

High Quality EVOO in the mill



Stages of processing

- 1 . Cleaning, washing and drying of olives
2. Crushing/Depitting
3. Thermal conditioning of paste through the exchanger
4. Conventional and continuous malaxing
5. Ultrasound to facilitate oil extraction at experimental phase
6. Extraction
7. Separation
8. Filtration
9. Storage
10. Bottling

Cleaning Washing Drying operations



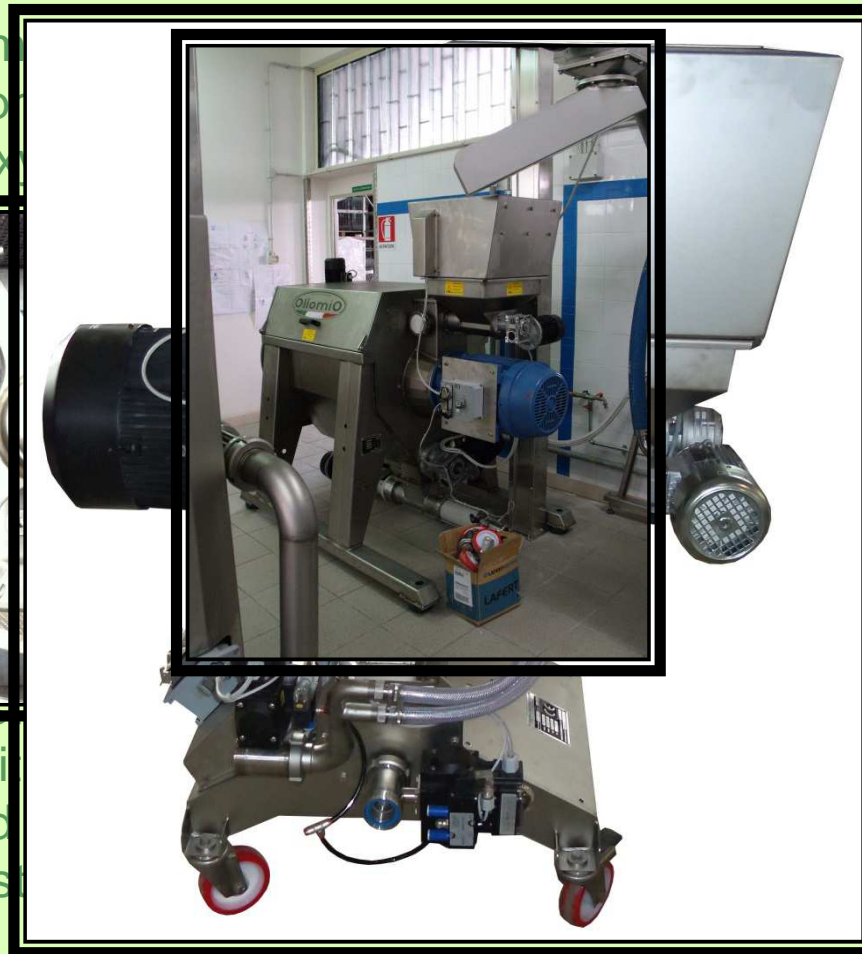
Nowadays the drying operations can grant excellent results.

Crushing / Depitting

Crushing is the first stage of the process, as it determines the particle size of the product, giving start to the lipooxygenation process.

The speed of the crushing process is determined by the type of product and the desired particle size.

Depitting stage, on the one hand it removes the seeds from the product, on the other hand it allows the insertion of new pastes, making the stages easier.



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Thermal conditioning of the paste through exchanger

The tube-in tube exchanger, popular in the wine and food sectors, finally comes to the oil sector, too. The results obtained until now are very positive. In order to reach the highest quality, it is important to control the thermal temperature.



The WARM/COLD generator allows to reach the programmed temperature from the crusher to the malaxer for warming up and cooling down stages. At the end of the processing stages, every single part of the exchanger must be easily reachable for perfect cleaning, it is the only way to make a high quality oil.

Continuous and conventional malaxing



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The «Sistema Lineare» allows a saving 30% of electricity.

