



HOCHTIEF Heavy Duty Anchor Systems  
from 175 kN to 600 kN per Anchor

# Innovative solution for extraordinary forces

Subsequently providing reliable support for loads weighing several tons is a real challenge. For small to medium loads (60 kN) there are a wide range of dowels available, which are easy to use. Particularly when existing concrete constructions have to be retrofitted, up to now there has been no solution as simple compared with the patented HOCHTIEF Heavy Duty Anchor System. Using the HOCHTIEF process saves time, is economical and

reliable on construction sites or even in facilities which are already being used. For heavy loads a technically secure and precisely implementable method such as the HOCHTIEF Heavy Duty Anchor System is absolutely essential. This is because inappropriate anchoring poses a danger to life and limb, and can also cause great economic damage.



Using a reinforcement scanner to determine the existing reinforcement in the construction component.



Red markings indicate the position of the reinforcement. Avoiding damage to the reinforcement through drilling the core hole between the reinforcing rods.



Inserting the undercutting head into the core hole.



Checking the completed undercut with a special gauge.

## Retrofitting in facility construction with great use of force

Facilities increasingly have to be adapted to new technical developments and retrofitted. Whenever large facility components and machines have to be subsequently fixed in exact positions or where dynamic loads occur, the load carrying capacity of standard mounting systems is no longer sufficient—this is when the HOCHTIEF Heavy Duty Anchor comes into its own. It fulfills all these requirements and you can also use it to improve existing reinforcements which are too weak.

HOCHTIEF is responding to this growing demand and is now offering a unique type of heavy duty undercut anchor system.

A planned use of the HOCHTIEF system can also be economically efficient for new facilities if it is necessary to remain flexible with regard to the time schedule.



Introducing the anchor, which is exactly fixed into position on the erection expedient, into the bore hole.



Fixing the anchor through injecting mortar through the mounting system, using a special mortar pump.

## Details of the HOCHTIEF solution

The HOCHTIEF heavy duty undercut anchor system (HT-SHV) is a patented process which was developed for being able to subsequently introduce very high loads in concrete construction components. HOCHTIEF placed really great value on also creating a reliable anchor in the case of large cracks, for instance in the event of an earthquake. The HT-SHV system consists of cast anchors with positive engagement, which can be used for introducing strong forces into both the pressure zone and the cracked tension zone of concrete components. Compared with conventional dowel anchors the system is also characterized by its very favorable deformation behavior in an axial as well as in a lateral direction.

The HT-SHV system is available in two versions: the light version HT-SHV30c is suitable for construction component thicknesses from 400 mm and can introduce up to 175 kN (17.5 t) tension force per anchor to the concrete.

In the heavy version HT-SHV50s the permissible tensile load is 600 kN (60 t) for construction component thicknesses from 750 mm. Depending on the structural requirements in the construction, the anchors may be anchored at depths of several meters. The general approval by the building authorities Z-21.8-1920 for the HT-SHV30c was issued by the DIBt (the German approval body for construction products and types of construction). There are no limits placed on the HOCHTIEF system: it can be flexibly adjusted—also to cope with extraordinary construction boundary conditions. Hence prestressed anchors, for instance in the case of dynamic loads or anchors in rock, are possible.

# Application areas

HOCHTIEF Heavy Duty Anchors provide high-performance solutions, which are technically and economically viable. For instance, they are suitable for:

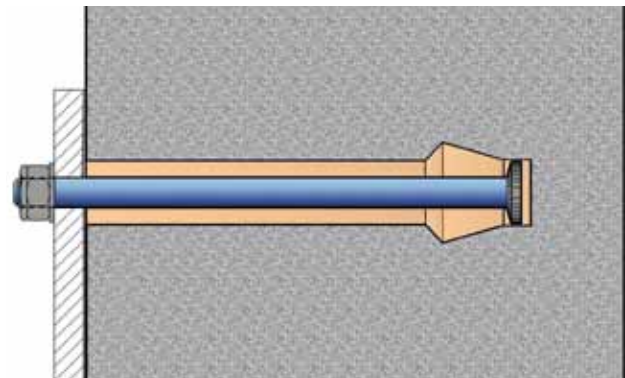
- subsequent fitting in existing concrete construction components with minimal influence on the respective components
- safe anchoring, also in the case of extreme loads, for instance earthquakes or explosions
- improvement and rehabilitation of existing constructions
- subsequent reinforcement connections for large diameters
- subsequent thrust reinforcement
- rapid and reliable retrofitting of facilities in heavy industry
- exchanging of load attachment points / transportation anchors in the case of repeated use (can be checked with ultrasonic systems)
- load attachment points in the case of dismantling large concrete demolition pieces



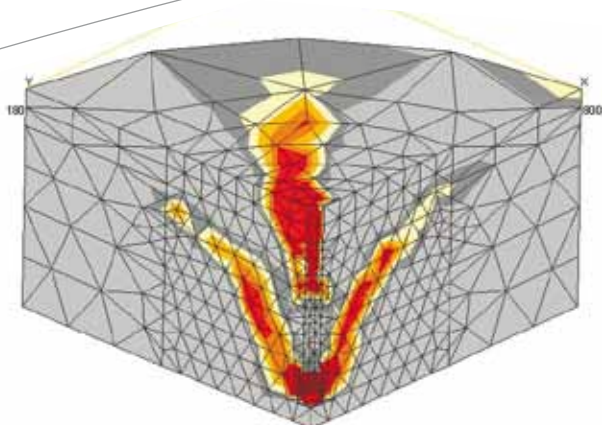
HOCHTIEF takes over all the construction work necessary for this, including planning with procedure of furnishing proof for structural requirements. We have already successfully fitted more than 2,000 anchors of different types for diverse purposes.

The following are some examples where the HT-SHV system has been very successfully used:

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|------------------------|--|
| Rolling mills:         | Coiler, edger, etc.  |
| Nuclear power station: | Component anchors also for earthquakes, exchange of load attachment points |
| Chemical plants:       | Steel silo towers  |
| Mining:                | Shaft towers   |
| Building construction: | High, free-standing stair towers   |
| Dismantling:           | Load attachment points for heavy demolition pieces                         |



Anchor in fitted state



The image of a non-linear FE simulation clearly illustrates the load application of the HT-SHV in the undercut section



Undercutting tools

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