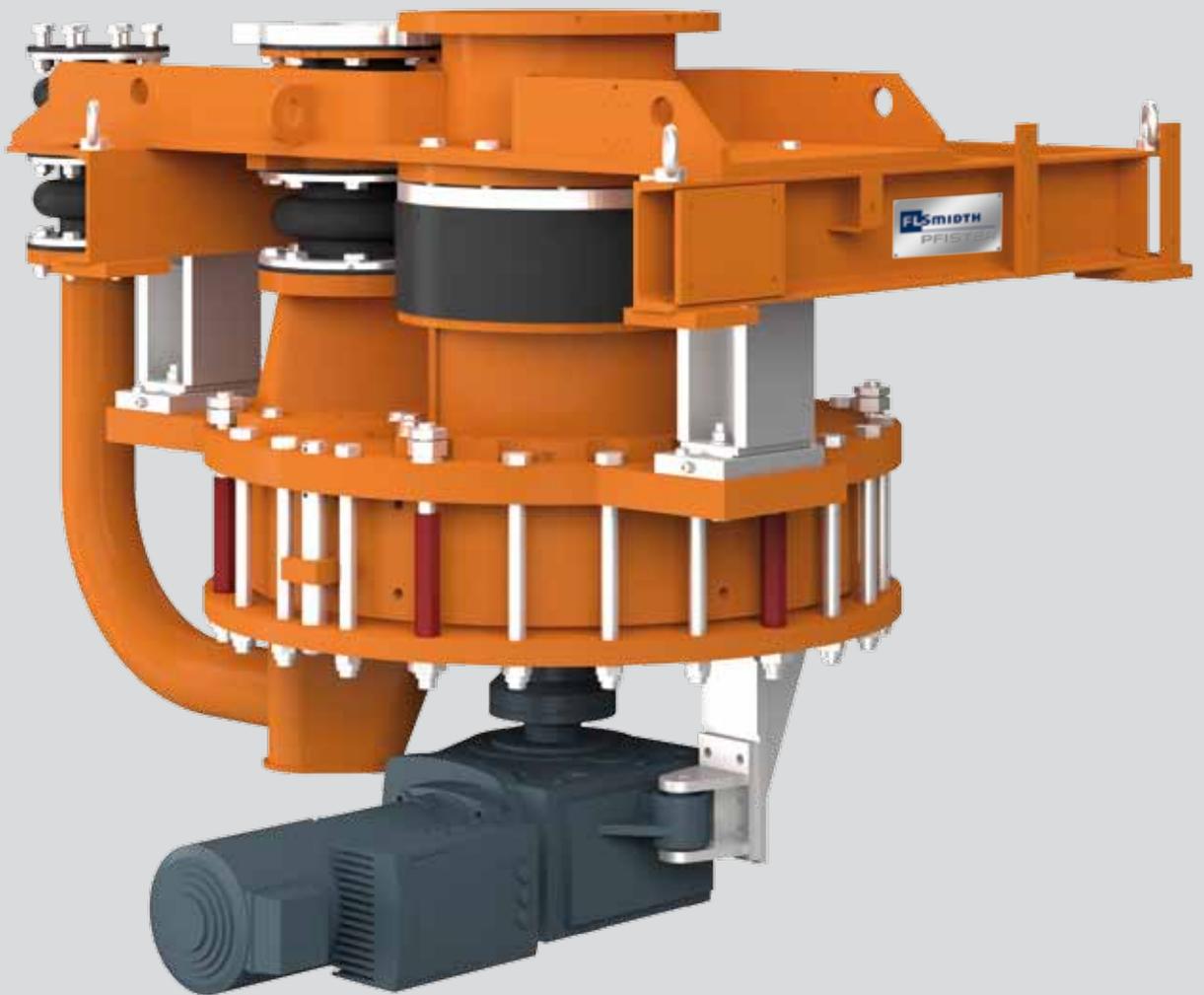


One Source

# Product Brochure Smart Coal Feeder Pfister® SCF



**Gravimetric dosing for pulverized coal  
in Asphalt, Heat & Steam Plants**



Watch here how Pfister® dosing solutions work.

