

| HAP 1.15 Hoist Anchor Plate | Benefits |
|---|--|
|  | <ul style="list-style-type: none"> • No limitation in load direction, hook (shackle) can rotate and swivel, symmetric design of base plate with 4 anchors • Design fits application requirements of vibratory dynamic loads from motorized hoisting with dynamic safety factor of 1.8 • Anchorage of hoist point can be designed with PROFIS Anchor software, cracked and uncracked concrete, \geq C20/25 • Recommended anchors: HST3 M12 ($h_{ef}=70\text{mm}$) or KB-TZ $\frac{1}{2}$" ($h_{ef}=3\frac{1}{4}$"") • Two or more HAP 1.15 can be combined to increase total WLL • Delivered pre-assembled (one piece), no need for assembly • Compact design, only 155 x 155 x 52 mm (when shackle is folded to plate) • Global safety factor of 4 for all steel connections |

Applications

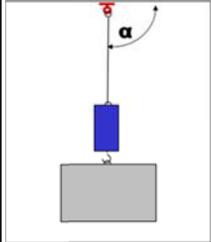
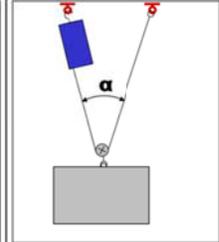
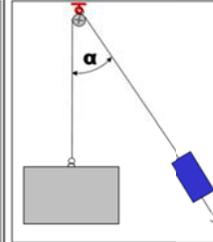
The HAP 1.15 is designed for temporary and permanent application under dry indoor conditions, to be used as post installed “master hoist point” for installation and/or maintenance in elevator shafts. It can be used with manual or motor hoists and bears a working load up to 1.15 metric tons in variable directions.

Basic loading data

Data for WLL_{total} applies to

- Correct design of anchorage (see “design of anchorage”)
- Correct setting of anchors
- No edge distance influence
- Cracked concrete, C20/25, $f_{ck,cube} = 25 \text{ N/mm}^2$
- Cracked concrete, ACI 318-14 design (cylindrical test method): $f'_c = 2500 \text{ psi}$
- No shock loading; vibratory dynamic safety factor γ_{dyn} up to 1.8

HAP 1.15 Hoist Anchor Plate, single and multipoint loads

| | | | Single Point | Single Pulley ^{a)} | Fixed motor hoist |
|---|----------------------|--------------|--|---|---|
| | | |  |  |  |
| Anchor system Working Load Limitation (WLL) | | | | | |
| $\alpha < 20^\circ$ | WLL _{total} | [metric ton] | 1,15 | 2,25 | 0,55 |
| $20^\circ < \alpha < 45^\circ$ | WLL _{total} | [metric ton] | 1,15 | 2,1 | 0,5 |
| $45^\circ < \alpha < 60^\circ$ | WLL _{total} | [metric ton] | 1,15 | 2,0 | 0,45 |
| $60^\circ < \alpha < 90^\circ$ | WLL _{total} | [metric ton] | 1,15 | 1,6 | 0,4 |
| $90^\circ < \alpha < 120^\circ$ | WLL _{total} | [metric ton] | Not applicable | 1,15 | Not applicable |

a)Keep distance of min. 4 x h_{ef} between anchors of the two HAPs

Design of anchorage

HAP 1.15 is designed to be used as hoist point for lifting loads under variable directions in elevator installation or maintenance.

The design of an anchorage for the HAP 1.15 must account for varying load conditions (varying directions, dynamic effects, etc.) For this the anchorage for HAP 1.15 has to be designed according to extreme load cases: A concrete anchor can only be considered as suitable for use with the HAP 1.15 hoist point if the approved anchor satisfies ALL of the following load scenarios (e.g. by PROFIS calculation¹) with ETAG or ICC calculation method:

ETAG design

Conditions:

- Base material: acc. to onsite conditions
- Cracked or uncracked concrete
- Slab thickness: onsite slab thickness²
- Dimensions of baseplate see picture
- Partial safety factor for load $\gamma_L = 1.8$

Load scenario 1 (pure tension):

