

PILOT PLANT AND RESEARCH CENTER

CEMTEC
Cement & Mining Technology



GRINDABILITY

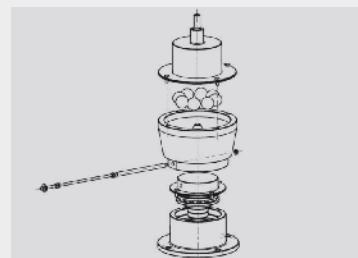
BOND TEST

The determination of the work index according to Bond is a method for characterizing the comminution performance of mineral and organic samples. The method is applied for the design of rod and ball mills.



ZEISEL, HARDGROVE

Determining grinding properties under the Zeisel and Hardgrove method serves to characterise the comminution performance of mineral and organic samples. The method is used, for example, in the design of vertical mills.



BATCH GRINDS

Besides the standard method according to Bond, it is also possible to record the specific energy consumption with batch mills to determine the grinding resistance. In doing so, a definite product fineness is established and the energy necessary for this measured.

Various options are available to vary this energy input.

- Mill speed
- Grinding media filling degree
- Grinding media shape
- Batching composition

These tests round off an optimum design of the mill with the work index as per Bond.

Five differently sized batch mills are available for the activities cited in our laboratory.



CEMTEC – your partner for success.

Demand for products with high quality standards and ever more specific requirements concerning the component parts of these products call for efficient solutions.

CEMTEC aims to adapt every stage of the process to the exact needs of the client – from the start of production to intermediate and finished products.

To achieve this, the grindability, energy requirement and chemical properties of the source material must all be determined.

To develop custom-made systems, the required properties are defined in our laboratory and technical center; this data is the precondition for further calculations and design parameters.



BATCH GRINDS



BM 0303 "ELLA" (BOND MILL)

Description: Ball mill for determining the grindability index according to Bond.

Diameter: 0.305 m

Length: 0.305 m

Minimum required sample quantity: 15-20 kg



SM 0306 "RESI" (BOND MILL)

Description: Rod mill for determining the grindability index according to Bond and power determination during the batch process.

Diameter: 0.305 m

Length: 0.610 m

Minimum required sample quantity: 20 kg



BM 0504 "FIFFI" (STANDARD BATCH MILL)

Description: Ball mill for the dimensioning of mills, power determination and product production.

Product quantity: up to 100 kg

Diameter: 0.5 m

Length: 0.4 m

Type of grinding: wet or dry

Minimum required sample quantity: 20-25 kg



BMK 0504 "GRETCHEN" (NON-FERROUS)

Description: Ball mill for the dimensioning of mills, power determination and product production. Mill shell and grinding media are made of Al_2O_3 .

Diameter: 0.5 m

Length: 0.4 m

Type of grinding: wet or dry

Minimum required sample quantity: 20-25 kg



BM 0809 "MINNA" (BATCH MILL)

Description: Ball mill for the dimensioning of mills, power determination and product production.

Product quantity: approx. 500-1000 kg

Diameter: 0.8 m

Length: 0.9 m

Type of grinding: wet or dry

Minimum required sample quantity: 70 kg



PILOT PLANTS

VERTICAL ROLLER MILL

VRM 600 "STEFANIA"

Description: Determination of the power demand for the dimensioning of mills; test grinds and customer presentations

Number of rollers: 3

Grinding table diameter: 670 mm

Circuit: closed circuit with integrated classifier

Discharge of coarse fraction: possible

Product fineness / D98: 20-120 µm

Minimum required sample quantity: 3-5 t



VERTICAL ROLLER MILL

VRM 200 A "ANDREA"

Description: Determination of the power demand related to the material to be ground and its fineness

Number of rollers: 2

Grinding table diameter: 200 mm

Circuit: closed circuit with integrated classifier

Discharge of coarse fraction: possible

Product fineness / D98: 40-120 µm

Minimum required sample quantity: 100-200 kg



VERTICAL ROLLER MILL

VRM 200 B "BARBARA"

Description: Determination of the power demand related to the material to be ground and its fineness