**FLSMIDTH**  
PFISTER

# Smart coal feeder Pfister® SCF with integrated dosing electronics

**Highly accurate and reliable gravimetric feeding of pulverised fuels like coal dust, lignite dust, petcoke to the burning process in industrial environments like asphalt production, heat & steam generation**

Smart coal feeder Pfister® SCF is based on the industry-wide proven Pfister® gravimetric rotor weighfeeder technology. Smart coal feeder Pfister® SCF is especially designed for dosing pulverized fuels in industrial environments. Sturdy design and integration of material extraction, weighing, dosing and material transfer into a pneumatic conveying line make it a compact system. Due to a smart integrated control system high short- and longterm accuracy, dosing stability and low levels of emissions are realized.

Indirect firing of pulverised fuels require highly precise dosing devices. Smart Coal Feeder Pfister® SCF is used to extract pulverised fuels such as hard-coal, lignite or petrol coke out of a storage silo and feed it pneumatically with high accuracy and consistency to the burner to support an optimal burning process.

**FLSmidth Pfister: Dosing to Perfection.**



# Technical facts of Smart Coal Feeder Pfister® SCF

## Application fields:

Production facilities like asphalt plants, heat & steam generating plants and all industrial processes which require precise and stable fuel dosing

**Fuels:** Coal dust, lignite dust, petcoke

**Dosing control:**

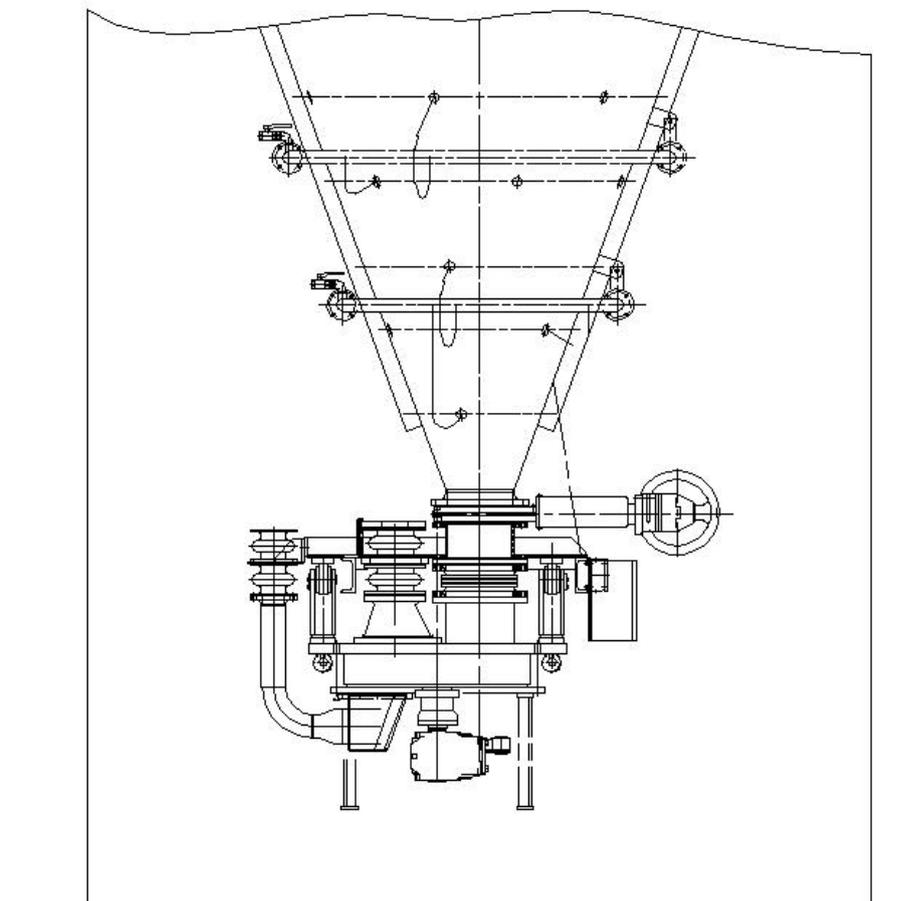
- Local Pfister® dosing controller
- Prospective control ProsCon®
- User oriented interfaces
- Remote service access available

**Dosing capacity:** From 0.2 - 5.0 t/h per system

**Features:**

- Stable fuel dosing
- Outstanding reliability
- High short- and long-term accuracy
- Compact, simple and modular design
- Explosion-proof
- Integrated pneumatic fuel transport
- Large feeding range
- Two systems under one coal silo possible
- Slowly moving rotor
- Easy to maintain