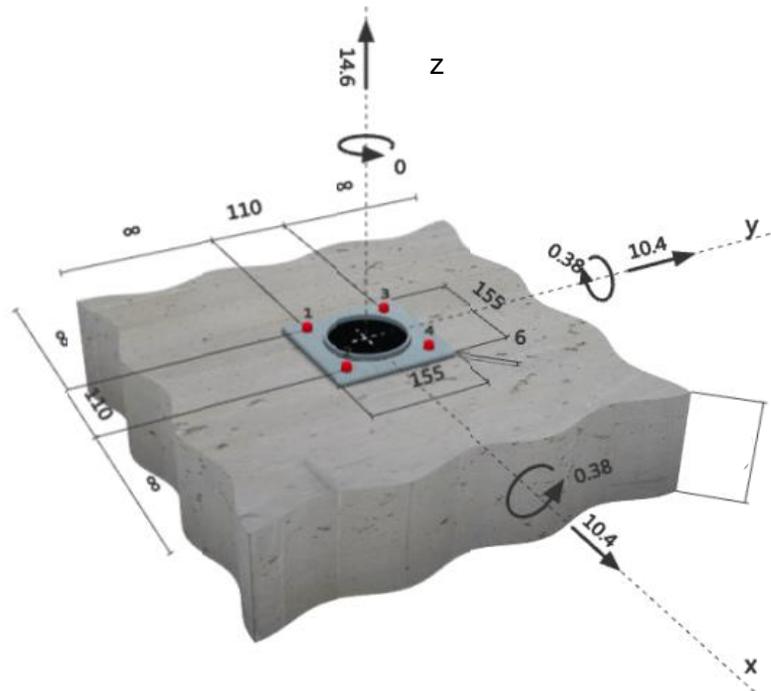
| | |
|-------|---------|
| F_z | 20.7 kN |
|-------|---------|

Load scenario 2 (diagonal 45°):

| | |
|-------|----------|
| F_z | 14.6 kN |
| F_x | 10.4 kN |
| F_y | 10.4 kN |
| M_x | 0.38 kNm |
| M_y | 0.38 kNm |

Load scenario 3 (diagonal shear):

| | |
|-------|----------|
| F_x | 14.6 kN |
| F_y | 14.6 kN |
| M_x | 0.54 kNm |
| M_y | 0.54 kNm |



Load scenario 2

For use of HAP 1.15 as ETAG approved anchorage, Hilti recommends use of HST3 M12

¹Free download of PROFIS Anchor design software from www.hilti.com Service & Support

² Minimum slab thickness according to tech. data of applied anchors

ICC Design (ACI 318-14, Chapter 17)

Conditions:

- Base material: acc. to onsite conditions
- Cracked or uncracked concrete
- Slab thickness: onsite slab thickness³
- Dimensions of baseplate see picture
- Partial safety factor for load $\gamma_L = 1.8$

Load scenario 1 (pure tension):

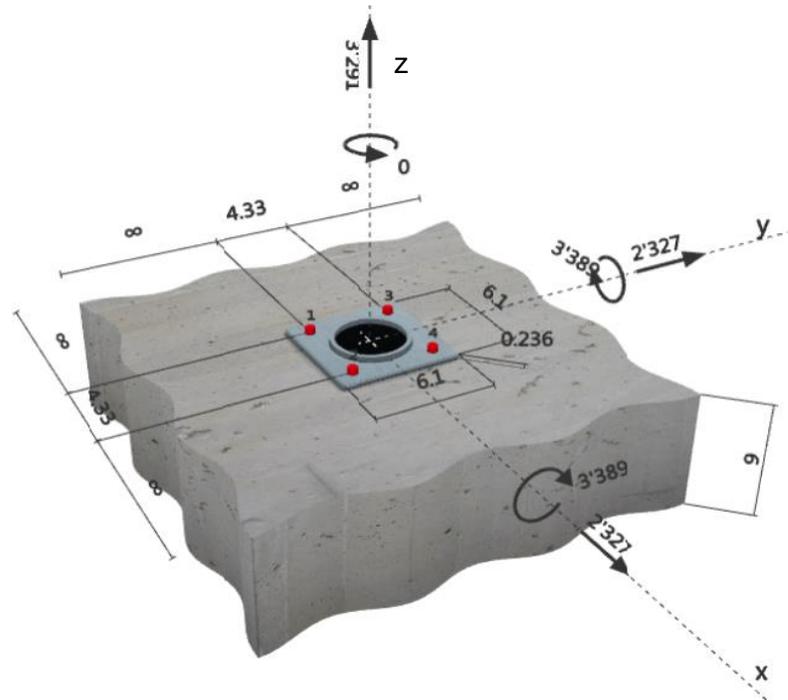
| | | |
|----------------|------|-----|
| F _z | 4654 | lbf |
|----------------|------|-----|

Load scenario 2 (diagonal 45°):

| | | |
|----------------|------|---------|
| F _z | 3291 | lbf |
| F _x | 2327 | lbf |
| F _y | 2327 | lbf |
| M _x | 3389 | in~ lbf |
| M _y | 3389 | in~ lbf |

Load scenario 3 (diagonal shear):

| | | |
|----------------|------|---------|
| F _x | 3291 | lbf |
| F _y | 3291 | lbf |
| M _x | 4793 | in~ lbf |
| M _y | 4793 | in~ lbf |



Load scenario 2

For use of HAP 1.15 as ICC approved anchorage (WLL = 2585 lbf), Hilti recommends KB-TZ 1/2 x 3 1/4".

