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## Safety considerations when purchasing a stand-alone coal mill grinding system

When a complete clinker line is purchased the attention paid to the details of the coal grinding system with regards to explosion and fire protection will usually be limited to a list of standards, codes and rules to be complied with by the supplier. However, when new coal grinding systems are purchased for existing lines, the situation is similarly complex. Vincent Grosskopf of Coal Mill Safety asks some pertinent questions...

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In the European Union (EU) compliance with the ATEX Directives, to be complied with by both the supplier and the user, is compulsory. In North America, compliance with the relevant NFPA standards and codes are necessary.

The relevant list of standards, codes and rules will normally be provided by the company that has made it into the final round of the purchaser's discussions with suppliers. By making the adherence to the listed rules compulsory, along with a certain trust in the company that wins the order, the purchasing party will usually consider its part done.

In the EU, the future user of the system has to ensure that the part of the ATEX Directives that is

to be followed is incorporated in internal rules for use of the equipment and that the chosen equipment enables the user to comply with the ATEX Directives.

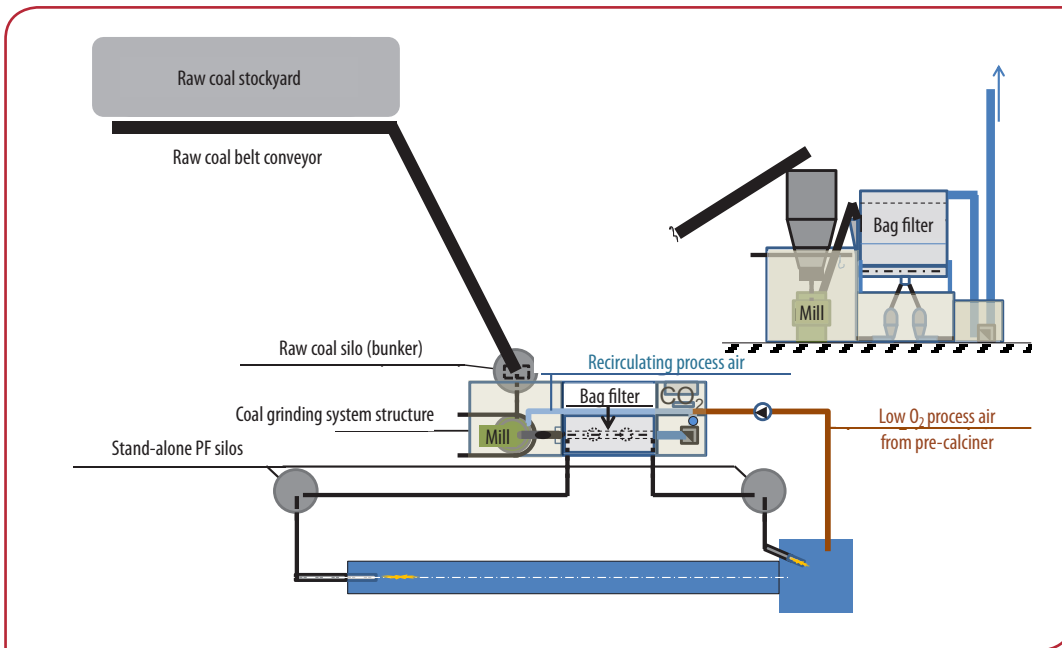
### Buying a stand-alone coal system

In cases in where a coal grinding system is purchased as a stand-alone unit as part of an expansion, retrofit or change in the fuel feed, the attention paid to the details of the coal grinding system in regard to explosion and fire protection could be expected to be even more intensive. However, this will normally not be the case. In practice, the resulting system will not be different from a coal grinding system that has been realised as part of a complete new clinker line.

Under these circumstances, it cannot realistically be expected that the purchasing party has the expertise to judge the explosion and fire protection-related details of the offer from the suppliers. It would also be unrealistic to expect the sales engineers of the

**Right:** Despite the use of oil and gas in many regions and the rapid rise of alternative fuels, coal remains the major cement production fuel. It must be safely handled when ground and fed into the kiln and, even though it is a difficult topic to broach, the onus to have the conversation is on the cement producer.





