



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Instrumentation for the ready-mixed and pre-cast concrete industry

The right measurement system from aggregate to finished product

Everything from one source

Consultation, support and maintenance of measurement and automation systems for the ready mix industries



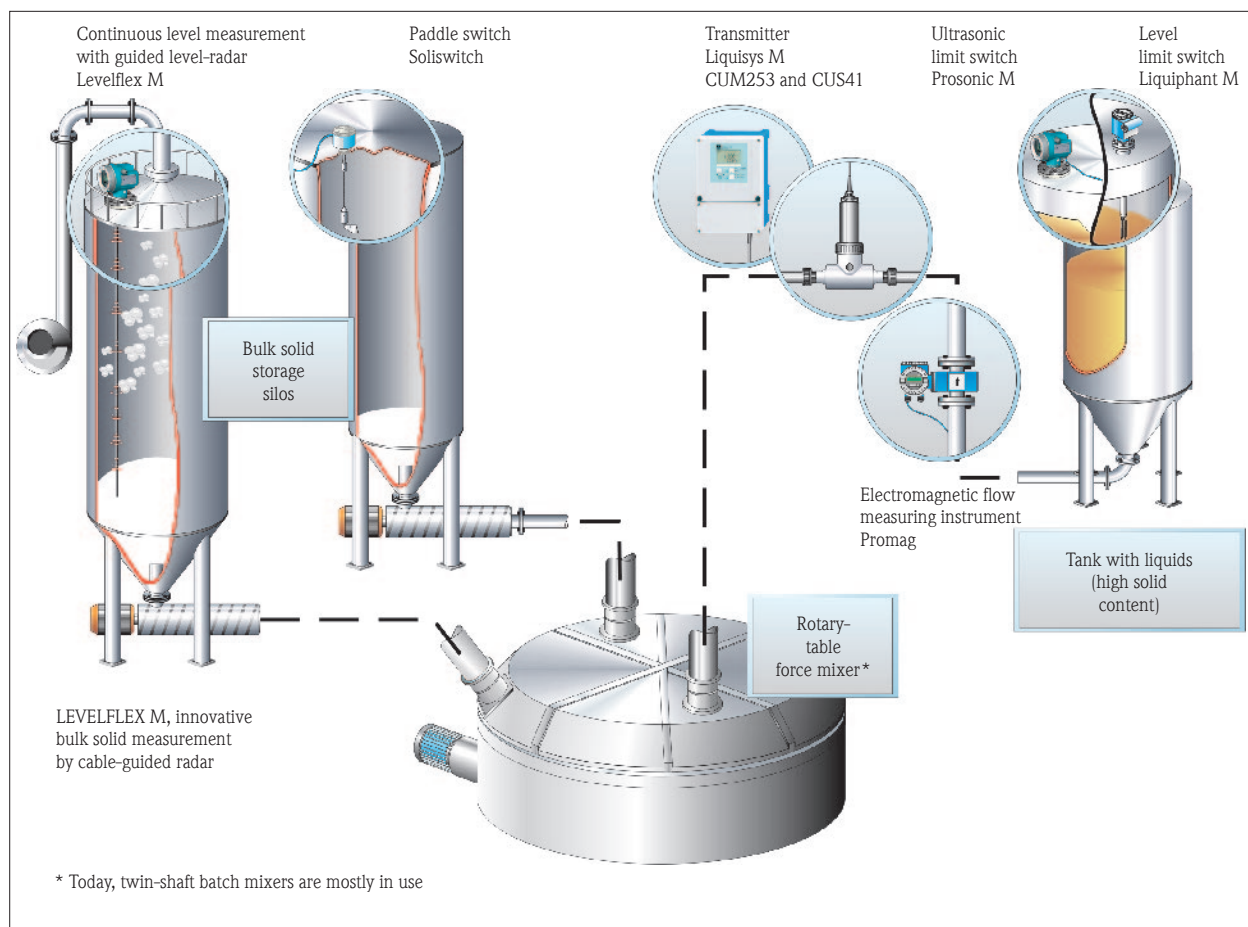
Endress+Hauser is a Swiss family enterprise with more than 6,000 employees serving customers in 37 countries world-wide. As a solutions provider the company has offered a wide selection of products and services for all process automation industries for more than 50 years.