Number of rollers: 2

Grinding table diameter: 200 mm

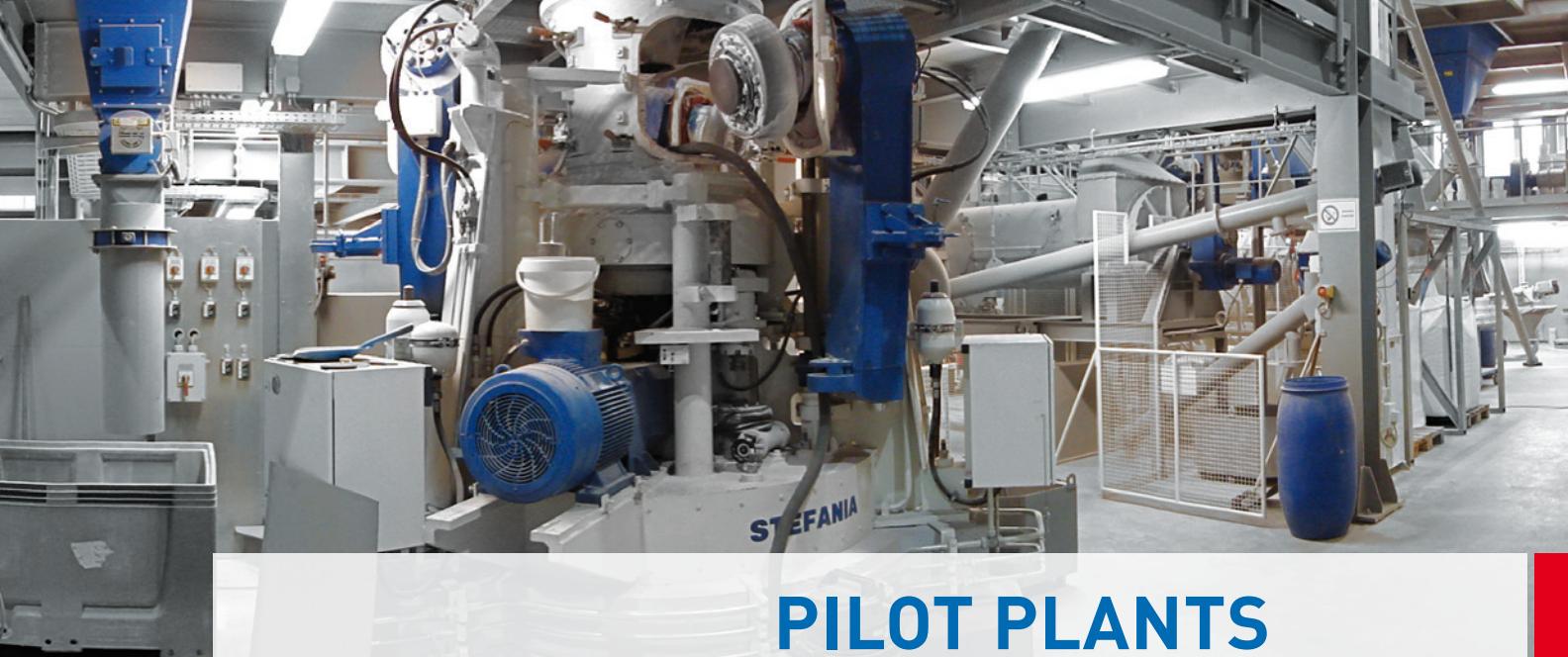
Circuit: closed circuit with integrated classifier

Discharge of coarse fraction: impossible

Product fineness / D98: 40-120 µm

Minimum required sample quantity: 100-200 kg





PILOT PLANTS



BALL MILL DM 1230 "DORIS"

Description: Design of large plants; use for customer presentations, research and development and test grinds

Diameter: 1.2 m

Length: 2.0 m, 2.5 or 3.0 m

Circuit: open or closed with screen, classifier or hydro cyclone

Type of grinding: wet or dry

Discharge: peripheral or grate discharge

Product fineness / D98: 10-150 µm (dry); 80-120 µm (wet)

Minimum required sample quantity: 3-4 t (dry); 5 t (wet)



ROD MILL SM 1220 "WALBURGA"

Description: Design of large plants; use for customer presentations, research and development and test grinds

Diameter: 1.2 m

Length: 2.0 m

Circuit: open or closed with screen

Type of grinding: wet or dry

Discharge: peripheral or grate discharge

Product fineness / D98: 200-2000 µm (open circuit)

