Hilti system solutions for elevators

THE EFFICIENT WAY UP.

Well-thought-out solutions.

We have solutions for the fastening and installation tasks you carry out daily – on virtually every material including concrete, masonry and steel.

Productivity
Our innovative products and systems have a proven track record. They speed up the job and let you work more productively.

Reliability
A continuously expanding library of approvals, appraisals and test reports takes the reliability of our products to another level. Our experience, the advice we provide, and the software solutions we offer make us a partner you can rely on.

Health and safety
We care about our customers. That’s why effective health and safety measures and the prevention of accidents have been fundamental to our company for many years.

Hilti account managers
Two-thirds of all Hilti employees are in daily contact with our customers. This means through the Hilti group, a total of 200,000 contacts every working day with customers worldwide. We support them by providing advice and know-how.
Contents

Elevator shaft evaluation .................................................. 4
Modernization ................................................................. 6
Rail anchoring systems ..................................................... 8
Rail installation systems ................................................... 10
Elevator shaft door installation .......................................... 12
Scaffold-free installation .................................................. 14
Finding rebar before drilling anchor holes ......................... 16
Cordless systems ............................................................ 18
Services best suited to your needs ..................................... 20
Engineering ................................................................. 22
Elevator shaft evaluation

Assessing the site of the installation before delivery of elevator components.

Your challenges

• Evaluation is a time-consuming process, especially in situations where an existing elevator installation is to be modernized
• Checking the verticality of elevator shaft walls
• Checking the squareness of the shaft cross section
• Checking the alignment of door openings
• Checking the dimensions of door openings
• Checking the level of doors on opposite sides of the shaft
• Checking the alignment of installed guide rails
Hilti system solutions for elevators

**Tools for efficient installation**
- Compact measuring accessories for easy alignment
- Height-adjustable tripods for maximum accuracy
- Practical accessories for a wide range of measuring and alignment applications
- Laser remote control and receiver for locating the laser beam easily and accurately

**Laser range meters PD5/PD-E**
- **Advantages**
  - Compact and easy to use
  - Makes measuring a one-person job
  - Memory and calculation functions for the distances measured (PD-E)
  - Timer for delayed-action measurements in inaccessible places using the extension rod PDA 72 (PD-E)
  - Advanced functions for indirect measurements when access is limited
  - Built-in inclination sensor and targeting sight for long distances (PD-E)
- **Features and characteristics**
  - Accuracy: ± 0.03 in at 33 ft
  - Battery life: up to 25 hours via rechargeable Li-Ion battery packs
- **Accessories**
  - Tripod for setting up the laser at the desired height above floor level
  - Wall-mount and accessories for use in vertical orientation

**Combilaser PMC 46**
- **Advantages**
  - Self-leveling plumb reference
  - Three laser points at right angles to each other for checking the squareness and verticality of the shaft
  - Projects vertical and horizontal reference lines on the walls of the shaft
  - Easy to use by one person
  - Setting up in the shaft requires no auxiliary structures
- **Features and characteristics**
  - Accuracy: ± 0.08 in at 33 ft
  - Uses standard, commercially available batteries
  - Leveling mechanism features highly efficient shock absorption for resistance to impacts
- **Accessories**
  - Target plate for improved plumb point visibility in bright light at door openings

**Rotating laser PR30-HVS**
- **Advantages**
  - Horizontal or vertical alignment
  - One function per button operation makes for quick, easy tool use
  - Large laser receiver window for quick location of the laser beam
  - Laser plane auto-alignment function, for increased productivity and higher accuracy
  - Capabilities to perform slopes via entry of digital values directly
- **Features and characteristics**
  - Accuracy: ± 0.03 in at 33 ft
  - Uses standard, commercially available batteries
  - Leveling mechanism features highly efficient shock absorption for resistance to impacts
- **Accessories**
  - Tripod for setting up the laser at the desired height above floor level
  - Wall-mount and accessories for use in vertical orientation

**Checking the verticality of elevator shaft walls**

**Checking the alignment of door openings**

**Easy, accurate distance measurement**
Modernization

Modernization of an existing elevator shaft with components fastened to old masonry.

