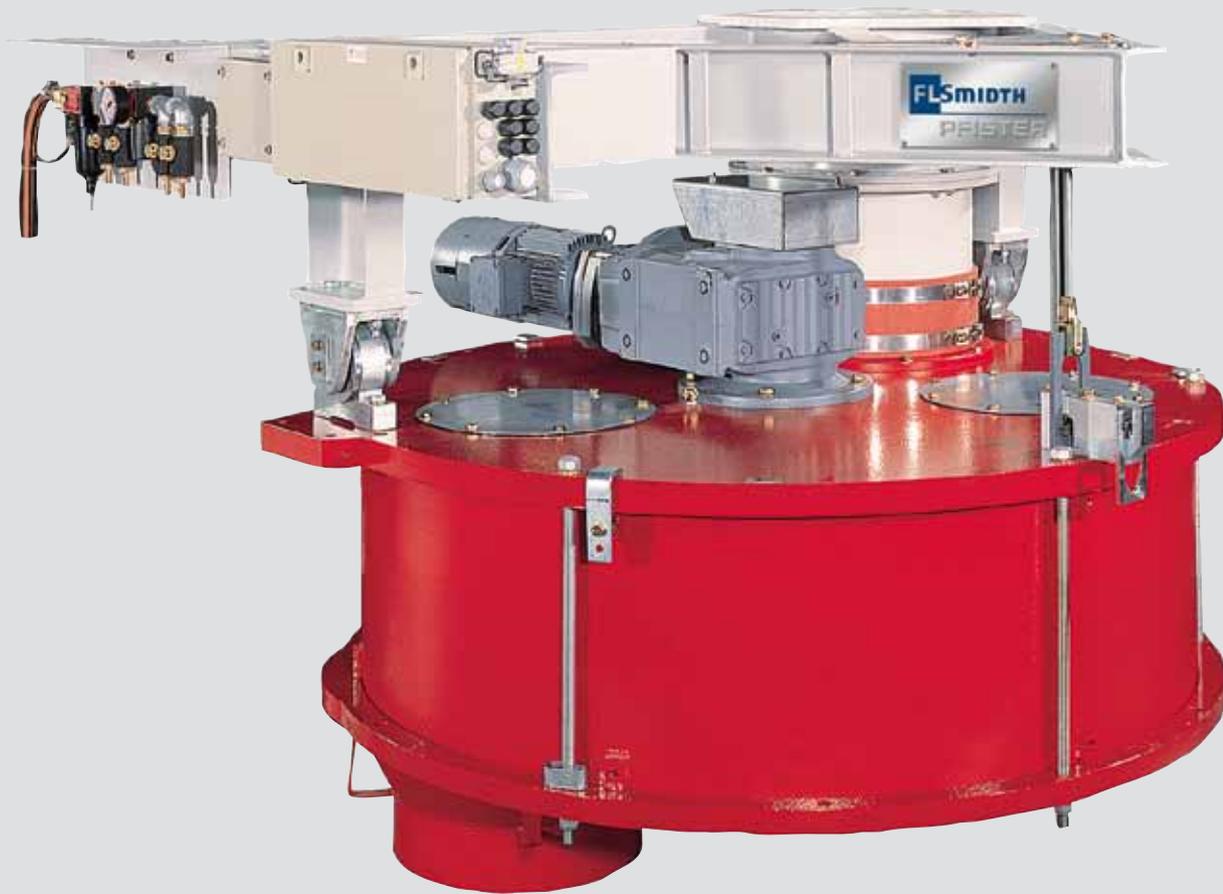


One Source

Product Brochure Pfister® TRW / TRW-K



Gravimetric feeding of abrasive and hot materials

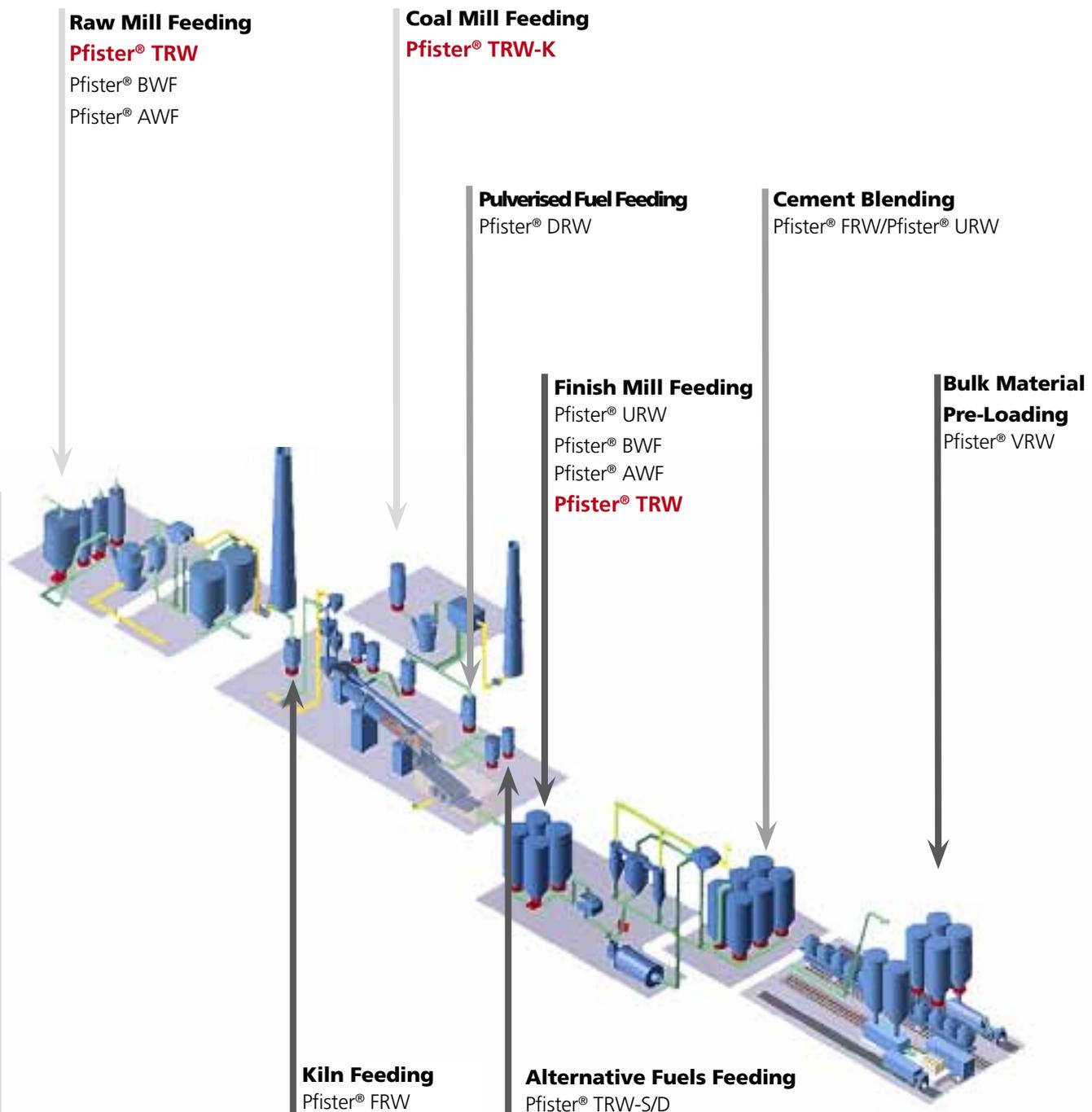


Watch here how this rotor weighfeeder works!

FLSMIDTH
PFISTER

Dosing and feeding for industrial production

FLSmidth Pfister® feeding and dosing devices exemplary in the cement production process:



Tradition & progress

FLSmidth Pfister has almost 120 years of experience in manufacturing of industrial weighing equipment. It has been member stock quoted FLSmidth Group/Denmark since 1998.