**Certificates:** ATEX

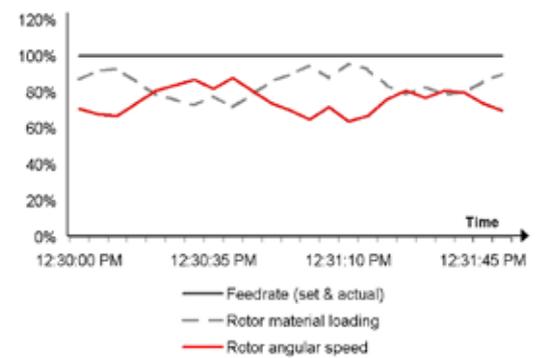


# Functioning principle of Pfister® rotor weighfeeders

The picture below displays Smart Coal Feeder Pfister® SCF which was cut opened for illustration purposes and to demonstrate the Pfister® weighing and dosing principle: Material is extracted out of the pre-hopper and is transported in the rotor chambers from the inlet (1) to the outlet (2). The rotor body is mounted on bearings which form a weighing axis (A-A). This axis is eccentric to the rotor shaft, and through the middle of inlet (1) and outlet (2). The third point is suspended at a load cell (3) which weighs the content in the rotor wheel gravimetrically. This means the rotor weighfeeder measures the actual material load and is therefore a real scale.

The measured gravimetric force provides information on the bulk material mass in the rotor weighfeeder before material discharge. The material load of the rotor and the related rotor wheel position, is monitored by the weighing electronics. The rotor speed is controlled inversely to the measured material load. The rotor weighfeeder discharges the material at the outlet (2) with a highly accurate mass stream.

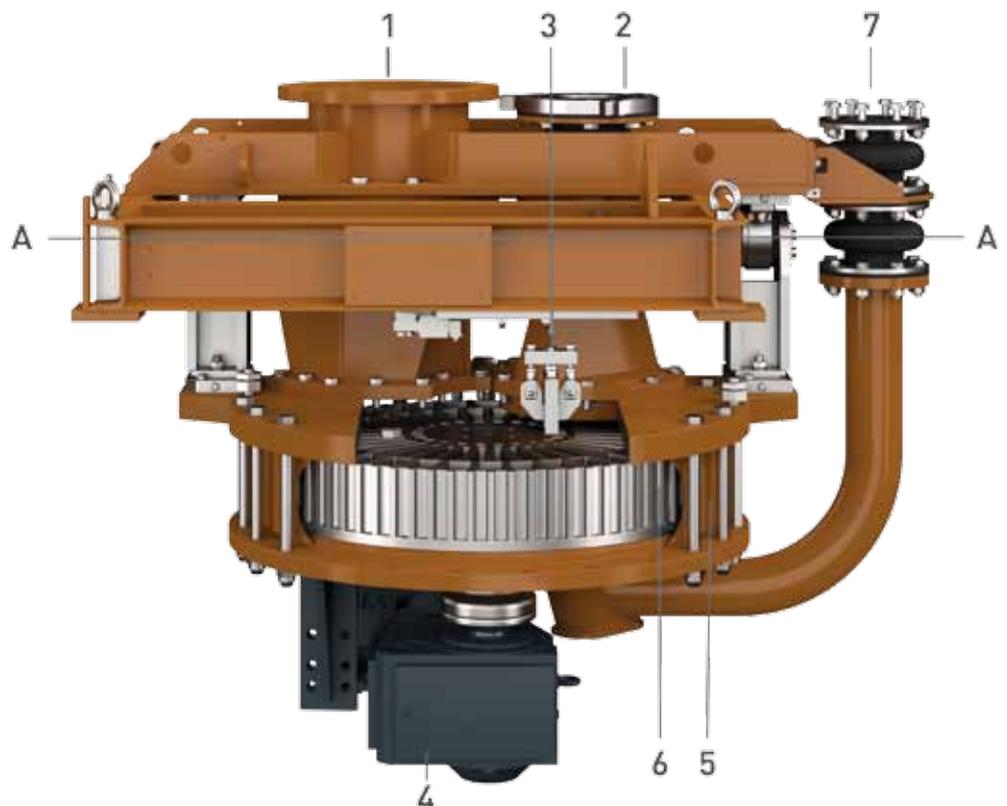
To achieve high accurate feeding, the speed of rotor is controlled inversely to its loading.