Your challenges

• Old guide rails are often left in the shaft to avoid having to set new anchors in the old masonry
• Special brackets or supports are used to attach new guide rails to the existing anchors
• Lack of knowledge of the old, existing base material can make selection and installation of new anchors challenging
• Increased safety risk due to use of existing roof anchor points not known to be reliable
• Installation of incorrectly dimensioned hoist anchor points on the shaft roof without verified static or dynamic loading capacity
Advantages
• The index pointer allows identification of anchor creep, i.e. slow anchor failure
• A report can serve as proof of verified, tested anchorage for technical acceptance inspections
• Suitable for testing hoist anchors (rings) and anchors with various head shapes and diameters

Features and characteristics
• Max. test load: 30kN (6744 lbf)
• The tool requires no electric power and can be used by a single person
• Certified by VdTÜV for the installation of rail fastenings in compliance with the Elevator 104 code of practice

Accessories
• Calibration service with certificate

Advantages
• Temporary anchor point on concrete for chain hoists or other lifting equipment
• Optimized reliability through use of four KB-TZ expansion anchors with ICC-ES approval for tension zone (cracked concrete) and seismic
• 1/2” diameter anchor holes required – same as for most other elevator rail fastenings
• The ring can be rotated through 360° and pivoted up to 180°
• Suitable for ceiling or wall installation

Features and characteristics
• Working load limit of up to 1.15 t for hoisting components

Accessories
• Base plate anchorage can be tested with the HAT 28 tester

Advantages
• Very easy-to-use chemical anchor system
• More than 20 years of Hilti experience in the field of chemical anchors
• Fast curing time provides full load capacity after 30 minutes at 68°F
• Virtually odorless and easy to dispense (little pressure required)

Features and characteristics
• ICC-ES approved system for hollow and grout-filled concrete masonry units and hollow brick masonry walls (ESR-2682)
• Certified by VdTÜV for the installation of rail fastenings in compliance with the Elevator 104 code of practice

Accessories
• Wide range of suitable anchor rods and internally threaded inserts in different lengths and materials
• Manual and cordless electric mortar dispensers

Tools for efficient installation
Cordless rotary hammer drills for high performance and run time
Drill bits perfectly matched to Hilti tools for maximum performance and productivity
Cordless dispensers for quick, effortless and accurate injection
Cordless flashlights with LED and two years coverage wear and tear

Injectable mortar HIT-HY 70

Loading capacity testing of roof hooks and anchors

Anchor testing system HAT 28

Installing hoist anchor points

Hoist anchor kit HAP 1.15

Setting anchors in masonry

Injectable mortar HIT-HY 70
Rail anchoring systems

Brackets with elongated holes are used to anchor guide rails to the shaft walls in precise alignment.

Your challenges

• Elongated holes in rail anchor brackets reduce the contact surface area for standard washers and nuts
• Risk of drilling through thin shaft walls
• Drilling into reinforcing bars causes oblique holes resulting in high bending moments on anchors
• Little space for tapping in stud anchors with a hammer
• Drilling anchor holes generates a lot of dust in the shaft, presenting a health hazard to workers
• Achievement of adequate loading capacity at low anchorage depth
### Anchoring brackets securely

**KWIK Bolt expansion anchors**

**Advantages**
- Best in class performance and ICC-ES approvals for safety and reliability
- Tough cold-formed steel for high ductility, and performance
- KWIK Bolt TZ with pre-assembled nut and washer
- High load values even at shallow embeddings reduce the drilling effort to a minimum
- Close edge distance and spacing support design of narrow rail brackets and door sill installation in thin ceiling slabs without load reduction

**Features and characteristics**
- ICC-ES reports: KWIK Bolt TZ: ESR-1917 (cracked concrete, seismic)
- KWIK Bolt 3: ESR-2302 (uncracked concrete), ESR-1385 (masonry)