Excellent products in relation to performance and price, as well as future-oriented services enhance the competitiveness of our customers to the highest degree of quality, safety and efficiency. Endress+Hauser sales and service companies as well as all produc-

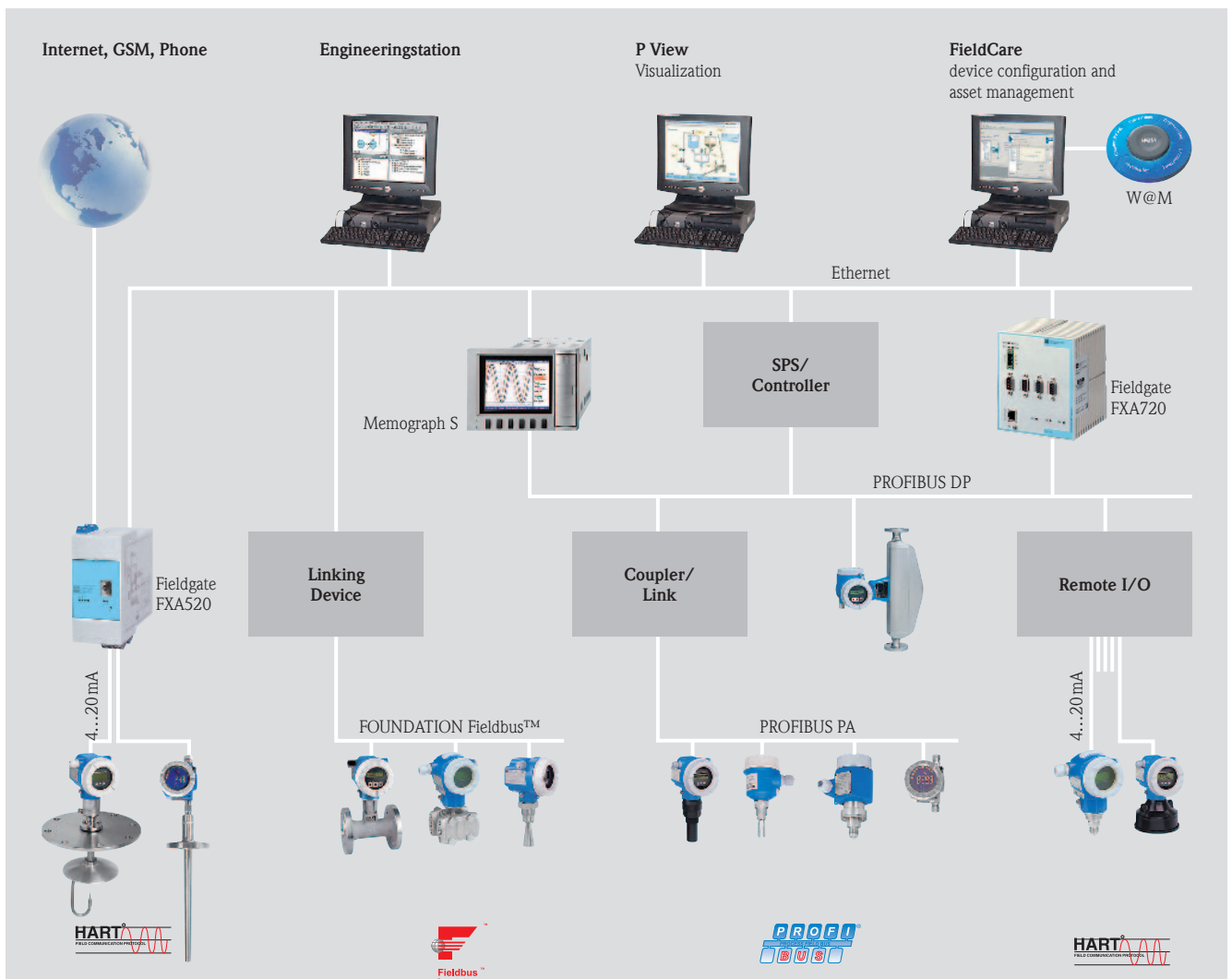
tion sites have been certified according to ISO9000 and the respective local manufacturing standards. Endress+Hauser stands for continuity, industry-specific know-how and long-term customer relations.

