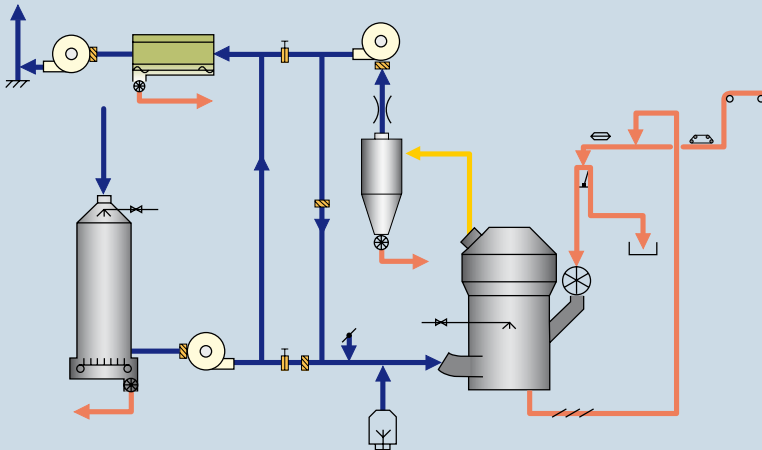
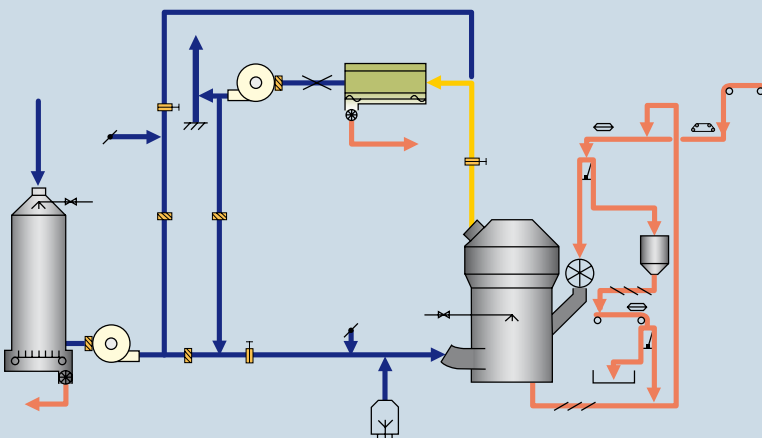


Flow sheet

Three-fan system (a)



Two-fan system (b)



Material flow Mill air flow Material + air flow

Layout of a) three-fan system and b) two-fan system. System b) is provided with feature to minimise handling of rejected material with metallic objects.

There is a number of arrangements for raw material grinding systems involving vertical roller mills. The various systems are different as regards placing of gas conditioning tower and dedusting of the mill vent gas. However, they can all be categorized as either three-fan systems or two-fan systems.

A three-fan system uses cyclones to dedust the mill vent gas. This arrangement reduces the operating suction and usually

also the gas volume for the filter, which may be either an electrostatic precipitator or a filter of the baghouse type.

The two-fan system uses a dust collector – an electrostatic precipitator or a baghouse filter – which takes the mill exhaust gases directly, reducing the number of drives and simplifying the system.

The type of system is selected based on specific plant conditions. However, the three-fan system is the most common of the two systems, providing better operational control with less interaction between operation of mill and kiln respectively. For the two fan system, the required size of filter must be foreseen for the total mill air flow, which is normally significantly higher than the kiln gas flow.

Mill feed arrangements: Either of the two systems shown can be provided with basically two different arrangements for feeding of the raw materials to the mill.

The most simple arrangement is the one that is shown in the flow sheet for the three fan system. When the metal detector for the mill feed material activates the change over gate at the mill inlet the feed material containing metallic objects will be rejected to a reject container, or simply to a reject pile.

When a high amount of metal parts is foreseen in the mill feed, a refinery material system as shown in b) will be advantageous. This improved system comprises a reject bin, a small conveyor system and an additional metal detector. Material is extracted from this bin at a very low rate to a conveyor belt provided with a second metal detector. When metallic objects in the extracted material are detected a second change over gate will be activated to reject a small amount of material containing the metallic objects to a reject container or to a reject pile. Due to the low extraction rate from the reject bin the amount of material rejected to container or pile will thus be reduced to a minimum.