The patented rotor weighfeeder was invented by Pfister in 1984 to feed pulverised fuels for the cement burning process. This state-of-the-art dosing device has proved its properties in more than 2,500 installations worldwide.

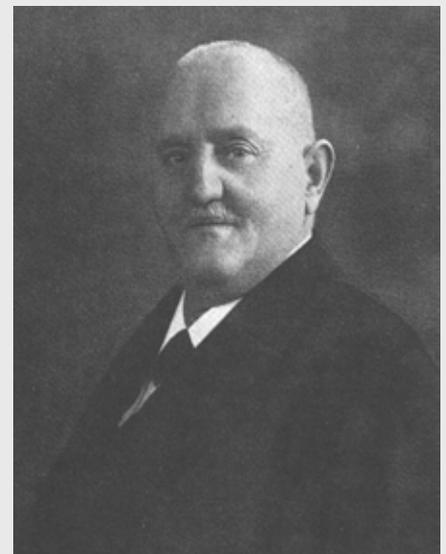
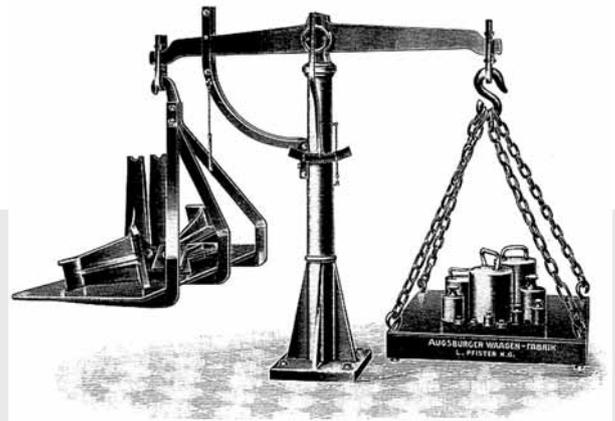
FLSmidth Pfister additionally supplies know-how for equipment, related to the coal feeding process in order to ensure problem-free material handling and optimal pneumatic transport of the coal.

Fuels have a wide variety of material characteristics. Thus, FLSmidth Pfister helps to design individual installation solutions.