You can demand more from us because we provide complete systems. We offer a host of proven and comprehensive solutions, particularly in the area of mining cement and aggregates, which help you lower your costs and increase the efficiency of your plant.

Instrumentation for building material mixing systems



System integration/Field communication



PROFIBUS PA/DP and FOUNDATION Fieldbus™

PROFIBUS® and FOUNDATION Fieldbus™ are open fieldbus standards. They have been specially designed for process engineering and process automation purposes.

Endress+Hauser offers PROFIBUS® and FOUNDATION Fieldbus™ instruments for level, pressure, flow, liquid analysis and temperature measurement as well as recording devices.

Advantages:

- Standard is not dependent on a particular manufacturer
- Communication and power supply using two-wire technology
- Flexible topologies and bus structures

HART® protocol, e.g. via remote inquiry

In process instrumentation, the HART® protocol has become the standard for SMART transmitters world-wide. Together with a Fieldgate, the HART® protocol offers remote inquiry capability, remote diagnostics and remote programming. To this end, the Fieldgate uses the existing infrastructures of the Internet and software standards. Every Internet-compatible computer can request and represent measured values world-wide without any additional software.

The Fieldgate offers transparency in production and supply processes and opens up new possibilities in inventory management – e.g. time and cost optimized route planning for delivery vehicles.

Visualization and device configuration

The P View visualization system is a high-performance and price-effective customer solution for process visualization. Measured tank values such as level or temperature are clearly depicted.

FieldCare configuration and asset management software is based on the open FDT 1.2 standard (Field Device Tool) and provides easy access to field instruments from a central station irrespective of the manufacturer. FieldCare comprehensively supports engineering, configuration or setup and diagnosis of intelligent instruments. FieldCare makes an engineer's life easier, e.g. from quick access to device manuals through to plant wide status monitoring of all field instruments.

Instrumentation for applications in ...

Storage Silos for Aggregates

In vertical concrete mixing plants with compact silos or multiple-chamber cells the following measuring techniques are used for level measurements and limit detection:

Level Measurement

- 1 For various aggregates such as gravel – **Posonic S** ultrasonic system with FMU electronics and FDU sensor.
- 2 For binding agent, such as cement, fly ash (from hard coal power stations), as well as fine sand and powder up to approx. 4 mm – use the guided level radar **Levelflex M**.

Limit Detection

- 3 For maximum and minimum detection in medium to coarse-grained bulk-solids – use the robust capacitive **Solicap M** sensor.
- 4 For fine-grained to powdery solids like cement, compact capacitive sensor **Minicap**, with integrated active build-up compensation, available also with rope extension. Alternatively for maximum detection use the compact **Soliswitch** with either shaft extension or rope.

Material Flow Monitoring at Belt Conveyor Transfer Points

- 5 Quick detection of material blockage or backup on belt conveyors and transfer points with compact ultrasonic transmitter **Prosonic T**. The feed, e.g. belt conveyor, channel or sieves, can be switched off using a potential-free contact.

A two-point pump controller with a freely adjustable hysteresis can be controlled with the **Prosonic T** too.



Ultrasonic sensor
FDU



Soliswitch
paddle switch



Ultrasonic limit switch
Prosonic T

Prosonic S FMU field mount transmitters with weather proof ultrasonic sensors or **Prosonic M** compact transmitters for measuring aggregate level in star-sectioned bunker facilities (measuring range typically 3 – 5 m).



