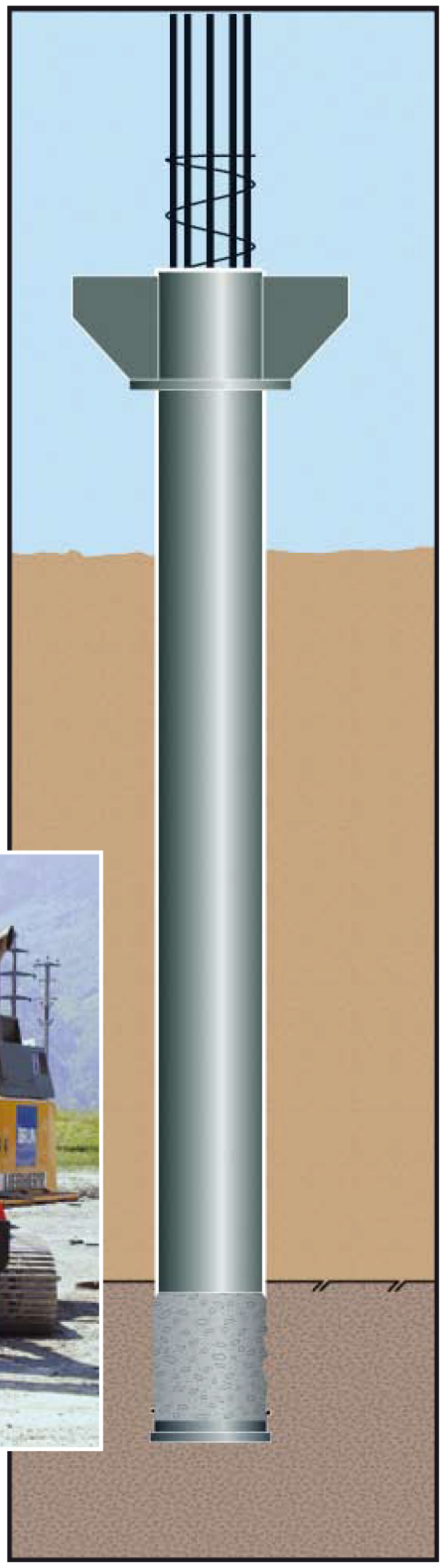
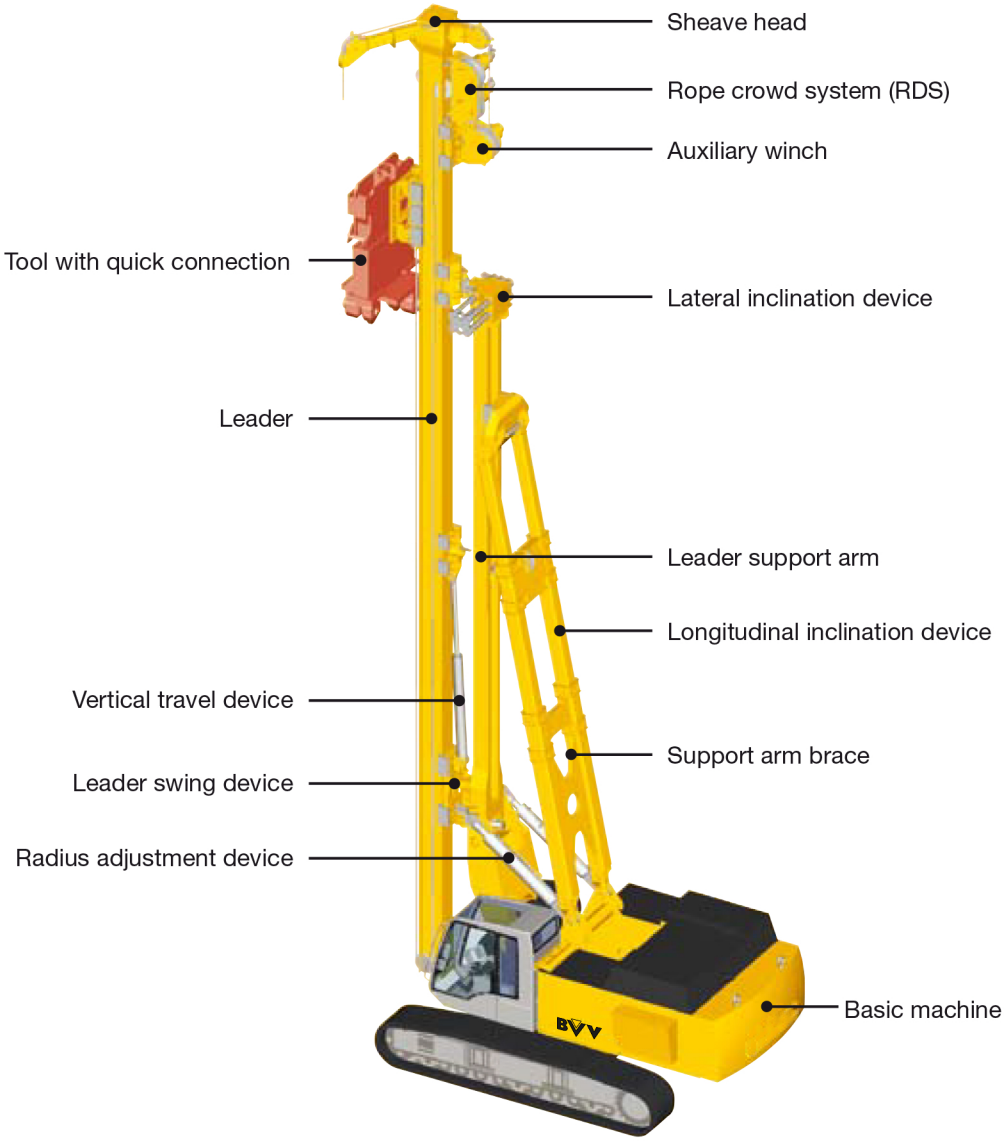
Vibrated cast-in-place pile installation process



