

AIR CLASSIFIERS FOR
CEMENT AND MINERALS
CTC SERIES

CEMTEC – your partner for success.

CEMTEC operates on the basis of individual responsibility. Each member of our team is authorised to make high-level decisions. The entire responsibility for a project – from planning to commissioning – rests with a single person. This means that you will have the same, competent contact partner for all your queries, wishes and suggestions, without exception. In addition to standard orders, your individual requirements can also be fulfilled rapidly and without complications.



CEMTEC HEADQUARTERS AT ENNS AUSTRIA

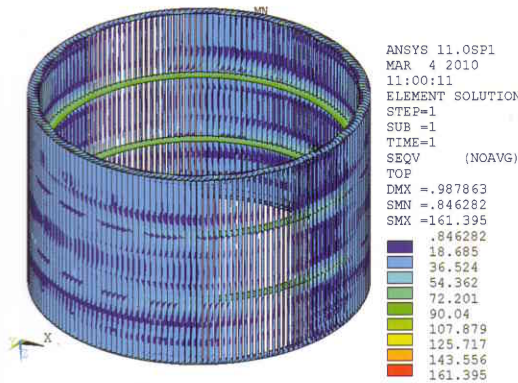
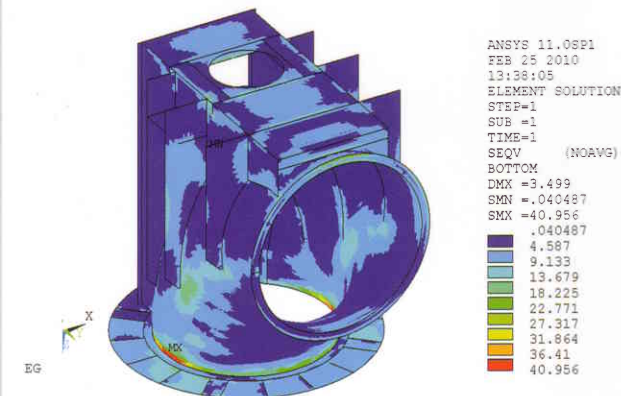
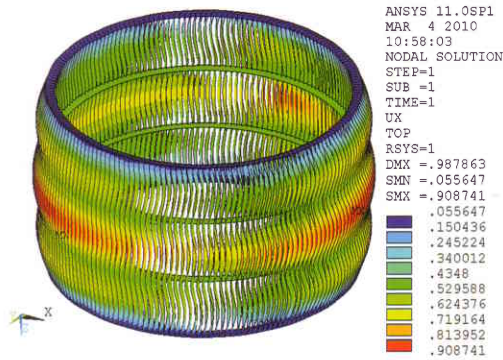
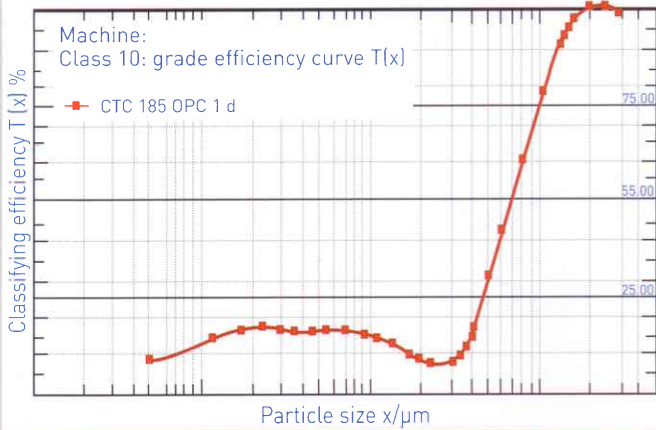
CEMTEC manages projects for the cement and processing industry worldwide.

CEMTEC supervises each project from start to finish. From planning to commissioning. Our product spectrum includes tube mills for grinding a wide range of bulk materials and minerals, as well as rotating drums for thermal treatment (calcination, drying, cooling) and mechanical processing (mixing, washing, conditioning, etc.) of different bulk materials. We also offer erection supervision, commissioning and technical support. Successful projects all over the world attest to the competence of CEMTEC.

