---|
| Brand Name | : Hilti |
| Model Name | : Hilti HAS-E / HAS-EF / HAS-ER |
| Manufacturer | : Hilti Corporation |
| Address of Manufacturer | : FL-9494, Principality of Liechtenstein. |
| Supplier | : Hilti (Hong Kong) Ltd |
| Address of Supplier | : 17/F, Tower 6, China Hong Kong City, 33 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong. |
| Country of Origin | : China |
| Name of Factory | : Hilti (China Zhangjiang) Co. Ltd. |
| Address of Factory | : Yongping Road South, Zhangjiang Development Zone, 524022 Zhangjiang, Guangdong Province, China |

Should you have further questions, please do not hesitate to contact our Technical Representatives or Customer Service Hotline at 8228-8118.

Yours sincerely,
Hilti (Hong Kong) Ltd.

Thomas Choy
Marketing Manager

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**www.hk.hilti.com**

**Attn.** **: To whom it may concern**

Date : 12 January 2009
Ref. : LE/338/TC/09

**Subject** **: Hilti HIS-N Anchor Sleeve**

Dear Sirs / Madams,

Enclosed please find the information of Hilti HIS-N Anchor Sleeve.

| | |
|---|---|
| Brand Name | : Hilti |
| Model Name | : Hilti HIS-N / HIS-RN |
| Manufacturer | : Hilti Corporation |
| Address of Manufacturer | : FL-9494, Principality of Liechtenstein. |
| Supplier | : Hilti (Hong Kong) Ltd |
| Address of Supplier | : 17/F, Tower 6, China Hong Kong City, 33 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong. |
| Country of Origin | : China |
| Name of Factory | : Hilti (China Zhangjiang) Co. Ltd. |
| Address of Factory | : Yongping Road South, Zhangjiang Development Zone, 524022 Zhangjiang, Guangdong Province, China |

Should you have further questions, please do not hesitate to contact our Technical Representatives or Customer Service Hotline at 8228-8118.

Yours sincerely,
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Thomas Choy
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Kowloon I Hong Kong
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**www.hk.hilti.com**

**Company:** Hilti

Telefon: Telefax:

**Product name: Hilti HVU M8 x 80 to M39 x 360**

Date of revision: July 24, 2000 Replaces edition of: March 31, 2000

## 1. Chemical product and company identification

**Product name:** Hilti HVU

**Manufacturer:** Hilti GmbH, Industriegesellschaft für Befestigungstechnik
Hiltistraße 6, D-86916 Kaufering
**Importer:** Hilti

Telefon:
Fax:

**Emergency telephone number:**

## 2. Composition / Information on constituents

**Chemical composition:** Adhesive anchor, contains urethane methacrylate resin with reactive diluent, dibenzoyl peroxide, phlegmatized

**Constituents:**

| | | CAS-No. | |
|---|---|---|---|
| < 10 % | hydroxypropyl methacrylate | 27 813-02-1 | Xi; R36, R43 |
| < 2% | dibenzoyl peroxide | 94-36-0 | Xi; R36, R43 |

## 3. Hazard identification

Constituents of the product HVU are irritant for eyes and skin. Skin contact may cause sensitisation**.**

## 4. First-aid measures

**Eyes:** Immediately flush with plenty of water for at least 15 minutes. Get medical advice.
**Skin:** Remove contaminated clothing. Wash skin with soap and water.
**Inhalation:** On breathing in a large amount of vapour, get out into the fresh air. Seek medical advice, if necessary.
**Ingestion:** Immediately rinse mouth and then drink plenty of water. Seek medical advice.

**Company:** Hilti

Telefon: Telefax:

**Product name: Hilti HVU M8 x 80 to M39 x 360**

## 5. Fire-fighting measures

**Extinguishing media:**
suitable: carbon dioxide, dry chemical, foam, water spray
not to be used: --

**Special fire-fighting procedures:**
In a fire, toxic or irritating / caustic gas may be generated. Wear self-contained breathing apparatus and protective clothing.
Medical attention is necessary for symptoms which obviously come from inhaling combustion fumes.

**Hazardous combustion products:**
COx, NOx, water, carbon

## 6. Accidental release measures

**Personal precautions:**
Remove ignition sources. Ensure adequate ventilation or self-contained breathing apparatus. Avoid contact with eyes or skin.

**Environmental precautions:**
Keep away from drains, surface water, ground water and soil.

**Cleaning procedures:**
Take / clean up using mechanical means. Remove remainder with solvent and liquid-binding material.
Dispose of according to local regulations.