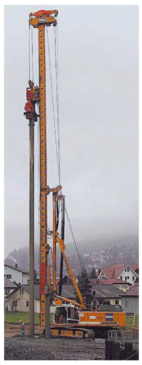
BVV

The ideal piling- and drilling rig



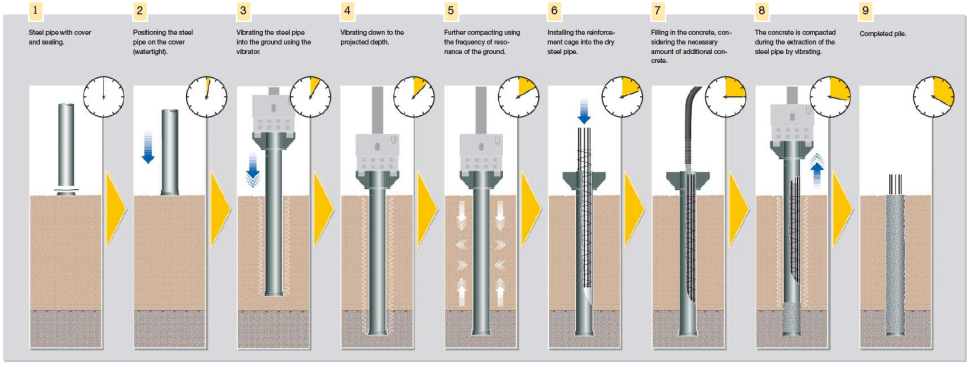
- High engine output with automatic engine speed control
- Controlled entirely from cab
- Sturdy and solid rig design
- Wide longitudinal and lateral supporting system on the basic machine through triangles
- High push and pull forces
- High torque
- Fast and easy assembly of leader extensions without auxiliary devices
- Completely self-rigging
- Large range of working tools (all piling and drilling works can be performed)
- Leader swing range +/- 90°
- Stepless inclination 1:4 forward – 1:1 backward depending on type of equipment
- Increase of effective length (3m) via vertical travel device
- Adjustment of lateral inclination independent from longitudinal inclination
- Automatic vertical alignment
- High alignment forces
- Simultaneous control of several movements via Load-sensing multi-circuit hydraulics
- Quick change of equipment possible through quick connection
- Equipment design according to latest European regulations and norms
- High manufacturing quality through quality control by PDE-system

Installation process



Cover and sealing rubber

Positioning of steel pipe



Fields of application

- Foundation piles
- Tangent pile walls
- Sealing piles
- Gravel piles
- Sand piles

Soil types

- Not cohesive soils up to medium density.
- Silt up to semi dense consistency.

Pile diameter

- Pile diameters possible from 300 to 900 mm, in some geological conditions up to 1500 mm.

Pile length

- Due to the coupling design of the steel pipes the length of the piles does not depend on the leader length. It is only determined by the firmness of the soil. With pull-down forces of up to 50 t pile lengths of 50 m can be achieved.