Classification in new dimensions

The new CTC fine classifier series is based on the latest findings (4th generation) in the field of classification technology.

This series was developed by a team of experts with international experience and extensive know-how in machine and process engineering development and the design of air classifiers for classifying cement, slag, raw meal and other bulk mineral goods such as CaCO_3 or dolomite, together with the required steps such as reconciliation with the grinding unit and configuration of the corresponding peripheral equipment (materials handling, air technology, product transport).



CLASSIFIERS

The design of this series was geared to optimized production, operating and maintenance costs. This was achieved by new combinations of rotor geometry and improved flow design. It is expressed in classifying efficiency, low bypass of fines (see Tromp's curves) and the resulting reduced pulverization and classification energy.

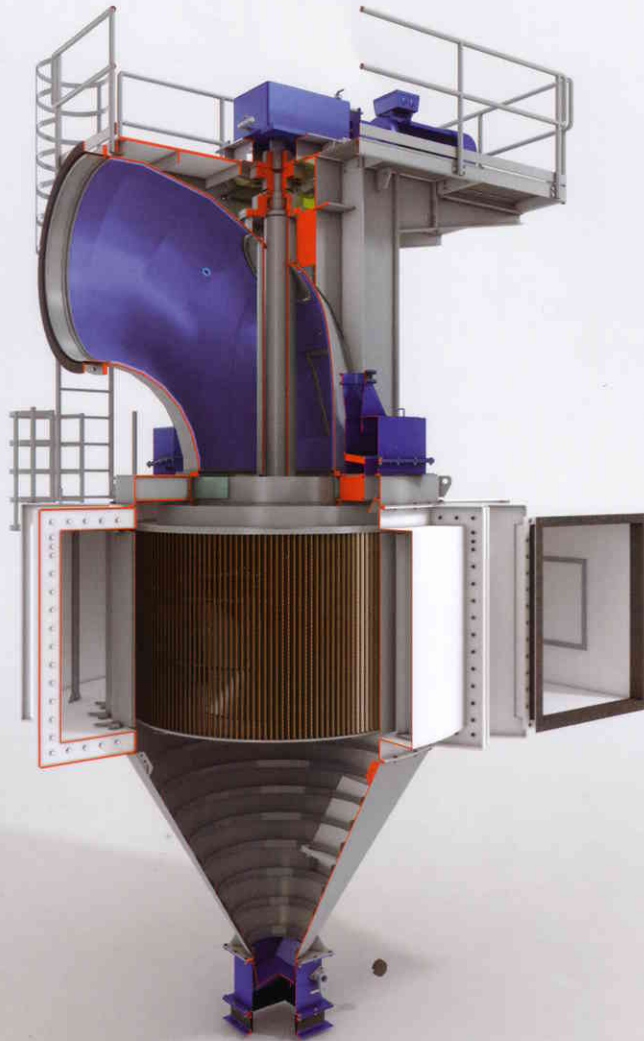
The corresponding stress design and optimisation by FEM simulations, together with vibration tests and modal analyses, guarantee the lowest possible maintenance costs on the one hand and optimised manufacturing costs on the other hand. This means that all series are designed so that the critical rotor speeds far exceed the maximum operating speed.

The optimised classification installation is supplemented by comprehensive advice for the required peripheral equipment, which plays a critical role in ensuring optimum production conditions.

Advantages of the CTC air classifier series

Extremely good top cut (d98)	due to specially formed rotor blades and rotor labyrinth with sealing air
Low vibration level	max. operating speed < n-critical
Low operating costs	due to low speed levels
Reduced pressure loss	due to optimised air-flow design (spiral housing and air guide vanes) and reduced speeds (curved rotor blades)
Reduced power consumption	due to reduced operating speed and pressure drop
Reduced wear	due to reduced operating speeds and optimised wear protection on areas subject to stress, due to use of high-strength steels, compound liner plates and highly wear-resistant HVFB coatings on exposed areas (depending on respective application)

ADVANTAGES



The newly developed CTC series (for fine industrial minerals $d_{98}=6-45 \mu\text{m}$) is a new and innovative design which guarantees peak production with the finest quality and optimised operating costs.

