

# The most crystal clear refined oil

## Wintrend® Technology



### Main features

- One single plant only for dewaxing & winterising
- Perfect cold stability : at least 72H at 0°C
- Two-step filter aid dosage : minimal consumption
- Gradual cooling : reduced filter aid consumption
- Fully closed process : no oil oxidation

### Process application

Winterising is an operation designed to preserve limpidity and refined oils brightness.

It consists in removing from these oils, mainly maize and sunflower, small quantities of solids that cause cloudiness when the oil is kept at low temperature.

### Waxes

These solid substances can be saturated glycerides or waxes. Waxes are esters of fatty alcohols and fatty acids, which have a very low solubility in oils.

Thanks to the relatively small amount of solids – between a few hundred and 2000 ppm – winterising is a continuous and, therefore, cost-effective process.

### Good stability

In order to obtain an oil with good stability, the wax content needs to be reduced to a level of less than 10 ppm.

To achieve this, the variables of time, temperature and agitation require special care to produce oil in a closely controlled range.

### Process fundamentals

The process is conducted in four steps:

- The oil is precooled in heat exchangers
- Filter aid is added just before the first crystalliser, and the oil is cooled very slowly, in a minimum of 6 hours, a prerequisite for gentle crystallisation;
- The crystallised oil stays 6 hours in the maturator, at final cooling temperature;
- The oil is then filtered in horizontal hermetic leaf filters, generally precoated with filter aid. The oil temperature is often raised just before filtration, to reduce viscosity and hence facilitate filtration.

Oils & Fats  
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## Process performance

The average market requirement is for an oil that remains clear for at least 72 hours at 0°C.

We must however keep in mind that there may be serious differences, as the requirements vary from area to area and are not the same for salad oil and mayonnaise.

## Solubility of waxes in sunflower oil

Temperature °C	0	10	15	20	30	40
Waxes ppm	0.1	1	3.5	13	113	960

## Effect of wax content on cold stability of sunflower oil

Wax content ppm	Cold test 5.5 hr 0°C	Storage time at 0°C (days)				
		1	2	3	4	8
6						
8						
10						
20						
30						
40						
50						
60						
70						
80						
100			>>> settling a bottom			
150						
200						

Clear oil	Visible turbidity	More pronounced turbidity
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## Process description

The incoming oil – generally bleached oil – is first cooled by heat exchange with cold winterised oil: a further heat exchange with cold water is sometimes required.

In some cases, the cooling procedure may be different.

The precooled oil is then mixed with filter aid, stored in a daily buffer bin that is equipped with a variable speed dosing screw. The filter aid promotes crystallisation.

The oil-filter aid mixture flows continuously through the oil coolers.

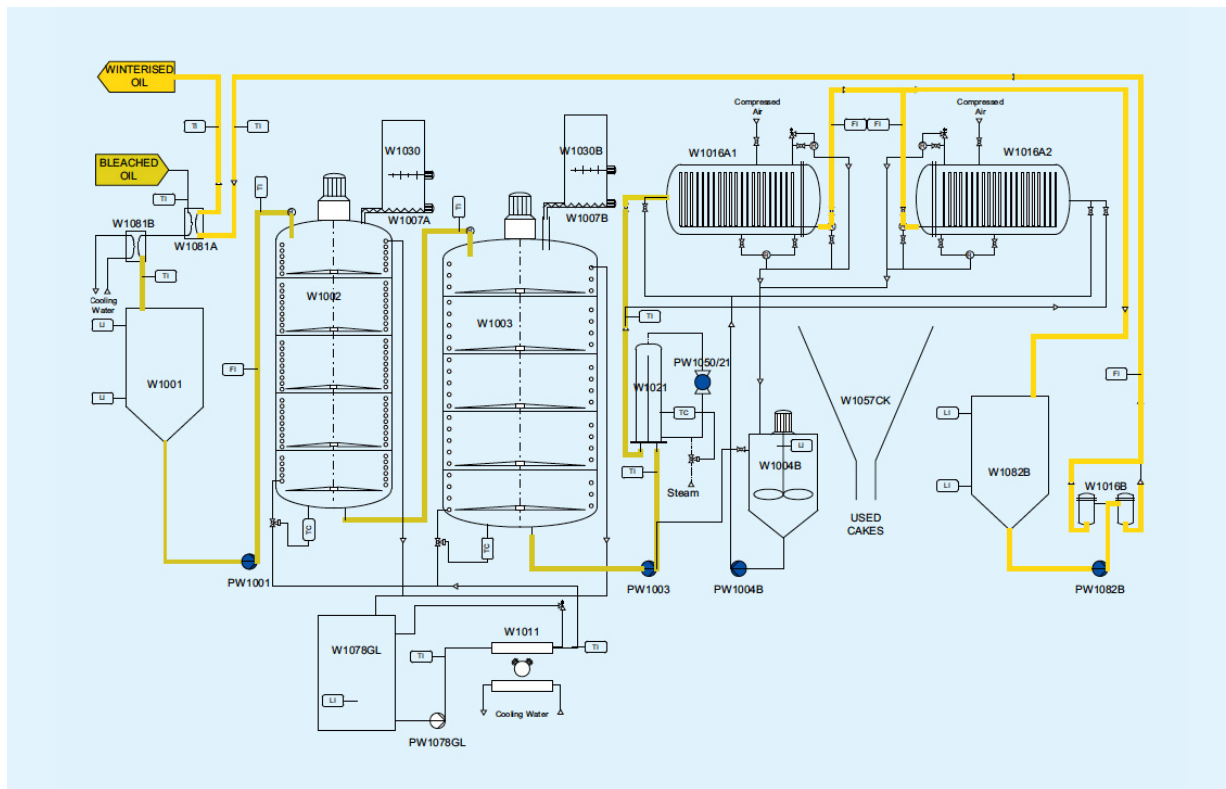
The mass of oil is gradually cooled by means of glycol water circulating inside cooling coils. One or several coolers are installed according to plant capacity. The oil overflows continuous from one to the next series.