Level measurement in buffer silos for aggregates with Prosonic



The Levelflex M in action



Uniform software platform for easy instrument operation

- On site instrument programming without additional handheld terminals or PC's, all with the same menu structure
- Simple measuring point documentation "at the touch of a button" in PDF format
- Signal analysis and online operating help on the instrument display or using the freeware tools provided
- Time and cost savings due to our uniform operating philosophy for level, pressure and flow
- Simple menu-guided commissioning – no special training required

... the ready-mixed concrete industry

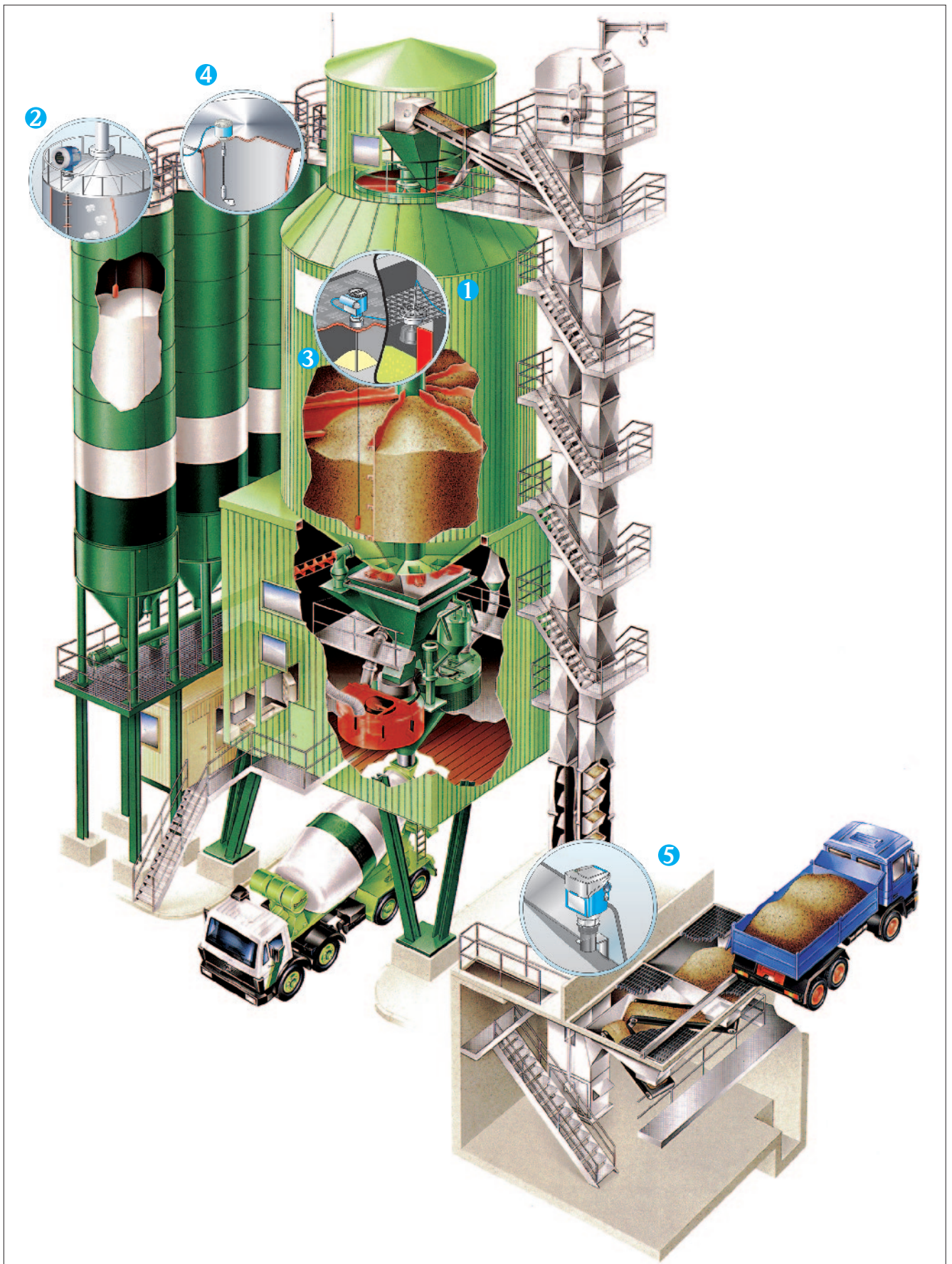
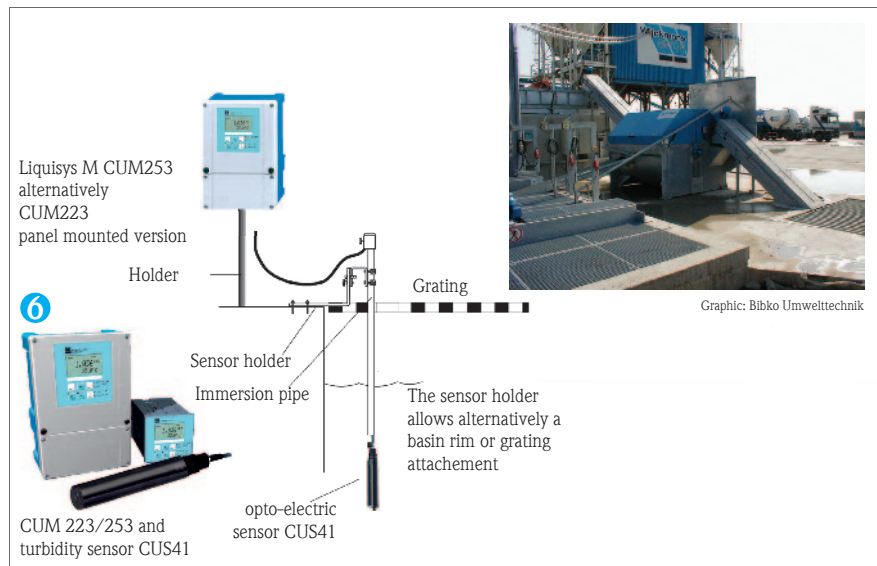