Pfister® weighfeeders are

- **engineered**
- **designed**
- **assembled**
- **tested**

**with the experience
of almost 120 years.**



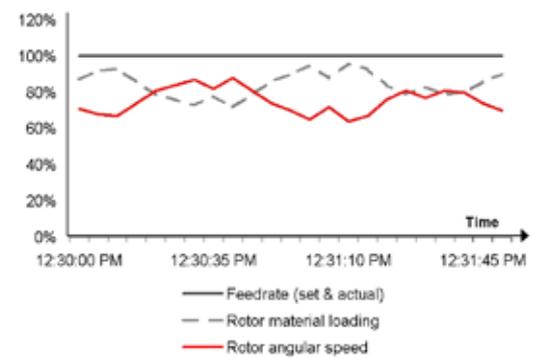
*German Ludwig Pfister founded
the company in 1894
Above: Historic scale*

Functioning principle of Pfister® rotor weighfeeders

The picture below displays a rotor weighfeeder Pfister® TRW for dosing coarse, abrasive and hot materials. However, the weighing and dosing principle of all Pfister® rotor weighfeeders is identical:

Material is extracted out of the material silo and is transported in the rotor chambers (1) from the inlet (2) to the outlet (3). The rotor is mounted on bearings which form a weighing axis (A-A). This axis (A-A) is eccentric to the rotor shaft, and through the middle of inlet. The third point is suspended at a load cell (6) which weighs the content in the rotor wheel gravimetrically. This means the rotor weighfeeder measures actual kilograms and is therefore a real scale. The measured gravimetric force provides information on the mass of the bulk material in the rotor weighfeeder before material discharge. The load of the rotor and the related rotor wheel position, is stored by the weighing electronics. The rotor wheel speed is controlled invers to the measured force. The feeder discharges the material at the outlet (3) with a highly accurate mass stream.

To achieve high accurate feeding, the angular speed of rotor is controlled invers to its loading.



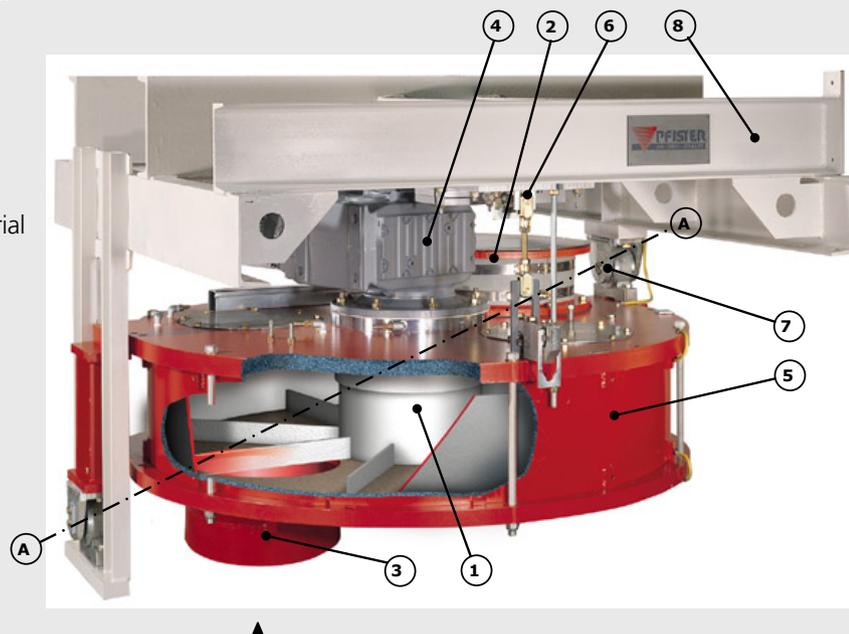
Prospective Control ProsCon®: Advanced Weighing Electronics

The electronic controller calculates the required speed of the motor for the time of the discharge. It uses the set feed rate and the measured bulk material mass to calculate the angular speed of the rotor (see chart). Less material in the rotor results in a higher angular speed, more material in a lower speed.

With this pro-active principle, the prospective control ProsCon®, Pfister® rotor weighfeeders achieve highly accurate compensation of variations in rotor loading and material density. This results in an extremely accurate short- and long-term feed rate.

A-A: eccentric weighing axis

- 1: rotor wheel
- 2: bulk material inlet
- 3: outlet
- 4: variable speed drive
- 5: rotor housing
- 6: load cell
- 7: weighing bearing
- 8: suspension frame



Customer benefits of Pfister® rotor weighfeeders

Outstanding reliability & long service life

- Simple design with minimal number of functional parts
- Slowly moving rotor
- Steel only in contact with material

High short- and long-term accuracy

- Prospective control ProsCon® (see below)
- Online calibration during operation if the pre-hopper is equipped with load cells
- Insensitive to pressure fluctuations in the process

Intuitive operator interface

- The rotor weighfeeder is an advanced mechatronic system
- However, it is easy to operate
- Flexible, reliable communication to the local plant control system

Easy maintenance

- All measuring parts and drives are accessible from the outside
- No cleaning necessary since no spillage possible
- Integration of material extraction, weighing, feeding and dosing in one system

Instantaneously adjustable feed rate

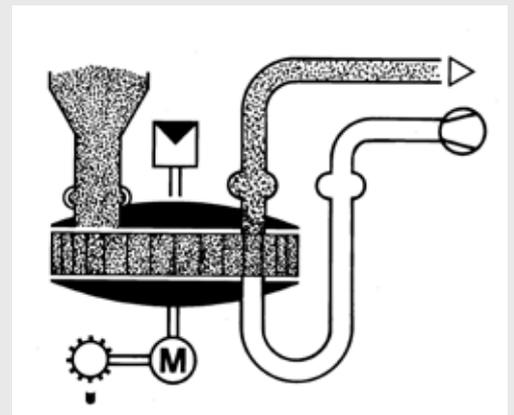
- High accuracy in a range from 10% - 100% of max. feed rate
- Feed rate can be adjusted promptly without loss in accuracy
- Prospective control ProsCon® ensures virtually no reaction time in changes of the feed rate

Reactive Control Compared to Proactive Control Strategy

Other feeders are based on a reactive control (follow-up) rather than a pro-active control. Deviations in feed rate is measured and thus pre-feeding is adjusted. The measured deviation is already sent to the process. This also requires a sensitive pre-feeding device.