## 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 setpoint 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.

- 1: material inlet
- 2: material outlet
- 3: load cell
- 4: gear motor
- 5: rotor body
- 6: rotor with material chambers
- 7: inlet pneumatic transport air
- A-A: eccentric weighing axis



# Customer benefits of Pfister® rotor weighfeeders

## Outstanding reliability & long service life

- Simple design with minimal number of functional parts
- Slowly moving rotor
- Low wear due to material transported inside rotor chambers

## High short- and long-term accuracy

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

## Pneumatic transport to the burner

- Integrated in the feeding system
- Connected to a blower
- Clean transport air is blown through the feeder and transports the fuel to the burner
- FLSmidth Pfister system calculations provide optimal fuel transport to avoid material segregation in the pipes and thus pulsations or CO-peaks

## 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
- Integration of material extraction, weighing, feeding and dosing in one system

## Instantaneously adjustable feed rate

- High accuracy in a range from 10% - 100% of maximum 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

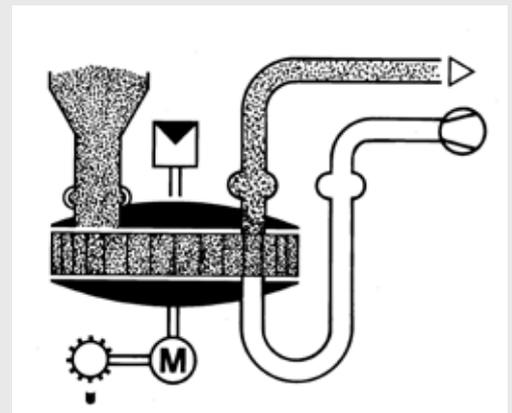
## Reactive Control compared to Proactive Control Strategy

Other feeders are based on volumetric or reactive control (follow-up) rather than a pro-active control.

With a reactive control deviations in material loading are measured and thus pre-feeding is adjusted. The measured deviation is sent to the process. A sensitive pre-feeding device is required here.

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*



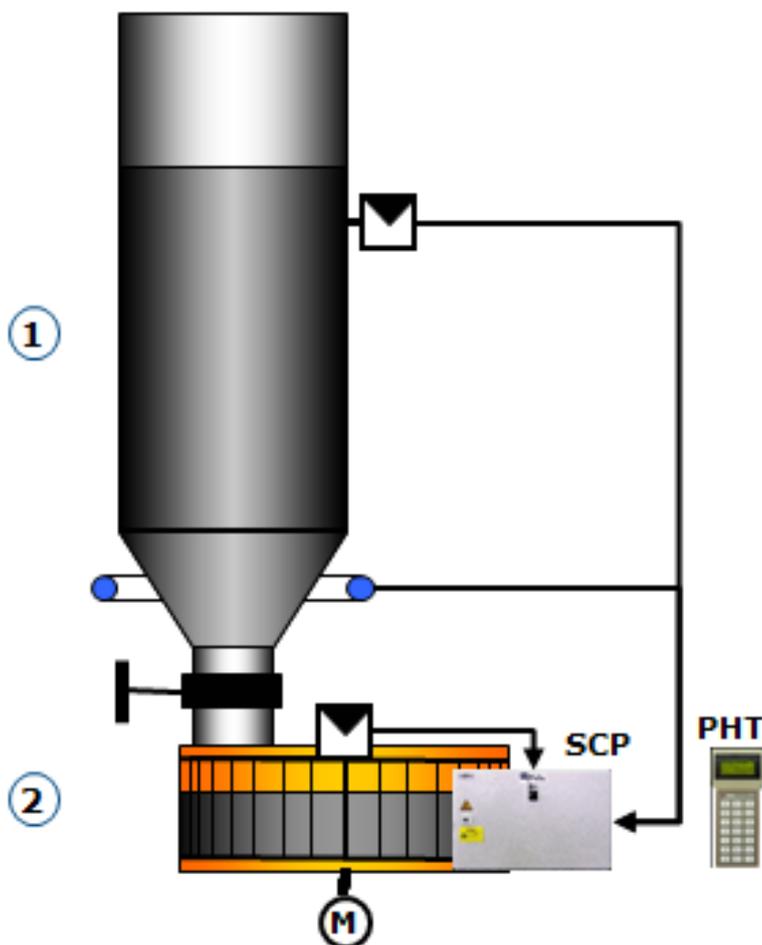
# Weighing Electronics of Pfister® rotor weighfeeders

The speed of the rotor wheel is controlled inverse to the coal loading of the rotor at the outlet. With this patented principle, the so called prospective control ProsCon®, FLSmidth Pfister® rotor weighfeeders achieve an extremely high short- and long-term accuracy and therefore an increase in the efficiency of the boiler firing process. The relatively large mass of crushed coal in the rotor weighfeeder results in a high momentary load in the measuring section. In practice this means that the effects of any externally disturbing forces can be neglected. Any pressure fluctuations from the material inlet or outlet are eliminated by the particular configuration of the bearings. This makes FLSmidth Pfister® rotor weighfeeders completely insensitive to pressure fluctuations.

