

## Huge impact with green investments

For secluded potato processing factories, smell and vapour emission have never been given any problems before, but according to the current environmental rules, more requirements regarding emissions generated by the industry are a reason for potato processors to reduce visible vapour and invisible smell emission. One such company looking to reduce their emissions was the Belgian company Ecofrost, where two French fry production lines and one specialty line are in operation.

Together with Ecofrost we searched for the most effective way to cover vapour and smell reduction and decided on the necessary measures. Basic principal; minimal environmental impact and maximum improvement for the environment of the manufacturer.

First the emission of the steam peelers is handled. The blown-off steam of the peelers is transported to a condenser vessel, where the steam will be condensed. By condensing this steam, most of the smell is collected and much energy will be released. This energy is converted into hot water which will be used as a heating device in the processing lines. The formerly large visible steam plume is strongly reduced in volume and is almost invisible.

The dryers and the vapour hoods for the dryers are another large vapour and smell source. At the dryers, smell occurs mainly in the first section. Caused by the wet surface of the potato products (French fries) due to the sticking moisture of the additive dip system with SAPP and/or dextrose. This sticking moisture is evaporated in the first section of the dryers. This does not only emit a lot of smell out of the extracted air, but also causes much pollution in the dryer cabinets.

By using a WaterVac® for the infeed of the dryers, the sticking moisture is removed. The WaterVac® ensures that:

- The vapour hood minimizes vapour because the sticking moisture is reduced.
- In the dryer the sticking (smelling) moisture no longer has to be evaporated, only the moisture from the potato, which causes less smell.
- As the sticking moisture no longer has to be evaporated, the energy consumption in the dryer will decrease.
- Less pollution will occur in the first dryer section, so it is possible to use internal heat exchangers underneath the dryer belt to achieve a more even drying process.

An additional benefit of installing a WaterVac® is that the removed sticking moisture can be re-used in the additive dip system. This will decrease the use of SAPP and/or dextrose. The waste water will contain much less phosphates, a positive development from an environmental point of view.

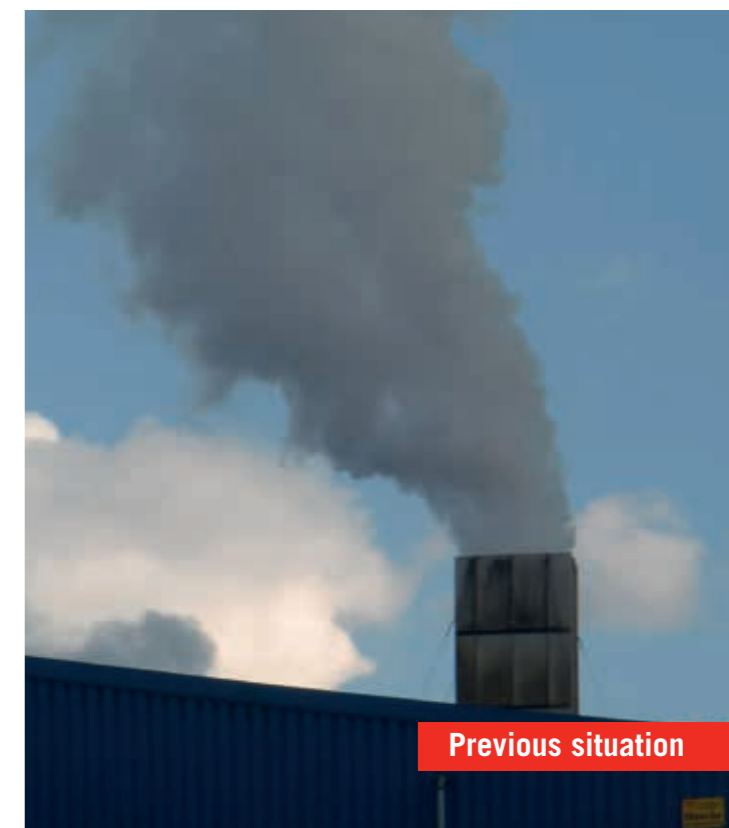
The fryers are the third source of smell and emission which have to be dealt with. These not only provide the largest possibility of reducing vapour and smell, it is also the largest source for recovering energy. In a frying vapour condenser the vapours are transported through a heat exchanger. The moisture which evaporates out of the French fries, is condensed. Also during condensing, most of the smell from the extracted frying vapours, are removed. To clear the remaining frying vapours of smell, these vapours are passed through an air centrifuge.

Every hour between 6.000 kg to 9.000 kg steam is condensed in the frying vapour condensor. The amount depends on the products Ecofrost produce at that time. The condensed steam (water) has a relatively high temperature. This water is cooled down in a heat exchanger before it is transported to the water treatment. The released energy will be used in the production process.

In the water treatment, the water coming from the frying vapours, is filtered from frying oil parts, so that it can be re-used in the production process. This provides a saving for Ecofrost and for the environment in the consumption of fresh water.

The energy which is recovered from the frying vapours and from the emission of the steam peelers is more than enough for the complete drying process. By using this available energy in the dryers, more moisture will be removed from the French fries during drying. This shortens the frying time in the fryer, less energy is needed for frying and obviously the French fries still meet the required product specifications.

The final part of the green investment in the French fry line is the installation of the Oil Miser®. This machine removes the sticking oil from the French fries by using circulating air and transports the oil to the fryer for re-use. By bringing in the Oil Misers® the amount of frying oil on a yearly basis will decrease enormously. This is obviously a saving for Ecofrost and also good for the environment because less oil, mostly sunflower, is needed.



A saving of high-quality vegetable raw materials. In addition it is immediately visible that less fat will be on the cooling and freezing tunnel belts, also the packaging is considerably cleaner. Fat on the product acts as an insulator and without this fat the capacity of the (IQF) freezing tunnel will increase, or, at a constant capacity, the energy consumption in the cooling process will decrease.

Since less fat remains in the cooling-freezing tunnel and in the packaging, the cleaning of these units will go considerably faster. Less fat will come into the waste water, which gives a saving in the load of the water treatment.

To eliminate the emission of vapour and smell which is generated by the specialty line, the frying vapour discharge of this line will be connected to the frying vapour condenser on one of the French fry lines. So this last source of vapour and smell can be handled.

The investments mentioned are all contributing to a reduction of the visible emission of steam and the invisible, but very noticeable emission of smell. Also less energy, water and frying oil is used in the production lines of Ecofrost and all recovered energy is used optimally.