With the pro-active rotor weighfeeder, the material mass is measured before it leaves the rotor weighfeeder. That means that the speed of the rotor is adjusted before the material gets discharged into the system. The result is an extremely high accuracy.

*Prospective control ProsCon®,
pro-active control strategy*



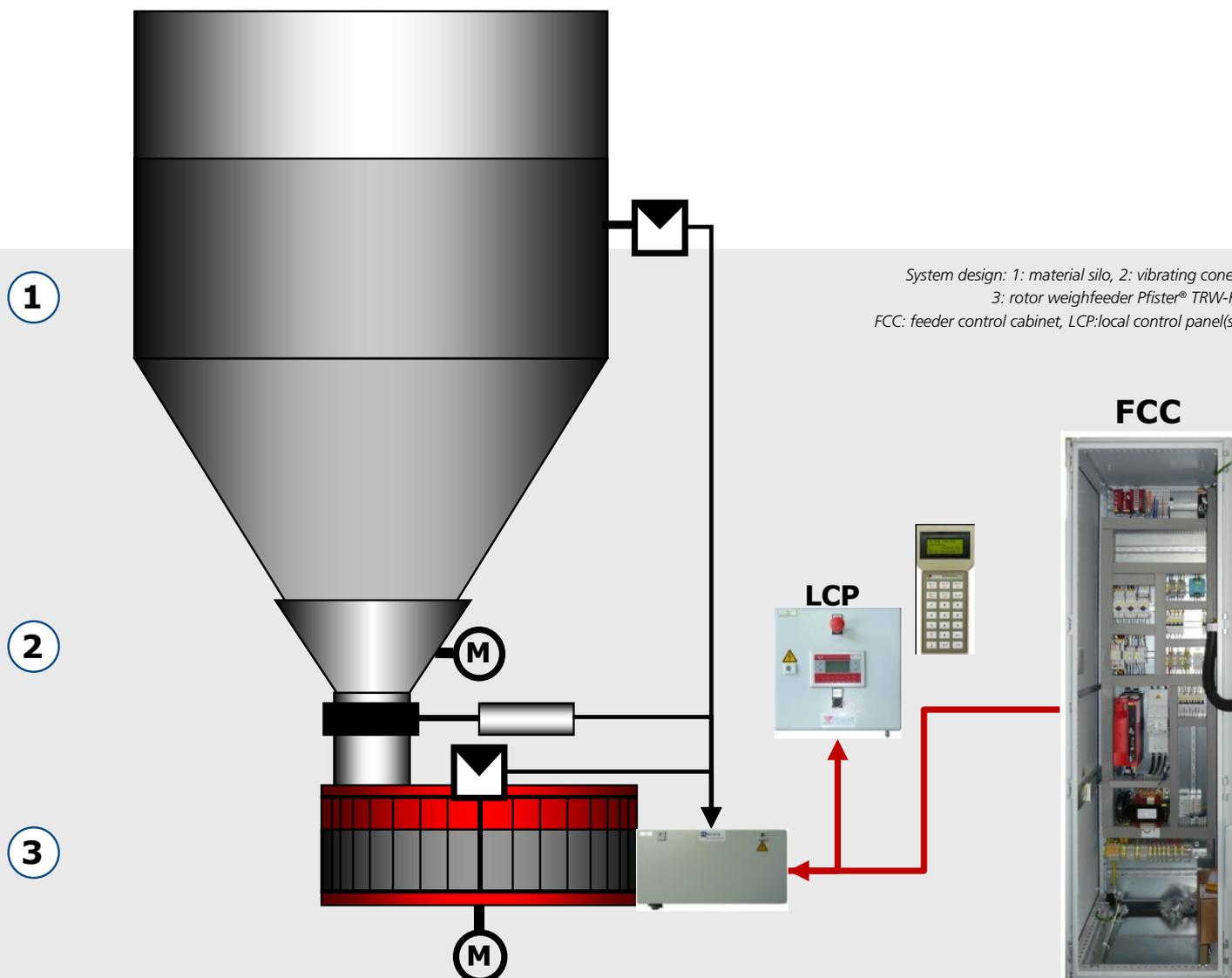
Structure of the dosing system: F-Control™ + dosing machine

F-Control™ dosing control system is used for continuously operating gravimetric feeders like rotor weighfeeders, belt weighfeeders, etc.

The main structural elements are a control cabinet FCC located in the plants motor control center (MCC) and local control panels (LCP) specifically designed for the environment surrounding the rotor weighfeeder (FIELD).

The control cabinet FCC contains all controller parts for dosing and regulation of the rotor speed. This also includes the monitoring of these functions.

The local control panel(s) LCP contain the interface to link the F-Control™ dosing control to the process and all devices to provide local access for maintenance and service operation.



Rotor weighfeeder Pfister® TRW

Highly accurate and reliable gravimetric feeding of all sorts of coarse bulk materials such as limestone, gypsum, or partially ground cement

Whether metering materials into a coal mill, raw mill or finish mill, the robust design of rotor weighfeeder Rotor weighfeeder Pfister® TRW is ideal for metering coarse bulk materials such as raw coal, clinker, partially ground cement, limestone, gypsum etc. with a high level of constancy and precision. The integration of material extraction, weighing and metering makes the system easy to operate and extremely reliable.

