



KURT MOTZ

Hoch-, Tief- u. Strassenbau Civil Engineering



Ductile cast-iron piles

Pile system
approved by
DIBt

(German
Institute
for Civil
Engineering)

Highly
successful
foundation
system,
developed
in 1985

Pile production

Ductile cast-iron piles

These ductile cast-iron piles have been in use in German-language countries since 1985, and represent a cost-effective alternative in comparison to other types of piles, owing to high production output.

These cast-iron piles can be used for pile-driven foundations for all kinds of civil-engineering work, as well as for upright channels, bridge foundations, etc.

Structural
engineering

Industrial
engineering

Bridge building

Pipeline
installation

Silo foundations

Foundation
reinforcement



Driving ductile cast-iron piles

Ductile cast-iron piles are driven into the soil by hydraulic excavators and rapid-stroke pile-drivers. The leading pipe has a pile shoe at the lower end with a diameter of 118 ... 250 mm, depending on the kind of production and the cast-iron pipe used.

After the leading pipe, each further pipe is inserted in the sleeve of the emplaced pipe. The pile is installed down to the final depth in accordance with the soil penetration resistance.



Insertion sleeve
connection
for the pipes

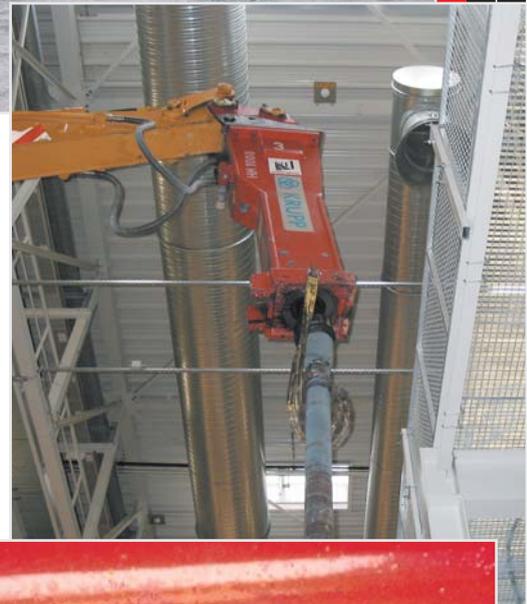
Advantages of ductile cast-iron piles

- Ability to be driven in poor subgrades
- High production output of the piles
- Simple matching of pile lengths to irregular subgrade conditions
- Effective transfer of horizontal loads from wind and earthquakes owing to possible slanting of the piles; inclination up to 45° possible
- By shortening the pipes, pile installation is also possible with restricted working heights
- Depth of piles up to 50 m



Pile variations

The piles are produced from cast-iron pipes with diameters of 118 or 170 mm, depending on the loads to be supported.



Cast-iron piles

Maximum permissible load onto the piles, with account taken of the interior mortar filling (mortar strength class = B25)

Diam. 118 x 7.5 mm	507 kN
Diam. 118 x 9.0 mm	605 kN
Diam. 170 x 9.0 mm	951 kN
Diam. 170 x 10.6 mm	1.106 kN



Source: Table 6 of the German Regulations for Civil-Engineering Approval (Z-34.25-202 dated 18 October 2001)

Grout injection piles

Grout injection

The piles can also be provided as grout-injected piles, with pile diameters of 200 or 250 mm, depending on the existing subgrade.

Grout injection piles

A wedge is cut out at the lower end of the leading pipe, and pile shoes with a diameter of 200 or 250 mm are then attached.

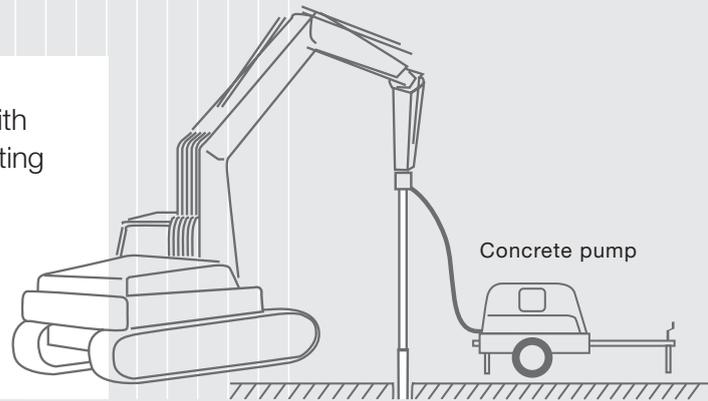
During driving, concrete mortar is pressed through the head of the pile. The mortar emerges through the cut-out wedge at the foot of the leading pipe. It then produces a continuous concrete casing for the cast-iron pipe in the driving shadow of the enlarged pile shoe.

Benefits:

1. Enlargement of the pile cross-section, with resulting larger mantle surface
2. Enhanced tooth action, with better transfer of loads into non-cohesive soil

Loading test

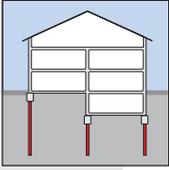
For conventional testing, the pile is loaded in several stages up to final test load by means of a hydraulic press. The reaction piles are produced as GEWI grout- or mantle-injected ductile cast-iron piles.



Examples of use

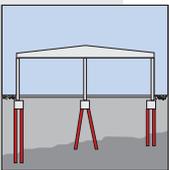
Pile foundations

Ductile cast-iron piles



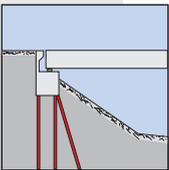
Structural engineering

The ductile cast-iron pile system is especially effective for foundations of urban buildings in gap sites, owing to good manoeuvrability of the machines and short construction time. The use of pile-foundation grids with masonry-wall thicknesses allows considerably less foundation material, for even greater cost effectiveness.



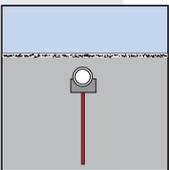
Industrial construction

This pile system is excellent for the foundation of prefab buildings – usually built as light structures, but highly sensitive to settlements and especially to differential settlements. The configuration of pile piers safely transmits wind and earthquake loads into the subgrade.



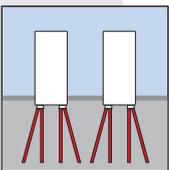
Bridge construction

Simple and rapid adaptation of the construction equipment is essential in providing foundations for bridge abutments. Transmission of loads into the soil must be clearly broken down according to load components: moments are transmitted by pile piers, and horizontal forces, by piles driven at an angle.

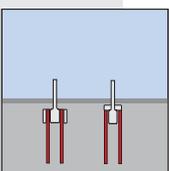


Pipeline construction

Provision of foundations for pipelines for prevention of harmful settlement.



Silo foundations



Foundation reinforcement

Sheet-pile walls

Anchoring

Our company provides complete solutions for excavation projects: beginning with consulting, including structural-engineering planning ready for official examination, and extending to the actual excavation work itself.

For all applications, we have the optimal equipment and techniques for a wide variety of your project needs: e.g., whether in sensitive downtown areas, or for power plants in previously non-developed areas.



The largest field-stone ramp made in Europe: In the River Iller, near Ulm, Germany

Anchor drill system: The Klemm KR 804-1, with drill stem magazine, in use in Bad Blankenburg (Thuringia), Germany



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