**The Pfister® data sampling device and controller** (see scheme below) is mounted at the feeder, collects all data in the field.

**Communication between Pfister® feeding dosing controller and the plant control system via**

- Analog/Digital-Hardwired Interface.
- Serial Interface (ModBus RTU)
- Network-Interface (ProfiBus DP/Device Net/ or others)



## System design:

- ① silo
- ② Smart Coal Feeder Pfister® SCF

SCP: smart control panel  
PHT: Pfister handheld terminal

# Advantages of gravimetric feeding over volumetric feeding

**Gravimetric feeding with Pfister® rotor weighfeeders has substantial advantages over volumetric feeding. These advantages are essential for constant, reliable fuel feeding to the kilns or boilers and a big step towards more economical and ecological operation of plants.**

## Higher accuracy of gravimetric feeders regarding the calorific (energy) throughput:

The accuracy of volumetric feeders is mainly influenced by the variations in the following coal characteristics:

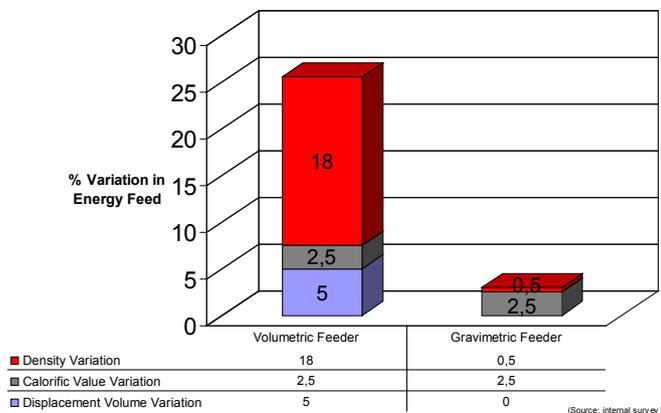
- Density
- Calorific value
- Displacement volume (lump size)

Gravimetric feeders reduce the influence of most of the variations as shown in the chart below. This results in a much higher accuracy in the feed rate of calorific (energy) value.

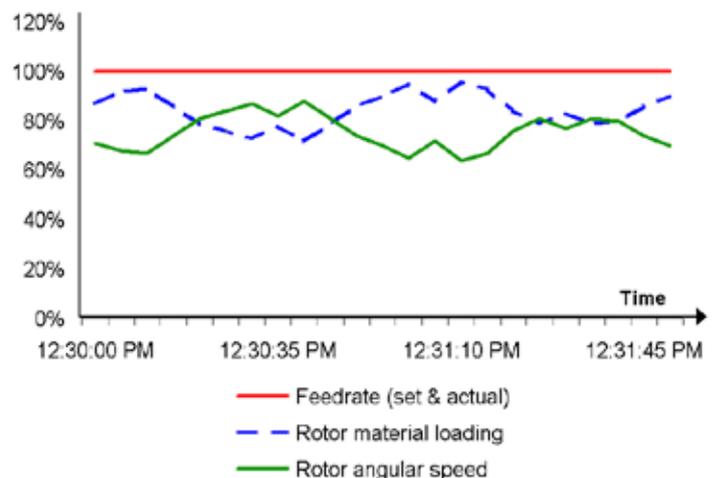
## Intelligent dosing control:

The algorithm of prospective control ProsCon® ensures very precise dosing by anticipating the variations in flow rate caused by material density and flow ability. This is enabled by measuring the material weight before dosing at the measuring point. Taking into account the setpoint and dynamic motion characteristics of the feeder, the necessary speed SI at the dosing point is calculated and adjusted at the prospective point before dosing. The result is a very constant and stable feeding over the short- and long-term.