Rotor weighfeeder Pfister® TRW achieves a wide output range up to 400 t/h. Rotor weighfeeder Pfister® TRW also copes with high material temperatures up to 200 °C, since inside the device the material to be dosed is only in contact with the steel rotor.



Technical facts of rotor weighfeeder Pfister® TRW

Application fields: Grinding process and pre-loading

Materials: Bulk materials such as limestone, gypsum, pre-ground cement, clinker

Dosing capacity: Up to 400 t/h

Design example:

- Calibration pre-hopper
- Pre-hopper load cells
- Needle gate
- Rotor weighfeeder Pfister® TRW

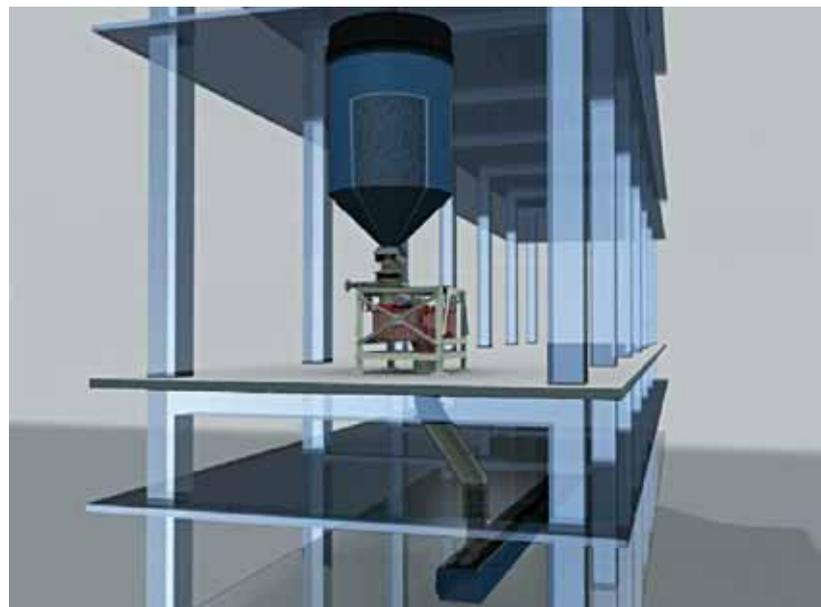
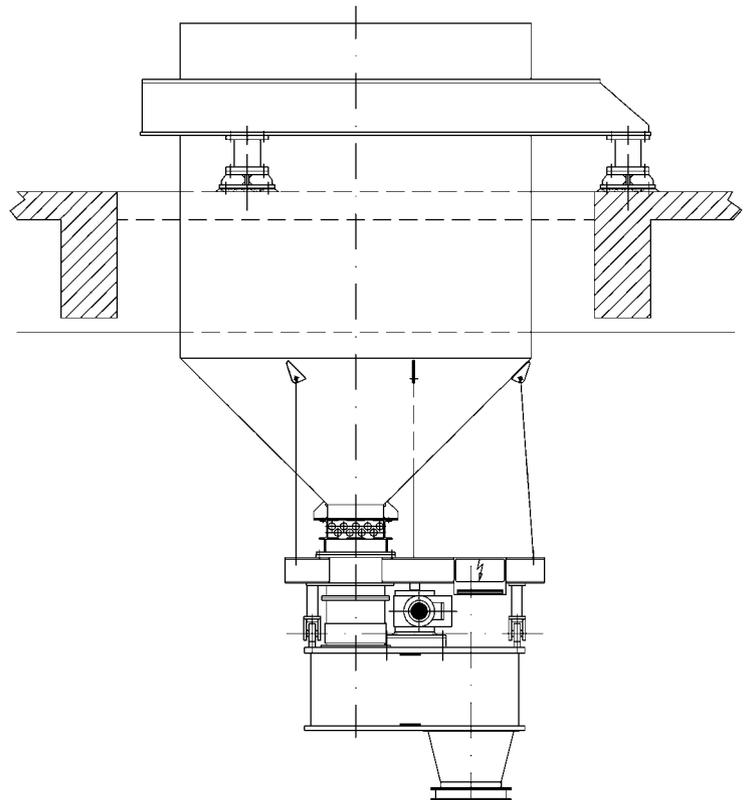
Features:

- Stable material dosing
- Outstanding reliability
- High short- and long-term accuracy
- Compact, robust and closed design
- High measuring loads
- Large feeding range
- Online calibration possible
- Simple and modular design
- Slowly moving rotor
- Easy to maintain

Dosing control:

- Feeder dosing controller Pfister® FDC
- Prospective control ProsCon®
- FlowBalance™ control
- User oriented interfaces
- Remote service access available

Certificates: ISO 9001



Applications with Pfister® TRW: Feeding at a cement mill

Upper picture:

Rotor weighfeeder Pfister® TRW feeding materials into the cement mill at a grinding plant. The complete closed and dust tight design reduces dust emissions of the plant.

Lower picture:

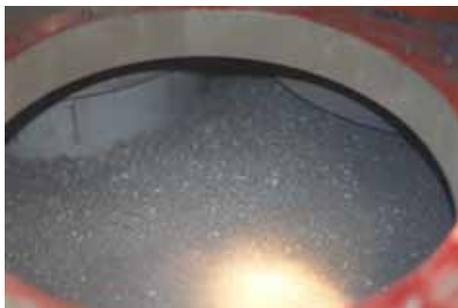
View through the service opening in the top sealing plate of rotor weighfeeder Pfister® TRW.