**Left:** Example of a modern coal mill system design. There are many areas that need to be considered during the design of a coal grinding system in terms of safety and efficiency.

suppliers involved in the finalisation of the contract to have in-depth knowledge of explosion and fire protection for coal grinding systems.

As a result, the knowledge that is available in the teams of the suppliers will not be at the centre of in-depth discussions between the parties. At best it will be in the heads of internal engineers working in the background. The purchasing party will, in most cases, take it for granted that the supplier knows what has to be known.

**It's good to talk**

For in-depth discussions to get started, the necessary detail and expertise has to be available to the persons at both sides of the table, which it normally is not. In-depth discussions therefore will not take place. And what are the different interests of the two parties?

**The supplier**

- To implement a problem-free system, with the time frame and budget not exceeded and guaranteed process-related figures met;
- To produce a system that contributes to a good reputation in the market;
- To contribute to its profit.

**The purchaser**

- To receive a problem-free system, with the time frame and budget not exceeded and guaranteed process-related figures met;
- To limit the costs of in-house contributions on site;

*Will the supplier's 'old' design cause unnecessary costs on the purchaser's side, in terms of footprint, excessive civil engineering and larger than necessary construction works?*



- To receive good support from the supplier during the construction of the system, during which the purchaser has to contribute most to the local works.

There would be conflicts of interest here if the purchasing side had the knowledge, interest and energy to ask some critical questions during the time in which the design of the system is selected but the contract is not yet signed. It is assumed all too easily that the supplier's willingness to accept the list of standards, codes and rules will lead to a correctly protected system. The standards, codes and rules don't completely cover the needs for protection and parts of these are complicated. Ways to skip complicated requirements have found their way into designs. These are hard to correct, since these 'solutions' have often been used for decades, with those responsible often unaware as to why they are wrong. The potential for conflict becomes clearer when the following questions are asked:

- Is there a reason for the purchasing side to be glad that the supplier has supplied a coal grinding system in the past that is approximately comparable with what is needed, so that that design of that system can be used again?

- Is it a good idea to ‘swallow’ the line that only the use of that existing design will prevent the time frame and the budget being overrun?
- Is it a good idea to help the supplier to use that existing design to save costs on both sides, as the supplier says it will?
- Will the supplier’s ‘old’ design, due to not being modernised, result in unnecessary costs on the purchaser’s side in terms of a bigger than necessary footprint, excessive civil engineering and larger than necessary construction work?
- Short distances for the processed material and process air throughout the system;
- A simple, largely open structure with as little concrete and steel construction work as possible;
- Silos (for raw fuel and pulverised fuel) that are not inside the closed or cladded structure;
- Main baghouse not included in the closed or cladded structure;
- Optimised platforms, gangways and stairways for access and weather protection for maintenance, as well as weather protection for key pieces of equipment.

The costs of the purchaser’s contribution to the overall job will hardly ever be questioned during discussions that lead to the contract but these cannot be changed after the contract has been signed.

To radically change the design of coal grinding systems, without changing the production process proper, the suppliers would have to undertake significant work to replace their often decades old designs. This long overdue work would be beneficial to all parties involved and help shape a better future in terms of lower costs for realisation, operation efficiency and lower maintenance costs.


The modification of system designs would have to include modifications of explosion and fire protection, especially in the parts which historically suffered from unclear or complicated standards, codes, and rules and therefore were often incorrect.

**Apply some pressure**

A modern coal mill system is characterised by:

- A small footprint;

In order to get modernised and improved coal mill system designs, the users will have to exert some pressure on their suppliers, and some external input will be needed, especially when it comes to the implementation of correct explosion and fire protection in the modified systems.

Although, over the last 40 years, equipment like vertical roller mills have unquestionably improved, the modernisation of the concepts of indirect firing coal grinding systems, in which they are used, has not. The initiative that would lead to modernisation of coal grinding system concepts undoubtedly has to come from the user side. Coal mill system design has to be critically questioned and nothing can be taken for granted. Questioning has to take place at the earliest stages of planning, which requires interest and energy. When the answers for individual situations are based on the individual characteristics of a given cement plant, both suppliers and users will benefit. 



**Below:** The Sinai White Cement plant in Egypt. Many Egyptian cement producers have rushed to use coal in recent years following a curtailment of gas subsidies. Have corners been cut in terms of safety in the quest for speed?