

What is „Double Cross Cutting Action“?

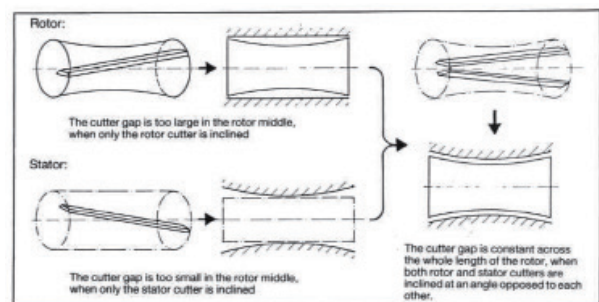
HERBOLD applies the new cutting geometry made possible by the double cross cutting action to almost all the granulator models available. The expression „double cross cutting action“ led to some confusion in the past which is partly due to the misleading descriptions used by other machine manufacturers. They often speak of double cross cutting action when only the rotor cutters are mounted at an inclined angle (either alternate inclination or ‚V‘ mounted). In our opinion this expression is only justified, if the machine operates with a true cross cutting action, and this is only the case when both rotor and stator cutters have been mounted inclined to each other.

Intensive production process - for intensive size reduction

The inclined mounting of both of the cutters results in very expensive production costs, as not only the rotor but also the housing has to be milled at an angle in individual production processes. The reason why HERBOLD pays so much attention to this aspect is quite evident upon closer examination:

The cutting gap is constant over the complete width of the cutter

The sketch clearly displays the problem that arises when only the stator cutter is mounted at an inclined angle: The cutting gap varies across the length of the cutter. To correct the geometric fault caused by the inclined mounting of a single cutter set, it would be necessary to use cutters with curved cutting edges. This would make the cutters too expensive to produce and to re-sharpen. It is only possible to achieve a cutting gap that remains constant at all points along the length of the cutter by mounting both rotor and stator cutters at inclined angles to each other - and to do so by using conventional straight cutters. This guarantees not only the size reduction of thin film without problems but also the grinding of thick-walled pieces with a minimum of fines. Many granulator manufacturers are unable to position the stator cutters at an angle because of the form of their machine housing. This is often the case when the housing is cast or when



rectangular stator cutters (block cutters) have been installed. These machine manufacturers advise against the use of inclined cutting angles in difficult cases and recommend parallel rotor and stator cutters - as far as we are concerned, this is turning back the clock of development. Even granulators with only one set of cutters mounted at an angle operate much more efficiently and have been in use for more than a decade now.

Lower power consumption using double cross cutting action

The inclined mounting of both rotor and stator cutters resembles a scissor-like cutting action and results in a lower power consumption.

Less sensitive to overloading, better material flow and higher throughput with double cross cutting action

These machines are less sensitive to overloading, i.e. a blocking of the rotor. More material can be

fed into the unit at a time, thus giving the operator time to carry out other tasks such as binding sacks or unloading material. It is often possible to completely fill the granulator so that the feed material gets automatically drawn in from the feed hopper over a period of time. So, this method of operation increases the throughput of the granulator.

A lower noise level with double cross cutting

High noise levels resulting from air that gets trapped and compressed inside the cutting chamber are eliminated by using double cross cutting granulators. The air in the chamber can escape when the rotor is turning, since the cutters are only in contact with each other at one point at a time. No increases in noise levels are to be detected, not even when a high-powered suction blower is being used.

When size-reducing elastic products (e.g. PE film or soft PVC injection moulded pieces) with a low material splitting noise it is possible to reach a noise level below 85 dB(A) without using any sound protection.

Less cutter wear with double cross cutting granulators

Since the cutters are in contact with each other only at one point at a time, the cutter wear is less than in any other type of granulator.

Disadvantages?

Up to the present day we have noticed no disadvantages in the use of this cutting system: Three questions, however, have repeatedly been asked with regard to this aspect:

1. Is the cutter adjustment more difficult?

Answer: No

On the contrary, when the cutters are pre-adjusted outside of the granulator. The stator cutters for granulators with rotor types L, A or O need only to be pushed into the machine; the adjustment is carried out at both ends of the cutters.

2. Does the rotor force the material to be transported to the sides of the grinding chamber?

Answer: No, because the stator cutting angle compensates for the material's movement to the sides caused by the rotor.

3. A maximum of two to three stator cutters is possible in granulators fitted for double cross cutting. Does this cause a reduction in throughput or shorten the service life of the stator cutters?

Throughput: An increase in the number of stator cutters (even by using more than one row) does not result in a linear increase in throughput. The use of more than three cutters results in bad adjustment, since they will have to be mounted in the upper section of the granulator then which often does not lead to any increase in throughput whatsoever.

Service life: The service life of the stator cutters is shorter, but not shorter than the life of the rotor cutters. This is due to the obtuse cutting angle of the cutters.

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