The modular built classifier permits optimum tailor-made solutions for CEMTEC ball mills and vertical roller mills.

Since the classifier series are modular, versions with air feed from below are also possible (combined with the CEMTEC vertical roller mill series) or as a standalone solution for tailor-made applications.

Detail-oriented, sophisticated and practical solutions secure a number of advantages which are reflected in quality, low installation, production and maintenance costs.

General function of the CTC series

The CTC series are designed as rod basket deflector wheel classifiers and geared to the varying requirements for cement, slag and raw meal classification. Particle sizes with a top cut (d98) as low as 30-25 µm are obtained for slag and cement.

In the CTC series the coarse fraction is fed into the classifying chamber via an air slide and distributor plate. The air flows tangentially into the classifying chamber via an aerodynamically configured spiral housing and air guide vanes, whereby the coarse fraction fed in from above is pre-accelerated and brought to rotor peripheral speed by the flow forces. In the classifying zone the coarse fraction is exposed for the main part to centrifugal, drag and flow forces.

In the classification zone the particles are subjected to two main forces

- centrifugal force

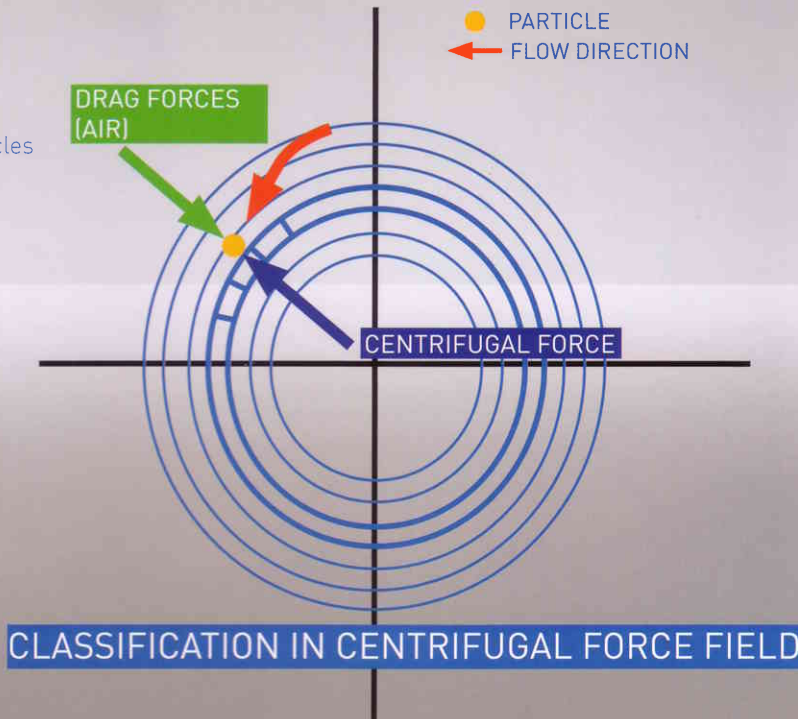
$$F_c = d_p^3 * \rho_p * R * n^2 * \pi^3 / 5400$$

and

- drag force of the air

$$F_w = d_p * 3\pi * \eta_g * v_{rad}$$

d_p	particle diameter
ρ_p	particle density
η_g	viscosity of the gas
v_{rad}	radial speed of the gas
R	radius of classifying rotor
n	operation speed (rpm)



FUNCTION

Centrifugal force predominates for particles larger than the cut size, and drag forces predominate for particles smaller than the cut size. The coarse particles fall spirally outside the rotor bowl into the coarse particle discharge, the finer particles are transported by the air flow through the rotor and fine particle discharge to the downstream classification devices.

In practice, the interaction of the classification forces is far more complex, because particle swarms (intensive dust clouds) rather than individual particles are subjected to the process.

With the appropriate engineering design the centrifugal force generated by the rotation of the classifier cage is amplified by effective flow configuration. This additionally reduces the possible cut size. The classifying rotor can then operate at a lower speed (with correspondingly less pressure loss).