### Installing the anchor

**Cordless rotary hammer drill TE4-A18**

**Advantages**
- High working safety thanks to ergonomic design and lack of extension cord
- Compact, lightweight tool for efficient drilling in concrete up to 5/8” diameter
- Capable of drilling through rebars up to 5/8” diameter when TE-CX drill bits are used

**Features and characteristics**
- Powerful 18V battery with long life expectancy and Li-ion technology
- Up to 30% longer lifetime than other rotary hammers

### Cast-in anchor channels for concrete

**Advantages**
- Optimum protection to help prevent channels filling with concrete slurry
- The same type of T-head bolt fits three different channel sizes
- Allows great flexibility for adjusting the position of the fastening point

**Features and characteristics**
- End caps at both ends of the channel
- Easily removable foam insert with gripping tab
- Suitable for use under static and dynamic loading

### Tools for efficient installation

<table>
<thead>
<tr>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long lasting brushless motor</td>
</tr>
<tr>
<td>Cordless cut-off/grinders, keyless arbor and guard adjustments</td>
</tr>
<tr>
<td>Effective dust removal systems</td>
</tr>
<tr>
<td>for working virtually dustlessly</td>
</tr>
<tr>
<td>Drill bits perfectly matched to Hilti tools for maximum performance and productivity</td>
</tr>
<tr>
<td>Versatile T-head bolts for anchor channels of various sizes</td>
</tr>
</tbody>
</table>

---

Hilti system solutions for elevators
Rail installation systems

The guide rails for the elevator cars must be accurately aligned on the shaft walls and anchored between multiple elevator systems.

Your challenges

• The time-consuming job of releasing and tightening nuts and bolts when aligning guide rails
• The labor-intensive and awkward job of hanging plumb lines from the roof of the shaft to be used as a reference
• Handling heavy steel structures for the division of shafts, made to size and welded on site
• Tolerances in the dimensions of the building may make adaptation of shaft-dividing structures in the workshop necessary, resulting in time-consuming transport
Advantages
• Compared to hand tools, saves up to an hour of labor time when installing an elevator with five stops
• Generally no need to hold the heads of bolts when tightening nuts
• The user maintains a more secure stance as no physical compensation of torque is required

Features and characteristics
• High-performance 18V Li-ion cordless impact wrench, powerful enough for 5/8" bolts
• Long-life Li-Ion batteries are covered for unlimited battery replacements*

Accessories
• A full range of cordless tools operated with the same 18V battery
• Installer can define own 18V cordless combo by building own combo tools, batteries and charger in robust soft bag

Advantages
• The quick way to provide reference lines for rail alignment
• Supports the scaffold-free elevator installation process – no need to fasten to the roof of the shaft
• The laser beam levels and aligns itself automatically, even after the rail has been subjected to impacts
• Laser tools are suitable for a wide variety of tasks during shaft evaluation and in the installation process
• Ruggedly built, dustproof, water-resistant tools featuring leveling mechanisms with outstanding impact absorption

Features and characteristics
• Accuracy: ± 0.08 in at 33 ft
• Compact system in a Hilti toolbox
• Powered by standard, commercially available batteries

Accessories
• Software-aided design with Hilti PROFIS
• 100% compatible with the Hilti MQ and MI modular systems for medium and light loads

Tools for efficient installation

*See Hilti Lifetime service for details
Elevator shaft door installation

Elevator shaft doors must be installed at the height of the subsequently finished floor level and fastened at the sill and at the door-operating motor unit.

Your challenges

• Transferring the “3 ft above finished floor level” mark from the outside wall to the wall of the shaft
• Making the reference marks for door alignment with two people
• Mounting the supporting beam (made to size locally from plain steel) for the door head in situations where the elevator shaft has no front wall
• Adjustments often need to be made to the door-supporting beams due to building tolerances
• Aligning doors on opposite sides of the shaft
### Elevator door alignment

**Features and characteristics**
- Installation channels with toothed inner edges and toothed connectors for quick and secure temporary or permanent connections
- System components made from galvanized steel
- Can be combined with the Hilti MI systems for heavy and light loads

