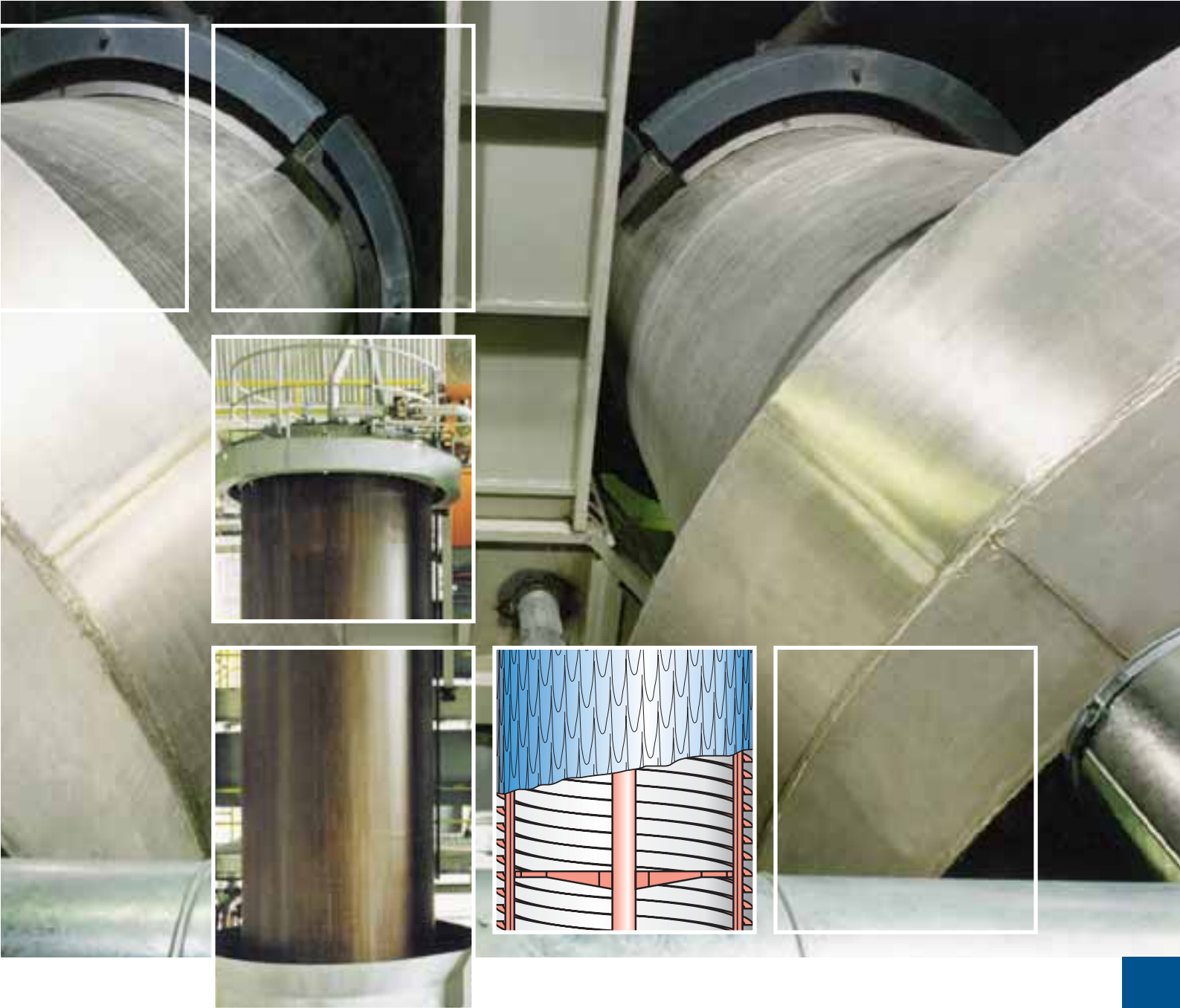


Polysius fines cooler.



A company of
ThyssenKrupp
Technologies

Polysius



ThyssenKrupp



Two fines coolers in a cement grinding plant.

Application

In grinding systems it is frequently necessary to reduce the temperature of the material being ground by installing an supplementary cooler. In many cases, indirect and thus gentle cooling processes are preferable to direct cooling, such as water injection into the mill. Indirect cooling does not affect the product quality.

The Polysius fines cooler employs the indirect cooling principle; i.e. the coolant evacuates the heat without coming into contact with the material being cooled. Depending on the system requirements, either the fine material, the circulating material or the grit rejected by the separator can be cooled. The Polysius delivery programme contains six different cooler sizes for throughput rates of up to 180 tph. The fines cooler is used not only in the cement manufacturing process, but also for cooling fine materials in other industries.