Photo: Stetter GmbH

Instrumentation for applications ...

Recycling process: Excess water and concrete mix together when washing out feed skips and trucks

If this water can be recycled and not sent down a drain, substantial cost savings can be made. The wash water from recycling installations is collected in agitator basins and is re-used for the production of fresh concrete. In addition to country specific environmental legislation, the new European Standard EN 206-1 for concrete production ensures consistent ready-mix characteristics and quality via improved process control.



6 Raw Density Measurement with Liquisys M

During production continuous measurement of the solids content and raw density of concrete ensures:

- Consistent quality by online adjustment of composition
- Optional temperature measurement of the wash water
- Optimized use of energy due to controlled cycloning



Installation CUS41/Sensor in the basin



Turbidity sensor CUS41 with Sensor holder

The concrete wash water package consists of a **Liquisys M** transmitter CUM223/253 with preset parameters for this application and **CUS41 turbidity sensor** installed with a holder which ensures simple installation without interruption of production.

Advantages of the measuring system at a glance

- Reliable measurement due to compact, shock-proof sensor design.
- Inclined flat surface uses medium flow to increase sensor self-cleaning effect.
- Scratch-resistant sapphire windows.
- Transmitter display directly of raw density with pre-calibrated data set for concrete wash water enables use up to a raw density of approx. 1.15 **without calibration**.



Liquisys M CUM253 with raw density plus temperature display.

... for recycling of concrete wash water

Water conditioning plant open up entirely new ways in which concrete is made. The quality of the concrete mixing water and the remaining water is improved using conditioning units so called induction generators.

By conditioning the concrete mixing water – lowering the viscosity and surface tension and by reducing the demands on the water – the quality of fresh and prefab concrete mixes is substantially enhanced. This is seen in improved processing, superior stability and reduced number of pores in the surfaces. In addition, a substantial saving of binding and additive materials results.

In addition to using raw density as a means of optimizing the concrete mixing process you can also use a viscosity measurement of the conditioning water and low metering

control for liquid recipe components (water, additives, pigments).

This combined raw density and viscosity measurement of the concrete wash water is carried out with the patented, single pipe mass meter, **Promass I**. A closed material circuit in the plant is the goal of waste concrete recycling systems. This is done by



The display reflects the dynamic viscosity in cStokes

Shown is an exemplary application, with the induction generator at the front



Photo: Condis Umwelttechnik

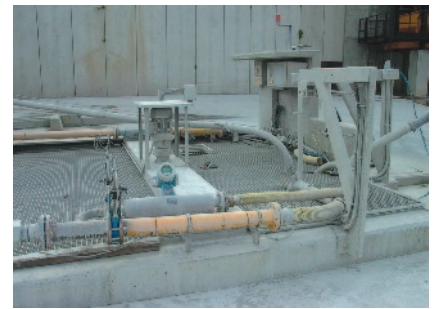


Photo: Condis Umwelttechnik



Photo: Bibko Umwelttechnik

Recycling machine with external batching buffer, for example in concrete transport companies with ground level conveying for concrete pumps.

mixing all waste materials such as excess concrete, mortar, anhydrites, wash water as well as rain and condensate waters.