## 7. Handling and storage

### 7.1 Handling:
Observe expiry date.
Don’t use damaged capsules.

### 7.2 Storage:
Store in original packing in a cool (max. +25°C) and dark place.
Keep away from direct sunlight.

**Company:** Hilti

Telefon: Telefax:

**Product name: Hilti HVU M8 x 80 to M39 x 360**

## 8. Exposure control and personal protection

**Respiratory protection:** --
**Eye protection:** safety glasses
**Hand protection:** Suitable gloves with chemikalienbeständiger Teilbeschichtung z.B. Nitril-beschichtete Baumwollhandschuhe
**Other:** Protective clothing

**Industrial hygiene:**
Avoid contact with eyes and skin. Remove soiled or soaked clothing at once. On skin contact, clean with a mild cleanser (polyethylene glycole) then wash with soap and water. Use a protection-cream.

## 9. Physical and chemical properties

| | | |
|---|---|---|
| **Form:** | 2-component foil capsule with liquid and powder | |
| **Colour:** | component A (resin): yellowish liquid<br>component B (hardener): white powder | |
| **Odour:** | like ester | |
| **Changes in condition:** | component A: polymerisation > 110°C<br>component B: decomposition temperature dibenzoyl peroxide > 50°C | |
| **Density:** | | |
| Density [g/cm$^3$] (°C) | component A (resin): 1.1<br>component B (hardener): 1.3 (20) | |
| Bulk density [kg/cm$^3$] | component B: 0,6 | |
| **Vapour pressure [mbar] (°C)** | component A: <0,1 (HPMA) (20) | |
| **Viscosity:** | | |
| Viscosity [mPa×s] (°C) | component A:<300 (23) | DIN 53 015 |
| Efflux time 4 mm nozzle [s] | 22 (23) | DIN 53 211 |
| Efflux time 8 mm nozzle [s] | --- | |
| **Solubility [g/l] (°C):** | | |
| in water | component A : 107 (HPMA) (25)<br>component B : insoluble | |
| **pH value ( g/l $H_2O$;°C):** | not applicable | |

**Company:** Hilti

Telefon: Telefax:

**Product name: Hilti HVU M8 x 80 to M39 x 360**

| | | |
|---|---|---|
| **Flash point [°C]:** | component A: >100 | DIN 53 213 |
| **Ignition temperature [°C]:** | not determined | DIN 51 794 |
| **Explosive limit [vol%]:** | | |
| lower: | not determined | |
| upper: | not determined | |
| **Thermic decomposition [°C]** | component B: above +50°C beginning of decomposition | |
| **Autoignition temperature [°C]:** | The product is not self igniting. | ASTM D 2155 |

## 10. Stability and reactivity

**Conditions to avoid:**
- At storage temperatures above 30°C, dibenzoyl peroxide in component B decomposes / degrades and the resulting carbon dioxide make the capsule swell.
- Exposure to direct sunlight can cause the resin to polymerise.
This makes the adhesive anchor unusable.

**Materials to avoid:**
None

**Hazardous decomposition products:**
None, if used for the intended purpose.

## 11. Toxicological information

The classification takes place according to the determination process in 88/379/EEC.
On local contact, there can be irritation of the eyes, skin and mucous membranes.
Sensitization is possible on contact with the skin.

## 12. Ecological / environmental information

Keep away from drains, surface water, ground water and soil.
Class of risk for water: 2.

**Company:** Hilti

Telefon: Telefax:

**Product name: Hilti HVU M8 x 80 to M39 x 360**

## 13. Disposal considerations

Foil capsules that have become unusable, e.g. expiry date exceeded must be disposed of as special waste in accordance with legislation.

**Type of waste:**
On handing over small amounts to communal collection points: EAK no. 20 01 12
(adhesives and synthetic resins)
Disposal of large quantities via disposal companies: EAK no. 08 04 02
(old adhesives and sealants containing no halogenated solvents.

## 14. Transport information

| | |
|---|---|
| **Road transport** GGVS/ADR | - - |
| **Rail transport** GGVE/RID | - - |
| **Technical designation:** | - - |
| **Ocean transport** GGVSee/IMDG | - - |
| **Supplement for maritime traffic:** | - - |
| **Air transport** IATA-DGR | - - |
| | **Not dangerous good in the meaning of the above regulations.** |

## 15. Regulatory information

Classification according to 67/548 EEC and 88/379 EEC directives and to their supplements.
HVU is an irritant preparation.
Observe the precautionary measures usual when handling chemicals.