Ultrasound to facilitate oil extraction

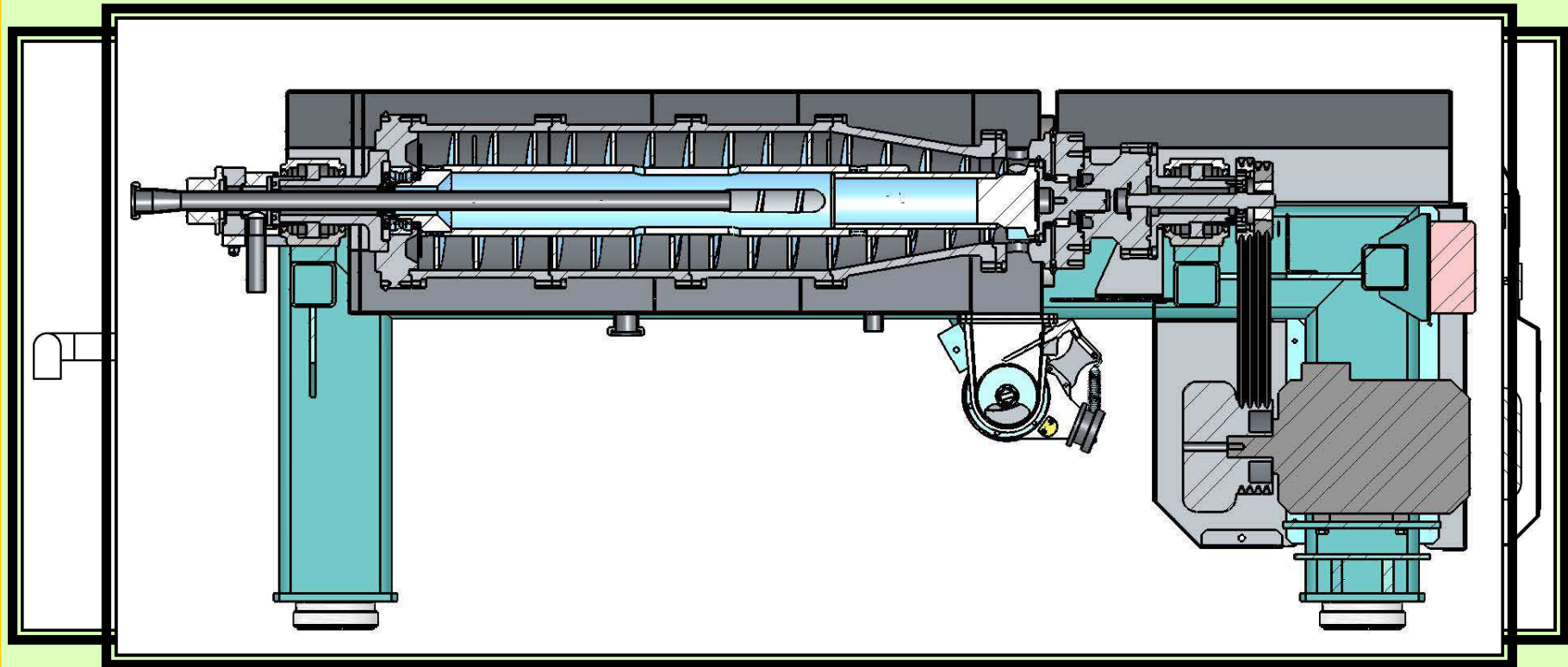
Before accessing to the decanter, where the oil extraction takes place, the paste goes through a tube provided with ultrasound transducers. The sound waves fragment the vacuole separating the water/oil cell.



This operation doesn't imply excessive temperature rise, as we could expect, even though new tests must be performed through repeated working sessions in the mill.

According to the tests carried out, this passage will at the same time increase the yield and keep the quality high. Some years more are needed to confirm it.

Extraction



The two-phases system allows the extraction of more phenols and aromas. Nowadays, new decanters have been designed and manufactured to avoid this problem. This system also reveals some problems like vegetable water logging at paste inlet in the decanter until the exit of the oil.

Separation

Separation, especially in the 3-phases extraction system, is crucial, even though it detracts from the product due to the oxidation that takes place.

It is good to remember that the separation doesn't replace the filtration, as the quantity of water left remains pretty high; without filtration this water can't be removed.



Filtration

This stage is now considered crucial: it is no longer a choice, but a necessity



In case the oil is extracted without passing through the separator, it is necessary to filter it immediately at the exit of the decanter. By passing through the separator it is possible to filter it some days later.

Finally, filtration is supposed to be done through a sole stage to avoid oxydation

Storage

It is recognised that oil must be stored in stainless steel tanks (which dimensions depend on one's production) with inert gas, in a $\pm 15^{\circ}\text{C}$ conditioned temperature environment.



Bottling

Bottling must be done just a few days before shipping.
The oil must go directly to the bottles without going through a pump,
to avoid excessive oxydation of the product.



Taking off the oxygen from the vacuum space in the bottle head is good
for the life span of the product,
as the space in the vacuum head is very high in relation to the volume.

Conclusions

In the crushing stage we create EVOO, whereas in the other stages we have just to preserve what we have created.

Filtration is crucial.

The raw material is fundamental to produce a great EVOO, but the instruments and human factor too are very important.

Many people think that the machines can stay dirty for 7-8 hours before beginning the next working session; we tell you that the machine must be cleaned all the time very carefully; as a matter of fact the problems one can detect in the obtained EVOO are coming from a bad hygiene.



Thank you!