Photo: Bibko Umwelttechnik

Level measurement with ultrasonic Prosonic for basin level plus relay control

Other applications:

Flow measurement

7 Measuring the flowrate of ready-mixed concrete or mortar using the **Promag S** electro magnetic flowmeter.

Controlling the mixing of chemicals, dyes-tuffs of setting agents using the **Promass** Coriolis mass flowmeter or the **Promag** magnetic flowmeter.

Pressure measurement

8 Measuring the hydraulic and conveying pressures, e. g. during the concretising phase, with **Cerabar S**.

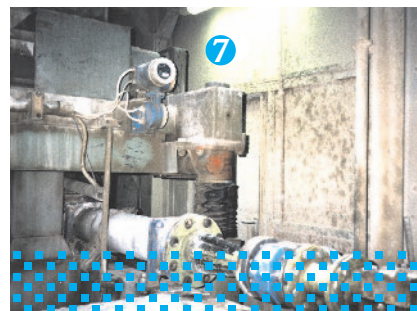


Photo: Putzmeister AG

Your one stop process automation shop

Consultation, implementation and support of measuring and automation systems for the cement industry

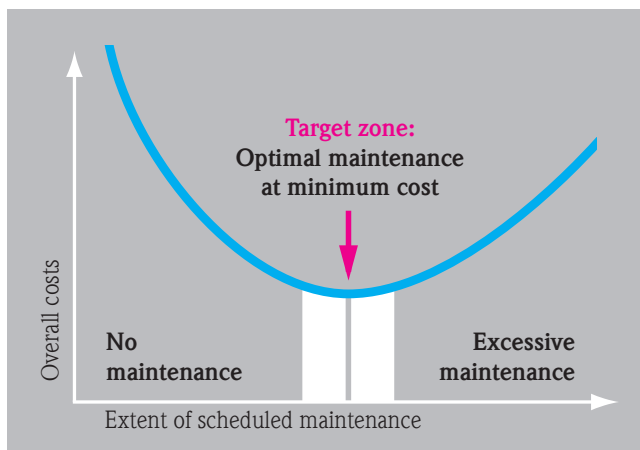
Optimized maintenance programs



Endress+Hauser maintenance and support programs aim to improve plant reliability. To this end, we work together with your maintenance staff to define relevant service intervals, schedules and procedures and the allocation of respective resources which best suit your plant. This maintenance strategy is based on an assessment of overall process instru-

mentation and takes in to consideration all systems and procedures relevant to quality and safety.

Our tailored support programs always take into consideration our customers' specific work processes and methods, the local technologies, as well as the experience and know-how of engineering staff. As a matter of course our service schedules and support measures will address your financial constraints and company.



«Too little maintenance» is just as critical as «too much» – Endress+Hauser helps you to find the right balance.

Co-operation and partnership

From consultation and commissioning through to operation.



Endress+Hauser is with you during the whole process as your partner in industrial instrumentation and plant asset management. The responsibility of Endress+Hauser does not end with instruments. We assume the overall responsibility for your plant. Be it fieldbus installation, remote instrument visualization, automation of processes or the realization of asset management installations – all of this is engineered by a partner you know well.

Our consultation services aim to provide the following:

- Cost reduction solutions by decreasing raw material and energy consumption as well as maintenance and down times
- Higher safety and fewer plant down times
- Solutions for a broader range of applications with fewer stocked instruments

Additional documentation

Industry documentation

Cement industry	SO 402B
Concrete industry	SO 401B
Gravel works and quarries	SO 405B
Mining industry	SO 403B

Product and service documentations

Level measurement	FA 001F
Inventory control – storage/supply processes	FA 003V
Service & Support solutions	FA 018H
System solutions	FA 001S
System components	FA 016K
W@M – web-based asset management	CP 001Z

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