Minimum required sample quantity: 5 t



OPEN CIRCUIT MILL DM 0607 "OLGA"

Description: Ball mill or rod mill for the design of large plants; use for research and development purposes; designed as overflow mill

Diameter: 0.60 m (ball mill); 0.45 m (rod mill)

Length: 0.70 m (ball mill); 0.65 m (rod mill)

Circuit: open or closed with screen or hydro cyclone

Type of grinding: wet or dry

Minimum required sample quantity: 300-500 kg



AGGLOMERATION

PELLETIZING DISC PTD 120 "FABIAN"

Description: Speed regulated pelletizing disc; automatically adjustable disc angle

Disc depth: adjustable to 150 mm, 200 mm or 300 mm

Disc diameter: 1.2 m

Minimum required sample quantity: 2 t



DRYING

DRYER TT 0950 "THEO"

Description: For drying and mixing applications; operated with hot gas generator

Diameter: 0.9 m

Length: 5.0 m

Burner power: 400 kW

Capacity: 300-1200 kg/h

Minimum required sample quantity: 1.5 t



CRUSHING

JAW CRUSHER BB 220 "KURT"

Description: Jaw crusher

Jaw width: 220 mm

Jaw depth: 180 mm

Capacity: 300-500 kg/h depending on grain size
(continuous feed)



LABORATORY AND ANALYSIS TECHNOLOGY



DENSITY

Possible determinations:

- bulk density loose and shaken
- apparent density by means of:
 - liquid pycnometers
 - helium pycnometers

SURFACE

We can determine the surface in our laboratory as follows:

- as per Blaine and
- using the BET method

GRAIN SIZE ANALYSIS

Possible methods:

- Screening by manual screening, screen tower and air jet screen
- Sedimentation process
- Laser diffraction by means of a Mastersizer 2000 of Malvern



MOISTURE DETERMINATION

Possible methods:

- Drying cabinet Tmax = 300 °C for sample quantity = approx. 50 kg
- AND MX 50 moisture analyzer for powdery nonflammable materials Tmax = 200 °C, Mmax = 10 g
- Laboratory kiln Tmax = 1300 °C



MINERALOGICAL CHARACTERISATION

Besides determining the physical properties, the characterization of mineral samples often requires a chemical analysis as well.

Possible methods:

- X-ray fluorescence analysis (XRF analysis)
- X-ray diffraction (XRD)

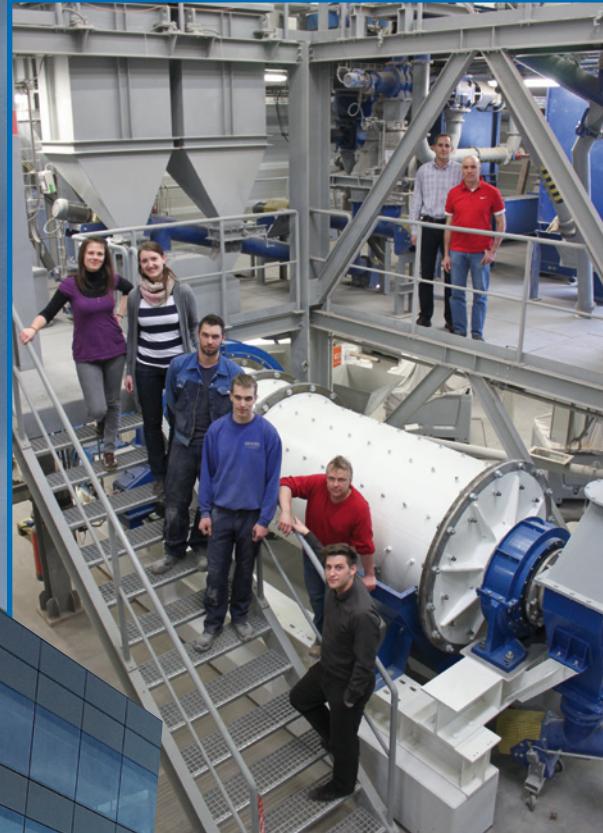
VISCOSITY

The Fann Model 35A Couette rotational viscometer measures viscosity at six speeds between 3 rpm and 600 rpm.

CEMENT & MINING TECHNOLOGY WORLDWIDE

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EACH PROJECT STARTS IN OUR PILOT PLANT!



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HEADQUARTERS



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