**Accessories**
- Various magnetic brackets and tripods allow for a variety of mounting and application options

**Advantages**
- Flexible compensation of building tolerances through the “telescopic” characteristics of the connectors
- Easy assembly using push-button connectors and bolts
- No on-site adjustments need to be made to supporting members thanks to adequate overlap in the push-button connections
- No welding necessary, only push-button connectors and bolts

---

### Installation of doors and entrances

**Features and characteristics**
- Easy to operate with only one button for all applications

**Accessories**
- Various magnetic brackets and tripods allow for a variety of mounting and application options

**Advantages**
- The laser lines can be projected on to the walls or from the floor to the ceiling simultaneously or individually for horizontal and vertical alignment
- Long, easily visible horizontal and vertical reference lines
- Green beam technology for up to four times higher visibility compared to a conventional red beam
- Can be set up very easily on a clamping bracket or tripod
- No need for bubble levels, plumb lines and marking pens

---

### Fastening conduit and duct

**Features and characteristics**
- Lightweight, perfectly-balanced, high-performance tool
- Uses collated fasteners
- 750 fastenings with a single gas cartridge, LED display shows remaining gas reserve
- Gas power only – no battery to be changed

**Advantages**
- Time-saving system for light-duty fastening without drilling – saves up to three hours during installation of a five-stop elevator
- Less dust and dirt in the elevator shaft
- Many different fasteners available for various types of cable installation
- Suitable for use on concrete, masonry and steel
- Quiet, odorless, low-maintenance gas-actuated tool

---

### Tools for efficient installation

| Adjustable tripods for accurate leveling and aligning | Practical accessories for a wide range of measuring applications | High-performance cordless drivers and wrenches with perfectly-matched accessories | Perfectly matching cable clips for direct fastening |
Scaffold-free installation

When the scaffold-free installation method is used, safety measures must be implemented to prevent people or objects from falling.

Your challenges

• The gap between the edge of the elevator car roof, used as a working platform, and the wall of the shaft is often more than 1 ft, making a safety railing mandatory
• In situations where several elevators are operated in parallel in a shaft, a safety railing must be installed to prevent persons falling into the neighboring shaft
• The safety railing has to be assembled on the spot as it is too bulky to be transported in one piece
• It has to be adjusted to fit the dimensions of the applicable shaft
• It has to be dismantled and removed after completion of the installation work
• For the safety of third parties, door openings in the shaft must be cordoned off while elevator installation or renovation is in progress
• Hoist anchor points on the shaft roof should be tested for reliability before loading
**Advantages**
- Assembly and disassembly without drilling or welding
- Modular, plug-together system with “telescopic” characteristics makes time-saving on-the-spot adjustments possible
- Can be reused after disassembly
- Lightweight through use of rigid, thin-gauge channels
- Toothed inner edges and special “push-button” connectors for quick temporary alignment that can be made secure later by tightening the nuts

**Features and characteristics**
- Software-aided design
- System components made from electrogalvanized steel
- Can be combined with the Hilti MI and MQ modular systems for heavy and light loads

**Tools for efficient installation**
- Long lasting brushless motor cordless cut-off/grinders, keyless arbor and guard adjustments
- High-performance abrasive cutting discs for virtually every job
- Saw blades for maximum productivity in a wide range of demanding applications
- Laser range meters for easy, accurate distance measurement

**Advantages**
- Simple, inexpensive means of installing safety barriers at door openings
- Can be easily removed and subsequently replaced when access to the shaft is required
- Suitable for installation on the inside or outside of the door opening
- Suitable for door openings of various widths thanks to “telescopic” characteristics

**Features and characteristics**
- Barriers for a door opening packed in a sturdy fabric bag
- Rigid, lightweight channels can be easily transported by hand to the applicable floor

**Accessories**
- Comprehensive MQ modular system

**Advantages**
- Cuts through elevator rails in seconds
- More than 50 cuts in MQ41 channel possible with one battery charge
- Weight of less than 4kg for best handling and ease of use
- Blade brake stops the blade in less than 0.5 sec for safety
- Effective chip collector for a cleaner working environment
- LED lamp built into the front section of the blade guard for shadowless illumination of the cutting line
- Cuts metal with little or no sparks

**Features and characteristics**
- Operates with 18V battery pack that operates a wide range of Hilti tools
- Very low noise level
- Max cutting depth up to 2-1/4” for thin material with a profile

**Accessories**
- Hilti metal sawing blades
Finding rebar before drilling anchor holes

Engineers often do not allow the drilling of anchor holes to prevent cutting structural rebar in the elevator wall. But the drilling of anchor holes cannot always be avoided, for example when a cast-in anchor channel is missing or has been misplaced.