³ Minimum slab thickness according to tech. data of applied anchors

Onsite Qualification

Hilti recommends to proof load the installed HAP 1.15 each time after the hoist equipment is installed, adjusted, or changed.

Test procedure (shown with Hilti Anchor Tester HAT 30)

This procedure will verify the fastening capacity of the anchorage and the base material for HAP 1.15 use.

1. Make sure anchors for the HAP 1.15 are correctly installed. Make sure shackle is not attached (de-install shackle if necessary). Connect ring bolt adapter of HAT 30 to center bolt.



2. Connect HAT 30 with ring bolt adapter and position the tester with edges of tester baseplate parallel to edges of HAP plate.



Turn crank in clockwise direction until legs are in contact with the base material.

Check that pullout force acts parallel to the axis of the anchors and parallel to the legs of the HAT 30 and HAP 1.15 is centered with HAT 30.

3. Set the red hand of the gauge to zero.



4. Hold the HAT 30 by the grip while increasing the load on the HAP 1.15 by turning the crank in a clockwise direction. Increase the load until proof load of 26.5 kN is attained.



5. Keep the proof load on HAP 1.15 for at least 5 minutes.

6. Check the load on the HAT 30 after 5 minutes (black hand) and note down the difference to the initially applied proof load (red hand).

Release the load by turning the crank counterclockwise.



7. Remove HAT 30 and ring bolt adapter.

Perform visual check on HAP 1.15 and base material (damages, deformations, cracks).

The Hoist Anchor Kit has passed the test and can be loaded with a maximal working load of 1.15 metric tons if the following requirements are met:

- The applied proof load of 26.5 kN decreased less than 10% during the 5 minutes test duration
- No damage or deformation of the HAP 1.15
- No damage (e.g. cracks) in the base material

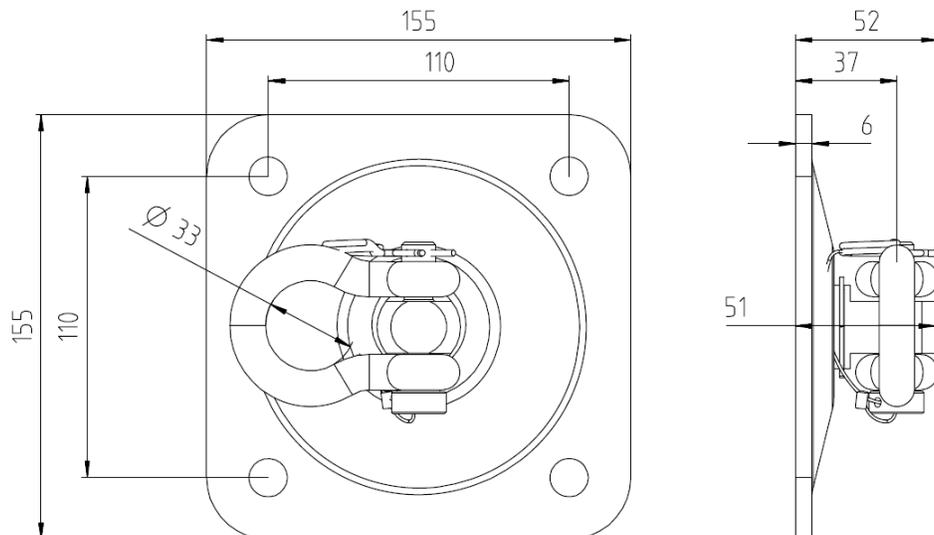


8. Install the shackle and plug in the safety pin, optional is to mark or label the HAP 1.15 with date of proof loading, name of testing person

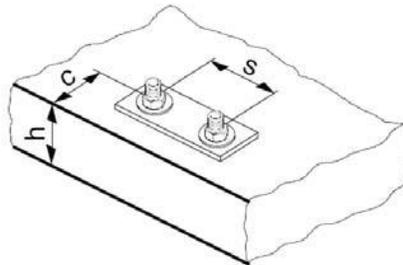
Materials

| Part | Material / Mechanical properties or standard |
|------------------|---|
| Shackle axis | Galvanized steel $R_m > 550\text{N/mm}^2$ |
| Shackle (U-bolt) | Material, functional dimensions and mech. properties acc. to EN 13889, coated with 100my powder laque |
| Eye Bolt | Galvanized steel $R_m > 550\text{N/mm}^2$ |
| Base plate | Galvanized steel $R_m > 355\text{N/mm}^2$ |

Base material thickness and anchor spacing



| HAP 1.15 | | |
|---------------------------------|-----------------|--|
| Minimum base material thickness | h_{\min} [mm] | according to technical data of applied anchors |
| Spacing (Hoist Anchor Plate) | s [mm] | 110 |
| Edge distance | c [mm] | according to technical data of applied anchors ^{a)} |



^{a)} For smaller edge distances the design loads have to be reduced (see ETAG 001, Annex C).

Setting instructions

