

Energy recovery and emission reduction

Why eco-process?

During the production of compound feed, high-energy mass flows are produced at different points of the process which are discharged into the environment at present and therefore cannot be used in the process.

The aim of the KAHL eco-process is to recycle the heat content of these mass flows into the process and thus to reduce the demand for live heating steam. Besides, the eco-process ensures a significant reduction of the emission of odours.

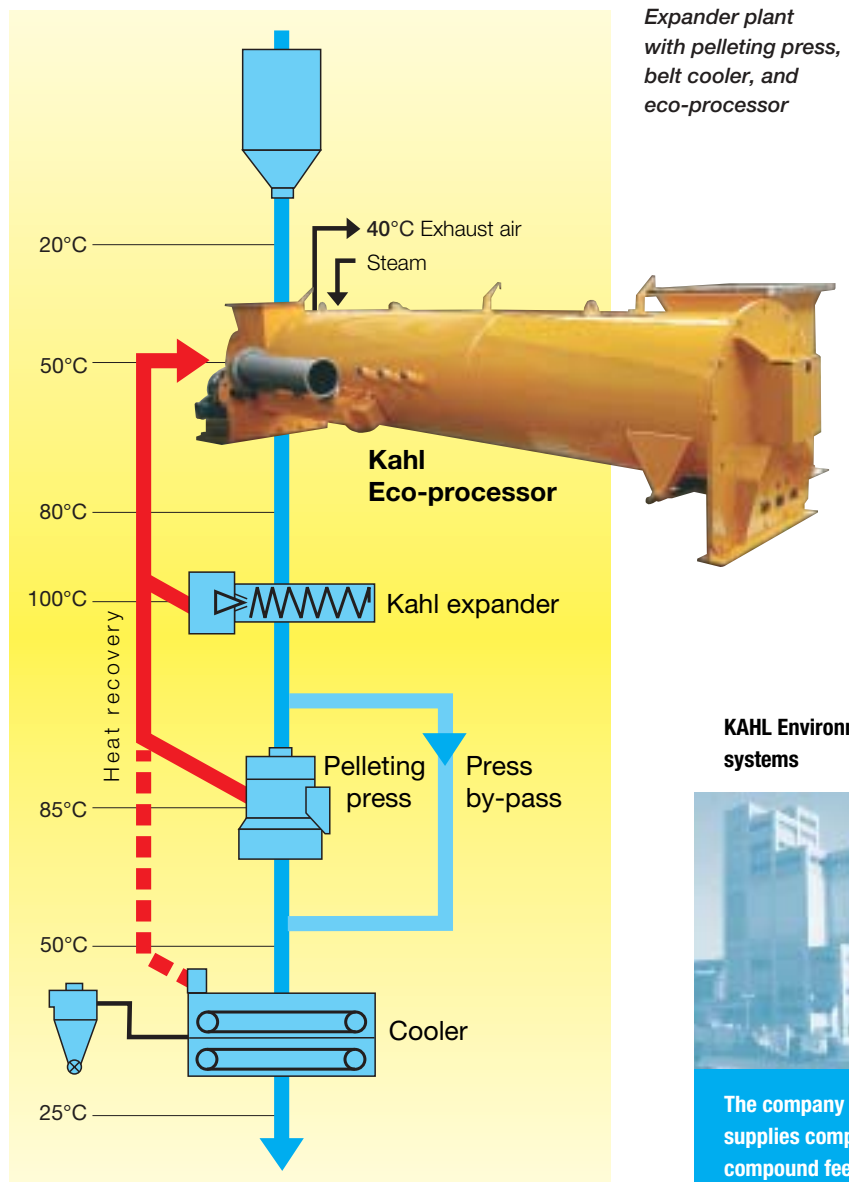
The eco-process

If an expander is used alone for the production of Expandat or in combination with a pelleting press, the conditioned product (75-85 °C) is further heated due to the subsequent input of electromechanical energy. The higher the amount of introduced energy in the expander / expander + press is, the more vapours will develop at the outlet of expander and press according to the laws of thermodynamics.

The belt cooler is a further source of emission of exploitable waste heat. On account of its design and operating mode, a belt cooler is particularly appropriate for recycling of high-energy vapours. This is not possible in case of a counter-current cooler as there is a mixture of all states of air at the outlet.

Advantages of the KAHL eco-processor system:

- Emission of odours reduced by 20-80 %
- 30 - 50 % product pre-heating due to vapour recycling
- Due to 30-50 % steam saving also 30-50 % CO₂ reduction
- Smaller steam generator
- Lower water consumption due to 30-50 % steam reduction
- No formation of condensate
- Low dust emission



Expander plant with pelleting press, belt cooler, and eco-processor

KAHL Environmental systems



The company KAHL supplies complete compound feed factories, plants, and machines considering ecological processes

KAHL Eco-process

Heat recovery

These vapours are almost pure steam with a high specific energy content. They condense spontaneously and completely on colder product surfaces, the condensation heat being released as usable energy. In order to use this effect technically, our eco-processor has been developed.

Due to this process sequence a part of the heating steam requirement can be covered in the eco-processor by means of the recycled vapours. Live steam is saved.

In case of a gentle operating mode, 15-20 % of the live steam quantities required in the conditioner can be saved using the eco-processor.

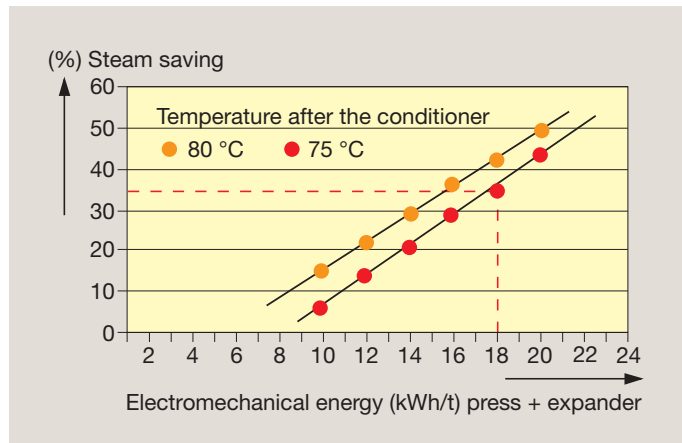
This value can be increased depending on the process sequence (see diagram). A steam saving of almost 35 % is possible, for example, if the product temperature after the conditioner at the expander inlet is abt. 75°C and the system expander + press introduces a total of 18 kWh/t of electromechanical energy into the product.

Odour reduction

As many odorous substances are water-soluble, they adhere to the vapours and are recycled into the product during the condensation of the vapours in the eco-processor. In a production plant for pig feed an odour reduction of 37 % has been measured. In case of rations with a high fishmeal content odour reductions of up to 80 % are possible.



Eco-processor



Relation between the outlet temperature of the conditioner, the electro-mechanical energy introduced into the product via expander alone or expander + press, and the max. possible live steam savings resulting from the use of the eco-processor.

KAHL Eco-process

■ Steam saving

According to the operating mode of the system expander or expander + press and depending on the energy cost in the respective countries, steam savings are achieved thanks to the eco-process which can result in pay-back times of less than two years in terms of investment and operating cost.

■ Odour reduction

Depending on the initial quantity of volatile odour-bearing feed components and the operating mode of the production process, an odour reduction is possible to almost the extent that is achieved in biofilters.



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