**Labelling:**

Symbols:

**Danger identification** Xi, irritant

Contains: dibenzoyl peroxide
hydroxypropyl methacrylate

**Company:** Hilti

Telefon: Telefax:

**Product name: Hilti HVU M8 x 80 to M39 x 360**

**Risk phrases:**

| | |
|---|---|
| R36 | Irritating to eyes. |
| R43 | May cause sensitization by skin contact. |

**Safety phrases:**

| | |
|---|---|
| S3 | Keep in a cool place. |
| S37/39 | Wear suitable gloves and eye protection. |
| S26 | In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. |
| S28 | After contact with skin, wash immediately with plenty of soap and water. |

**Further information:** Classification as per VbF (D): not assumed

Observe Council Directive 94/33/EC of 22 June 1994 on the protection of young people at work § 2 and / or
(DE) Jugendschutzgesetz § 22, § 29

## 16. Other information

Body issuing data sheet:
Hilti Entwicklung Elektrowerkzeuge GmbH
Hiltistrasse 26 D-86916 Kaufering Tel: 08191 906310

All information and recommendations contained herein are based on data believed to be correct. However, no guarantee or warranty of any kind expressed or implied is made with respect to the information provided.

| Date | Project Name | Contractor | Application |
|---|---|---|---|
| | | **Project Type:ASD** | |
| 2011 | Tamar Development | CREATIVE FACADE ENGINEERING LTD | Fixing on steel structural |
| 2011 | Tamar Development | GAMMON - HIP HING JOINT VENTURE | Signage fixing |
| 2011 | Tamar Development | HOP HING CONSTRUCTION & | Fixing on steel structural |
| 2012 | Kai Tak Development | WING KEI STRUCTURAL METALWORKS CO | Steel beam/bracket fixing |
| | | **Project Type:Buildings** | |
| 2013 | Ha Ko Po Village | SIMBEL LTD | Stone cladding fixing |
| | | **Project Type:HKAA** | |
| 2011 | Airport Development 機場主要發展 | LOEDIGE ASIA LIMITED | Machine/Equipment fixng |
| 2011 | Airport Development 機場主要發展 | WAH TUNG METAL ENG CO LTD | Safety system fixing |
| 2011 | Airport Development 機場主要發展 | WING HING CONSTRUCTION CO LTD | Metal gate fixing |
| 2011 | Airport Development 機場主要發展 | WING MING ENG (HK) LTD | Road barrier fixing |
| 2012 | Airport Development 機場主要發展 | LOEDIGE ASIA LIMITED | Gondola fixing |
| 2012 | Airport Development 機場主要發展 | LOEDIGE ASIA LIMITED | Machine/Equipment fixng |
| 2012 | Airport Development 機場主要發展 | SIEMENS LTD | Electrical services fixing |
| 2013 | Airport Development 機場主要發展 | AA | Machine/Equipment fixng |
| 2013 | Airport Development 機場主要發展 | EAST GAIN METAL WORKS ENG LTD. | Hand rail fixing |
| 2014 | Airport Development 機場主要發展 | AA | Machine/Equipment fixng |
| 2014 | Airport Development 機場主要發展 | GAMMON | Safety system fixing |
| 2015 | Airport Development 機場主要發展 | GAMMON | Safety system fixing |
| | | **Project Type:Macau - Casino & Hotel** | |
| 2014 | Macao Studio City 星麗門 | Paul Y & Yau Lee JV | Underwater fixing |
| 2014 | Windsor Arch 名門世家 | Great Harvest | Balustrade fixing |
| 2014 | Wynn Palace 永利皇宮 | Leighton | Plumbing & drainage fixing |
| 2015 | Windsor Arch 名門世家 | Great Harvest | Balustrade fixing |
| 2015 | Windsor Arch 名門世家 | Great Harvest | Others |
| | | **Project Type:Others** | |
| 2011 | DISNEYLAND | KIN WIN ENGINEERING LTD | Plumbing & drainage fixing |
| 2011 | Ocean Park Development | HANG KEI ENGINEERING SERVICE LTD | Electrical services fixing |
| 2013 | Poly-U Redevelopment | | Interior finishings fixing |
| 2013 | Poly-U Redevelopment | FOU YING ENGINEERING CO LTD | Interior finishings fixing |
| | | **Project Type:Railway** | |
| 2011 | Tuen Mun Station Development (TMTL 447) | HOP KEE (KAM FAI) ENG CO LTD | Steel beam/bracket fixing |
| 2012 | Tuen Mun Station Development (TMTL 447) | BOTH ARTS ENG CO | Block work gap sealing |

| Date | Project Name | Contractor | Application |
|---|---|---|---|
| 2012 | Tuen Mun Station Development (TMTL 447) | BOTH ARTS ENG CO | Roofing fixing |
| 2012 | Tuen Mun Station Development (TMTL 447) | TAT SHING CONSTRUCTION | Steel beam/bracket fixing |