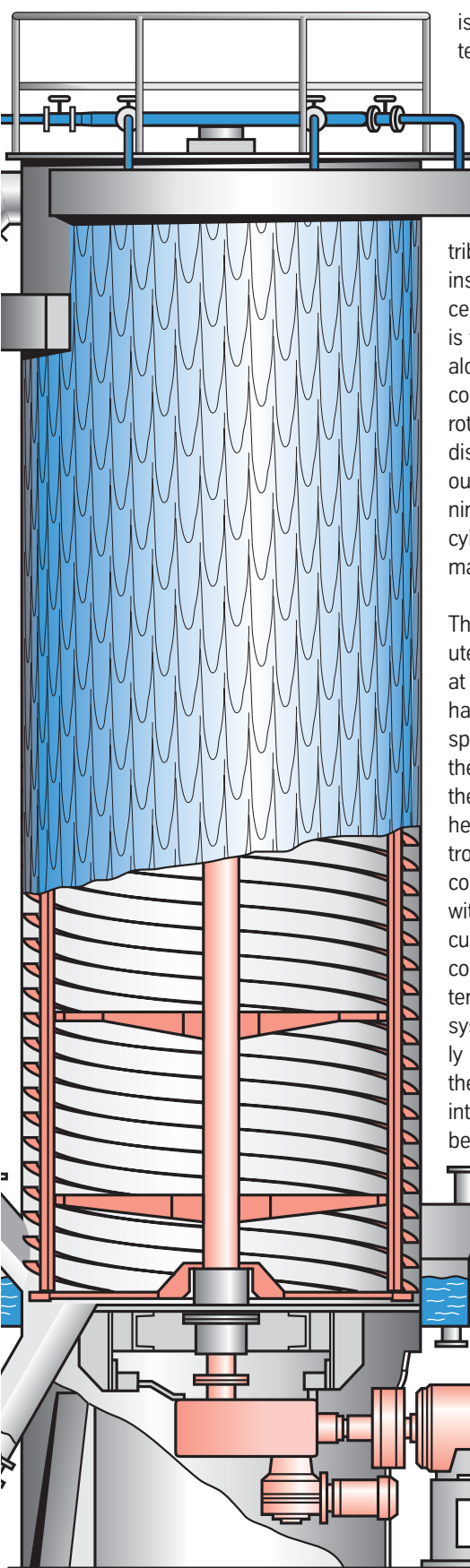
Design and principle of functioning of the Polysius fines cooler

The fines cooler consists of a vertical cylinder with external water cooling. Inside the cylinder, a rotor with adjustable spiral flights is mounted in antifriction bearings. It is turned from below by a bevel/spur gear unit. The entire drive unit is located at the base of the cooler and



Polysius fines cooler.

The gentle way to cool the product.



is easily accessible for maintenance purposes.

The material to be cooled is fed into the bottom of the cooler, falls onto the rotating distributor plate of the rotor and is distributed as a thin layer on the inside of the cylinder due to centrifugal force. The material is then conveyed upwards along the cylinder wall and continuously churned by the rotor flights until it reaches the discharge outlet. The continuously flowing film of water running down the outside of the cylinder efficiently cools the material during this process.

The cooling water is distributed by annular water boxes at the top of the cooler, which have conical guide plates to spread the film of water over the surface of the cylinder. At the bottom of the cooler, the heated water is collected in a trough and discharged. The cooling process can operate with either fresh water or recirculating water that has been cooled down to the required temperature in a re-cooling system. If, for instance, slightly salty water has to be used, the components that come into contact with the water can be made of stainless steel.

Main advantages of this cooler:

- Due to the intensive contact between the material and the water-cooled cylinder, good heat transfer is assured in spite of the relatively small dimensions of the cooler.

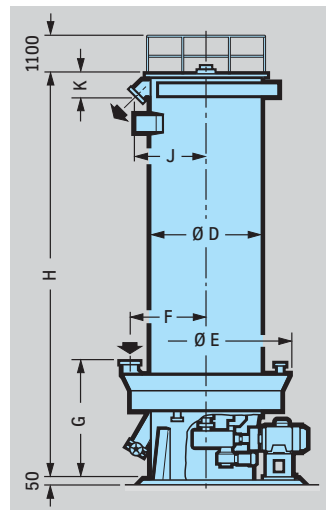
- The forced movement of the material prevents deposits from forming.

The cooling capacity of the system depends on the individual application. Selection of the cooler size to suit the application is based on the following data:

- throughput,
- material inlet temperature,
- cooling water inlet temperature,
- required material outlet temperature or amount of heat to be dissipated.

The compact construction of the fines cooler assures straightforward installation in both new and existing plants.

Drive unit of the fines cooler.



| Cooler size | I | I A | II | II A | III | III A |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Nominal dimensions | ø 2.0 x 5.5 | ø 2.0 x 4.0 | ø 2.5 x 6.5 | ø 2.5 x 5.5 | ø 3.2 x 8.5 | ø 3.2 x 7.0 |
| Heat transfer area (m ²) | 34 | 25 | 50 | 42 | 85 | 70 |
| H (mm) | 7620 | 6190 | 8660 | 7540 | 11100 | 9644 |
| Max. throughput | 75 t/h | | 130 t/h | | 180 t/h | |
| ø D (mm) | 2000 | 2000 | 2500 | 2500 | 3200 | 3200 |
| ø E (mm) | 3170 | 3170 | 3770 | 3770 | 4468 | 4468 |
| F (mm) | 1450 | 1450 | 1725 | 1725 | 2100 | 2100 |
| G (mm) | 2580 | 2580 | 2670 | 2670 | 3160 | 3160 |
| J (mm) | 1290 | 1290 | 1550 | 1550 | 1930 | 1930 |
| K (mm) | 400 | 400 | 430 | 430 | 490 | 490 |