Clinker feeding at a cement plant

At this cement plant highly abrasive pre-ground cement clinker is fed into a roller mill circuit by rotor weighfeeders Pfister® TRW.

The smaller picture grants a view into the rotor through a service opening.



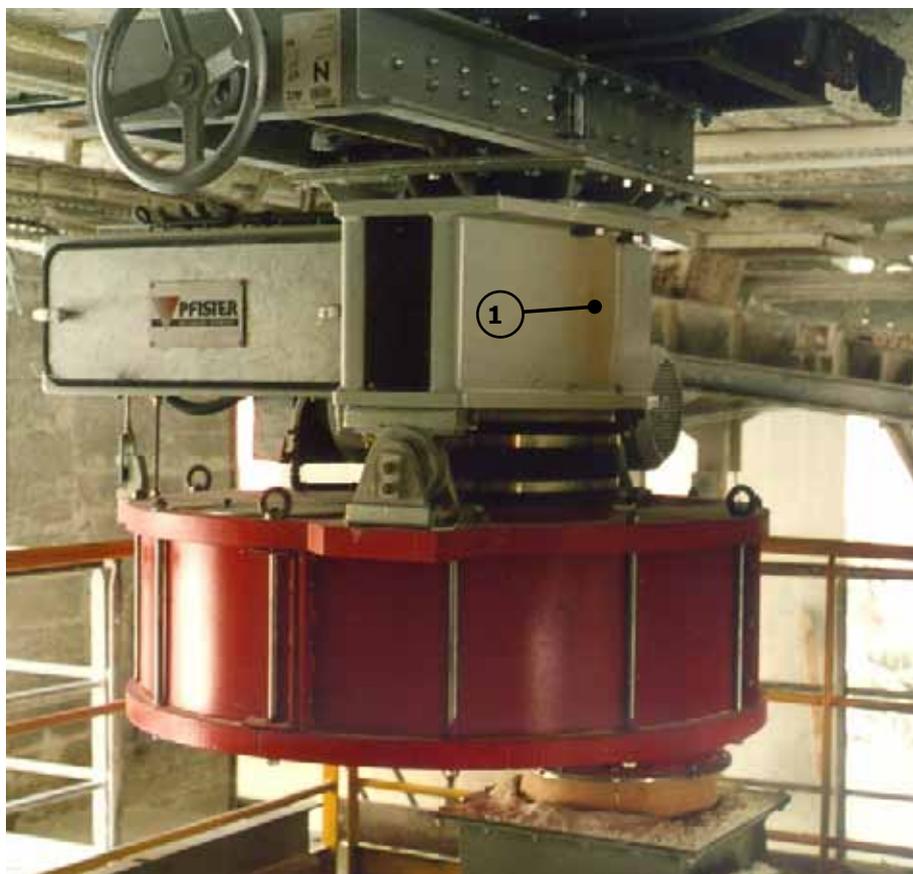
Modernisation of white clinker feeding to a cement mill

In the course of modernising this cement plant a traditional belt weighfeeder with rubber belt (see upper picture) was replaced by a rotor weighfeeder Pfister® TRW.

While the customer had to replace the belt of the old installation regularly, with rotor weighfeeder Pfister® TRW wear and maintenance were reduced drastically.

The lower picture displays the the installation with rotor weighfeeder Pfister® TRW for hot white cement clinker. Rotor weighfeeder Pfister® TRW was mounted directly to the silo outlet.

It is possible to feed material with peak temperatures of 250°C since only steel parts are in contact with the bulk material. Fading of the paint at the frame proofs extreme temperatures (1).



Iron oxide feeding at a cement mill

In this installation for iron oxide feeding rotor weighfeeder Pfister® TRW is suspended at the calibration pre-hopper which is placed on load cells. This makes online-calibration possible. The iron oxide is dosed into the milling process precisely.



Pre-ground white cement clinker feeding

The picture on the right displays rotor weighfeeder Pfister® TRW for pre-ground white cement clinker directly flanged to the silo outlet.



Rotor weighfeeder Pfister® TRW-K

Highly accurate, reliable and efficient dosing of crushed coal in power plants

Rotor weighfeeder Pfister® TRW-K for dosing crushed coal is based on the patented rotor weighfeeder technology which has proved itself in operation worldwide. The robust, wear-resistant design makes the system extremely reliable. Heavy measuring loads provide high dosing accuracy.

Powered by the state-of-the-art prospective control ProsCon®, mass flow is controlled in advance. This makes it possible to achieve stable and accurate dosing of crushed coal. Rotor weighfeeder

Pfister® TRW-K is designed as a totally closed, dust-tight, all metal device in a pressure-proof design. Thus, a coal firing process with maximum efficiency is guaranteed.