Your challenges

• Avoid rebar hits when drilling anchor holes
• Show the engineer that rebar in the shaft wall was detected before drilling
• Detect location of rebar in shaft wall without damaging concrete
• Document where rebar has been located and where the anchor hole was drilled
• In critical cases provide documentation to discuss if rebar will be cut or damaged when drilling
**More insight fewer surprises**

**X-Scan system PS 1000**

**Advantages**
- Locates objects of various kinds in concrete structures up to depths of 18"*.
- Displays a clear, real-time 2D image directly on the Hilti PS 1000 display.
- Processed 2D and 3D plan view or cross-sectional images are displayed in color on the PSA 100 monitor unit for further on-the-spot evaluation of the data or printing.

**Features and characteristics**
- A compact, cordless pulse radar system consisting of scanner, monitor and PC software.
- Clearly interpretable color images of the objects concealed in concrete structures, allowing immediate analysis.

**Accessories**
- Monitor with soft case, battery pack and AC adapter.
- Battery charger.

**Economic inside insight**

**Multidetector PS 50**

**Advantages**
- Knowing where to drill helps avoid costly repairs, saves time and drill bits.
- Brings peace of mind in anchoring or coring applications when plans are no longer available, e.g. in renovation projects.
- Built-in display for easy location of objects detected plus indication of approximate embedment depth and type of material.
- Easy to use.
- Ergonomically designed, ruggedly built; shock, dust and water resistant.

**Features and characteristics**
- Compact and ergonomic detection tool.
- Scan depth up to 5-7/8"*.

**Accessories**
- Soft pouch toolbag.
- Hand strap.
- Marker pen.

**Get a visible handle on rebar**

**Ferroscan system PS 250**

**Advantages**
- Quick, easy scanning of large areas.
- Individual scans over lengths of up to 100’ at depths up to 7"*.
- Immediately viewable true image of reinforcement shown on the monitor.
- Cordless scanner for maximum freedom of movement.
- 8 hours of scanning operation from each battery charge.

**Features and characteristics**
- Data transfer from scanner by infrared link for monitor viewing.
- Professional data evaluation and management software.

**Accessories**
- PC software for evaluation and management of scan data.
- USB cable for transferring data to a PC.
- Headset for voice recording with playback on the monitor.

---

**Tools for efficient installation**

- Marker pen set for marking on any base material.
- PSA 100 Monitor for instant 2D/3D analysis on site.
- Systems available including a trolley for easy transport of the entire system.

*Depending on conditions. Consult Hilti for details.*
Hilti tools featuring Lithium Cordless Power Care open up new horizons. Experience performance on par with corded tools and uncompromising reliability with the greatest possible independence from extension cords.

Your challenges

• Corded tools require extension cords that cost time and money to use
• Extension cords can challenge the safety of your team
• Jumble of extension cords from several tools limits working efficiency
• Bending and twisting extension cords may lead to safety risks
• Avoidable costs and delays caused by regularly having to replace damaged extension cords
Wear and tear covered. Longer lasting tools, batteries and chargers.

Hilti cordless tools, batteries and chargers are designed for professionals. We make our cordless tools for professionals who are on the job every day. With this in mind, they are built to last longer. We are so confident in their performance, we cover wear and tear for two years, parts, postage and service, three years with our Fleet Management program.

Build your own combos. The innovative cordless concept.