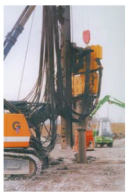
Inclined piles

- The standard model offers the possibility of all inclinations between 1:6 forward and 1:1 backward.
- With steel pipe and vibrator it is possible to work with a maximum inclination of 45°.

Bearing capacity

- The bearing capacity of the piles depends on the soil conditions and on the pile diameter. When friction piles are installed, it also depends on the pile length that is introduced into bearable soil layers.
- Thanks to numerous results of test loadings carried out with vibrated cast-in-place piles in various soil conditions, the bearing capacity of the pile can be determined from building projects with comparable soil conditions. There is no need for proving their stability by new test loadings. Maximum capacity of 4000 kN is possible.
- The vibration caused during the process of pipe extraction (controlled by the vibrator) creates concrete of excellent quality. Due to the possibility of changing the static moment the soil can be further compacted using the frequency of resonance in order to enhance the pile bearing capacity.

Vibrating into the ground



Installing the reinforcement cage

Filling in the concrete

Extracting the steel pipe

Completed pile

Application
Vibrated cast-in-place pile

Examples

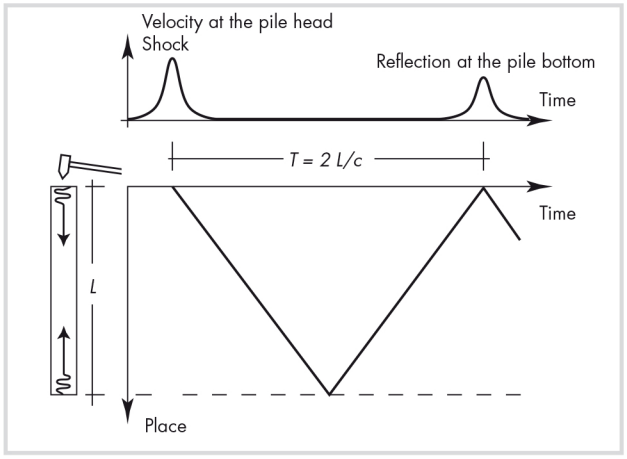
Basic machine	LRB 155	LRB 255
Vibrator	Dieseko 2323VM	Dieseko 40VM
Pile length	20,00 m	30,00 m
Pile diameter	508 mm	900 mm
Soil type	Gravel and sand, not cohesive soil up to medium density. Clay and silt (cohesive soils) up to stiff consistency.	

Advantages

- High performance since the pipe is vibrated into the ground as one piece.
- Due to the sealed design (cover with sealing) neither ground water nor soil can get into the casing of the pile to be installed.
- The displacement of soil and the vibration cause an improvement of the ground directly adjoining the pile.
- Reinforcement cage and concrete are installed into the dry steel pipe in a short time.
- Exact determination of the pile length and diameter according to the geological and static conditions.
- No errors in the concrete since it is filled into the dry pipe up to the pile top.
- Significant reduction of noise and vibrations through utilization of high frequency vibrator with variable moment control.

Integrity tests carried out

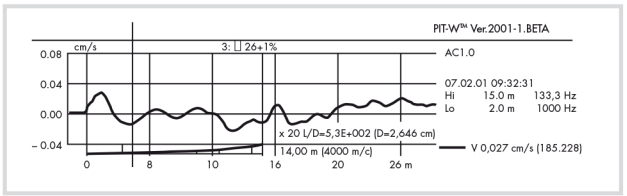
In order to check the intactness and the pile form of the cast-in-place piles integrity tests were carried out at various building sites. This is done by exposing the pile head to a light shock, which produces a shock wave running down the pile shaft. This wave is reflected at the bottom of the pile and runs up the pile shaft again as an echo.



Relation of place and time during the shock test

The shock wave and the echo are recorded by an accelerometer. If the shock wave causes a clear reflection of the pile bottom and if there are no faults within the pile shaft, the test is passed.

A total of 1200 tests were carried out. All tested piles showed a clear echo of the pile bottom and were classified 1a and 1b with an ideal signal course. All piles could be used without any restriction.



Typical signal course
(wave speed 4000 m/s)

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BVV Spezialtiefbautechnik Vertriebs GmbH
Bleibtreustrasse 9, D-81479 Munich/Germany
Tel.: (+49) 089-66 51 930
Fax: (+49) 089-61 31 748
info@bvv-spezialtiefbau.de
www.bvv-spezialtiefbau.de