Technical facts of rotor weighfeeder Pfister® TRW-K

Application fields: Crushed coal grinding and firing process

Fuel: Crushed raw coal

Dosing capacity: Up to 200 t/h

Design example:

- Flexible joint
- Vibrating hopper
- Flexible joint
- Shut-off gate
- Rotor weighfeeder Pfister® TRW-K
- Flexible joint
- Down spout

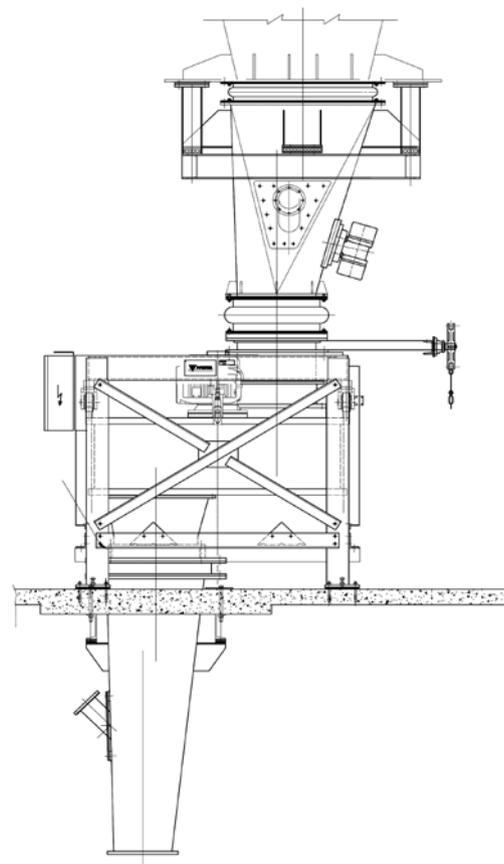
Features:

- Gravimetric weighing
- Stable coal dosing and outstanding reliability
- High dosing accuracy and constancy which guarantees an efficient grinding and firing process
- Compact, robust, closed dosing system
- All metal construction (no rubber, no belts, no idlers, no pulleys)
- Pressure-proof design
- Easy to install
- Large dosing feed range
- Low speed moving rotor, reliable and safe operation
- Self-cleaning, no material spillage
- Extremely economical in respect to power consumption
- Easy removal of any foreign material through service openings
- Negligible wear
- All measuring elements accessible from the outside, therefore easy to maintain

Dosing control:

- Feeder dosing controller Pfister® FDC
- Prospective control ProsCon®
- User oriented interfaces
- Remote service access available

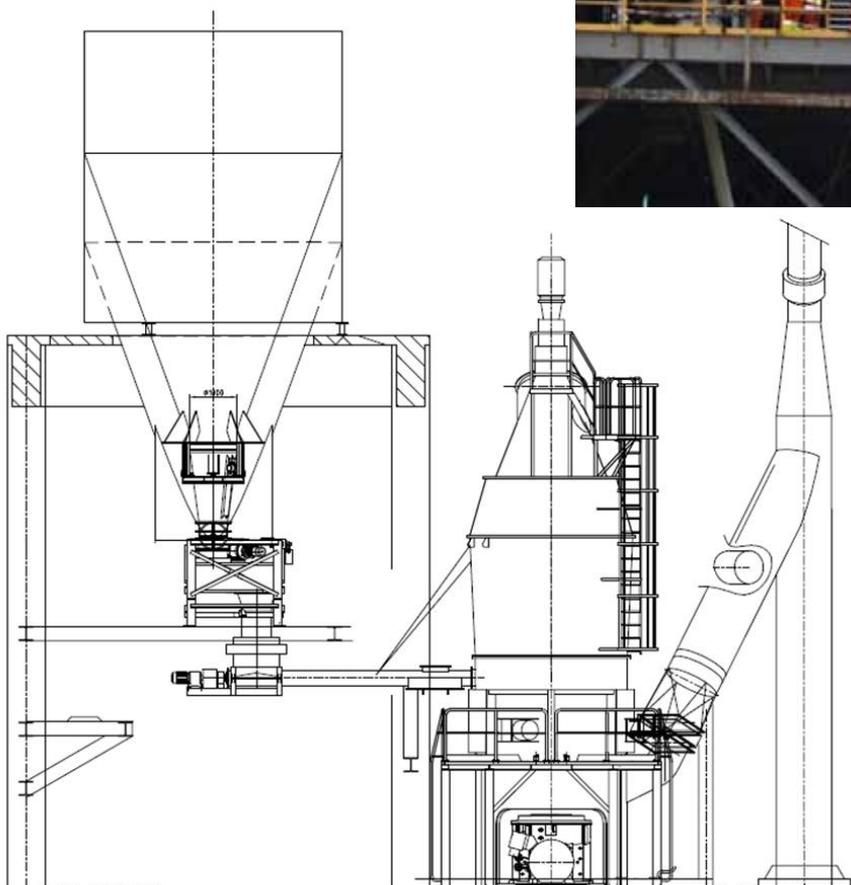
Certificates: ATEX in categories II1/2D and II1/3D, ISO 9001



Applications with rotor weighfeeder Pfister® TRW-K: Coal mill feeding

In this plant open belt weighfeeders for raw coal feeding were replaced by gravimetric dosing rotor weighfeeders Pfister® TRW-K with a capacity of 50 t/h (raw coal feeding).

After rotor weighfeeder Pfister® TRW-K discharges the coal, the material is transported to the coal mill inlet by a drag chain feeder.



Applications with rotor weighfeeder Pfister® TRW-K: Coal mill feeding

In this power plant a table feeder was replaced by a state-of-the-art rotor weighfeeder Pfister® TRW-K.

There, rotor weighfeeder Pfister® TRW-K feeds raw coal at a feedrate of 40t/h into the coal mill constantly and with high precision.



German design & assembly of Pfister® rotor and belt weighfeeders

FLSmidth Pfister® weighfeeders are engineered, designed and assembled at FLSmidth Pfister's headquarters in Augsburg/Germany and at their workshop in India.