Take advantage of the unique offering and create a comprehensive Hilti cordless tool platform according to your individual needs. The build-your-own-combo concept allows you to acquire individual tools, batteries or chargers when you need them. You are never forced to purchase predefined sets or to pay for and store additional batteries when you already have an ample supply. You may also select from one of two Hilti high-quality soft bags for transport and storage of your Hilti cordless tools and accessories.

Example: Hilti 18V cordless combo
What good are the most efficient tools to an elevator installer if the job has to be interrupted because of a breakdown?

**Services best suited to your needs.**

Outstanding services for a product lifetime.
The unique service package for those who prefer to own their tools.

Hilti tools are built to last. But even if a breakdown occurs, Hilti will take care of it. Quickly and professionally, completely free of charge for up to two years from date of purchase. After that we continue to prove the quality of our products by putting a limit on what a repair can cost – for as long as you continue using your Hilti tool. We even give you a lifetime manufacturer’s warranty against manufacturing defects. That’s not just reassuring to know, it’s unique in this industry.

**We manage your tools.**
So you can manage your business.*

With Hilti Fleet Management, a fixed monthly charge covers all tool, service and repair costs. That greatly simplifies your financial planning and takes a load of administrative work off your shoulders. There are no hidden costs. All tools in the Fleet are replaced at regular intervals with tools of the latest generation, thus helping to avoid costly downtime and ensuring compliance with the latest safety standards. The replacement of batteries deemed in non-working order is included in the monthly charge.

Hilti, Inc. (U.S.) 1-800-879-8000 www.us.hilti.com • en español 1-800-879-5000 Hilti • (Canada) Corp. 1-800-363-4458 www.hilti.ca

Hilti power accessories.
Right tool plus right accessory results in highest performance.

The Hilti Power Effect.
Superior system performance.

When developing system solutions, Hilti looks to optimize user performance by taking into consideration the tool, accessory, and fastener. They are tested together and perfectly matched with the goal of increased productivity. This ultimately allows the benefit of the Hilti Power Effect – exceptional system performance which adds up to much more than the sum of its parts. You can reach maximum performance when using Hilti tools in conjunction with Hilti accessories.

The Hilti choice.
A selection designed to deliver what you need.

We use a two-line approach for power tool inserts to meet all the application needs of our customers. One line is for more challenging applications, where superior performance is the most important factor, and the other line for more common applications where customer needs are universal. Ask your Hilti salesperson for the best fit for your primary applications.
Engineering

On-site efficiency and safety starts with correct planning and design. Top range elevators in particular are tailor-made to customer requirements.

Your challenges

• Traditional design often leads to expensive, over-engineered solutions
• Architects go to thinner concrete walls and concrete ceilings forcing anchoring in short holes and close to the edge
• Designing steel support structures in elevator shafts for fixing rails and doors is a time consuming job
• Inspection authorities often want to see a clear documentation of design
**Specification and design software.**
Minimize risks right at the planning stage.

Hilti software helps you achieve a high safety standard right at the earliest stages of your projects. This is done, for example, by simplifying the design process for safe and cost-efficient anchor systems for use in concrete in accordance with the applicable directives and guidelines, or by consulting with the field engineer to help design support structures for use in the elevator shaft. Free software updates are available online to keep your PC applications up to date.

**Advantages**
- Hilti provides training on the use and personal configuration of these PC applications
- Hilti also provides design support in the event of users experiencing difficulties in implementing projects with the software

**Cooperation with the CEDES Group.**

With a view to increasing our knowledge of the stresses on anchor systems used in the installation of elevators, Hilti cooperates closely with the CEDES Group, an innovative manufacturer of sensors for elevator installations. In the CEDES Group’s test tower in Switzerland, elevator guide rails have been anchored in place together with special load cells. The results of our tests at facilities such as this are put to use in cooperation with the VdTÜV (German Association of Inspection Agencies) in the preparation of codes of practice for fastening applications and the knowledge we gain is communicated at international technical conferences attended by representatives of the elevator industry (ELEVCON) or in technical journals (Elevator World). We also, of course, apply this knowledge in the development work we carry out together with key customers who are globally active in the elevator business.