Gravimetric feeding results in an extremely high accuracy in the feed rate as compared to volumetric feeding



Intelligent dosing control guarantees constant feed rates to the burners



# APPLICATIONS

## with Smart Coal Feeder Pfister® SCF

### Coal dust dosing at an asphalt plant in Germany

At this asphalt plant in Nuremberg / Germany lignite dust (TBK) is dosed into the burner for asphalt making. Smart Coal Feeder Pfister® SCF replaces old volumetric metering system rotary valves. In this application Smart Coal Feeder Pfister® SCF is laid out for feeding flexible rates between 0.2 - 2.0 tph.



# Dosing of coaldust at an asphalt plant in Germany

At this asphalt plant near Cologne/Germany lignite dust (TBK) is dosed into the burner during the asphalt making process.

With a feedrate of 0.3 to 3.5 tph gravimetric Smart Coal Feeder Pfister® SCF substitutes old volumetric systems to achieve more stable dosing.



# Coal dust dosing for heat and steam generation in China

This heat generation plant in Lanzhou City employs Smart Coal Feeder Pfister® SCF for dosing coal dust to the burner. The dosing rate is layed to 4 t/h.

At another plant in Suqian which generates steam two Smart Coal Feeder Pfister® SCF units are installed with a momentary feed rate of 2.5 tph each. This figure can be increased to 4 tph at the operator's request.



# 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, at their workshop in India and in China.

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

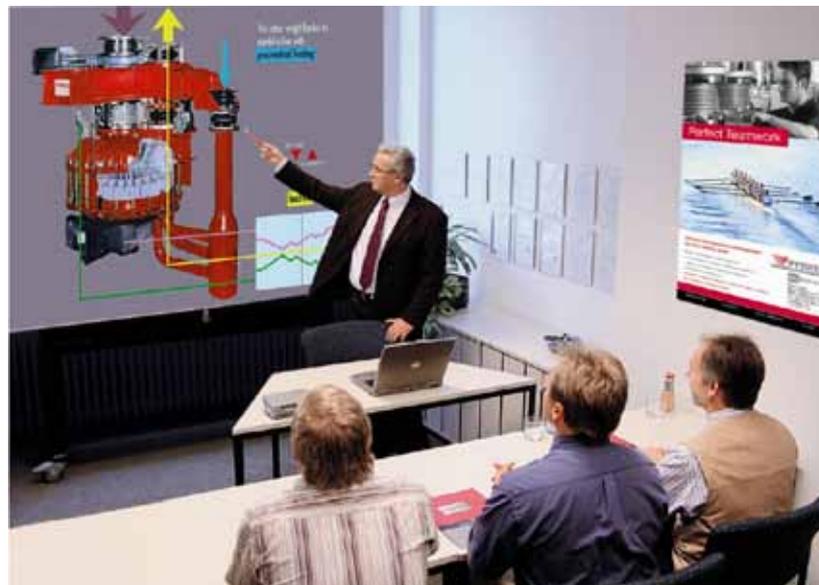
Thousands of FLSmidth Pfister® systems are currently in operation worldwide and require global presence. Therefore FLSmidth Pfister operates sales and service offices in eight countries on four different continents.

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.



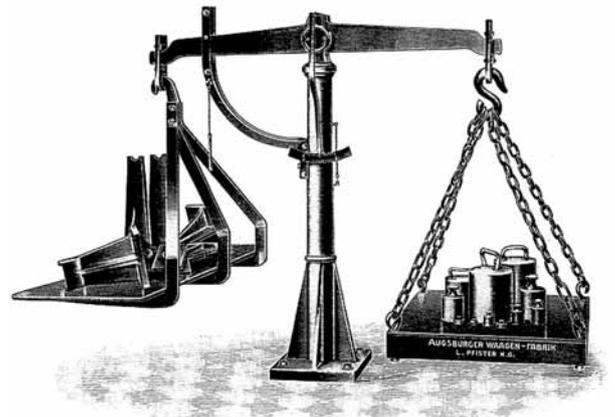
# FLSmidth Pfister: Dosing to Perfection.

**Dosing and feeding have been in the DNA of FLSmidth Pfister since the company's founding in 1894.**

FLSmidth Pfister has more than 120 years of experience in manufacturing of industrial weighing equipment. It is nowadays a member of the stock quoted FLSmidth Group/Denmark since 1994.

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 3,000 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 fuels. FLSmidth Pfister also designs individual installation solutions.



## TRADITION & PROGRESS

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



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