An experienced team of engineers and technicians tests all equipment at their own test systems.

In addition, Pfister® spares and parts are kept in stock for immediate disposal.



FLSmidth Pfister assembles all weighfeeders in Augsburg/Germany and in India



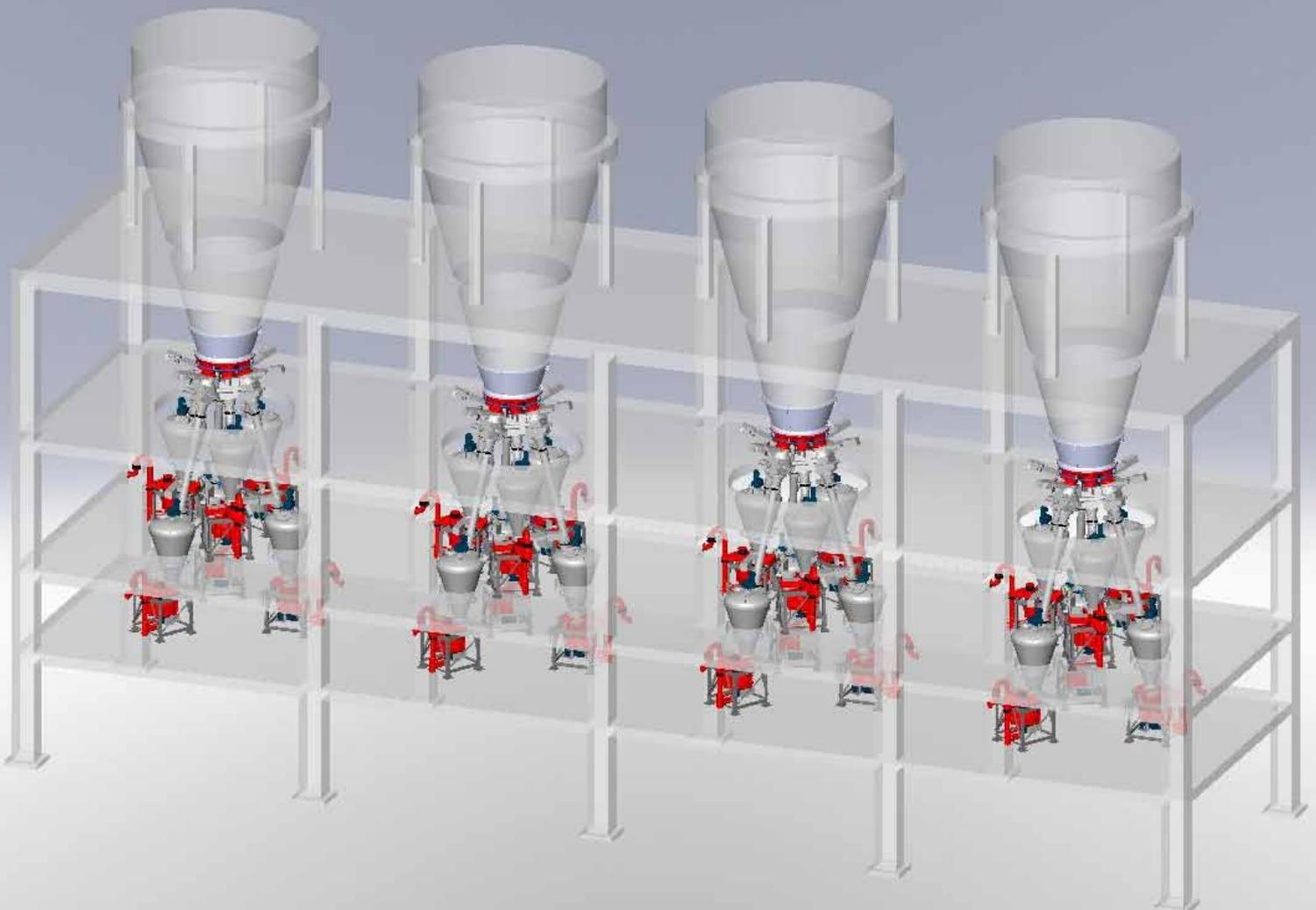
Engineering & design

FLSmidth Pfister® engineering services comprise:

- **Planning of the installations**
- **Silo engineering**
- **Calculation of pneumatic transport**
- **Further engineering services**

FLSmidth Pfister does not only supply the single dosing machines. FLSmidth Pfister's know-how includes the complete setup and surrounding of the installation like silo engineering, intermediate material transport and safety equipment.

That ensures that customers get all engineering from one experienced partner and one single source.



Pfister® customer service & after sales support

Thousands of FLSmidth Pfister® systems are currently in operation worldwide and require global presence. Therefore FLSmidth Pfister operates sales and service offices in eight countries on four different continents.

Experienced service technicians stand by your side and provide first-class service. A 24-hour hotline and online troubleshooting provide worldwide support. Also available are telesupport packages.

FLSmidth Pfister not only keeps a large number of spare parts in stock. Skilled spares specialists are looking forward to assist you in optimizing your own spare parts management.

FLSmidth Pfister® services are rounded up by service contracts, which can be adapted individually to the customer's needs.

Customer training on-site or at FLSmidth Pfister® training center ensures the best possible knowledge transfer.



Pfister® after sales support:

- **24-hour Hotline**
- **Telesupport**
- **Modern Maintenance Management**
- **Trainings and Seminars**
- **Service Contracts**

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