From the last coolers, the oil overflows to one or more maturators, according to capacity. The oil is kept there for a certain time before filtration, to allow crystals to grow. Oil maturation is combined with cooling in small capacity plants.

Filter aid is sometimes added at maturation level, in order to improve the filtration rate in given cases, which reduces the overall filter aid consumption.

The oil is then filtered in a horizontal pressure leaf filter, with a retractable pack of stainless steel leaves. Before cooled oil filtration, the leaves are precoated with filter aid. The precoat is prepared in a heel tank, which is equipped with an agitator and a high flow precoat pump.

Once the filter is full, the cake is dried with compressed air. The retractable filter body or shell of the filter pack moves and the filter cake is discharged into a hopper by pneumatic vibration.



# Wintrend® Management

## Process Automation

### Easy management

Whatever the size of the plant, the various processes used in winterising are easy to manage today, thanks to the rational approach offered by computers and programmable logic controllers.

### Reduction of risks

Automation serves various purposes, among which we would like to mention the reduction of risks attributable to human mistakes, the obtention of a better and constant quality, superior yields, reduced consumptions and a higher degree of safety.

### Any framework of any network

The framework of automation networks – to which it is easy to add other digital systems – is so flexible that numerous solutions exist, for both new and old plants. These networks do meet the requirements of all the processes used today.

## Centralised Supervision

### Permanent follow up

Centralised supervision is the most efficient tool to permanently follow production.

### Overall view

The method, using selected softwares, continually offers an overall view of the ongoing activities and of their historical account.

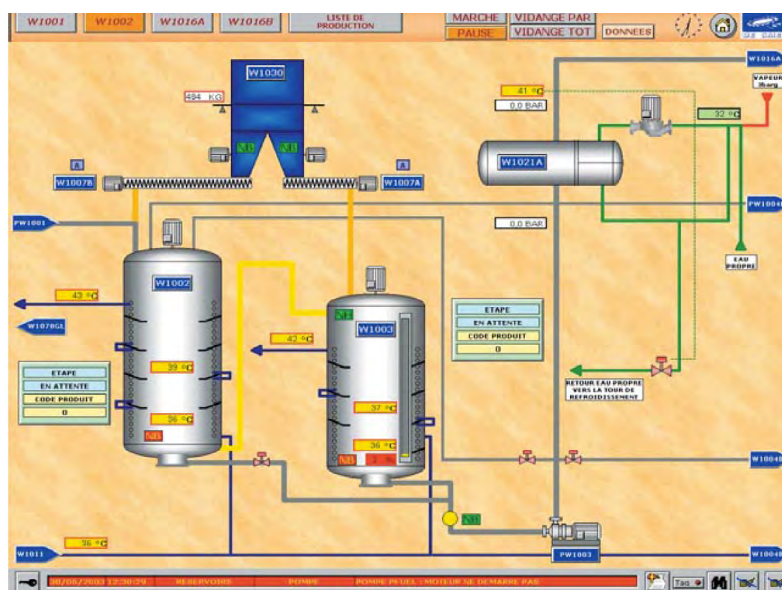
### Reports

- Analogic reports
- Reports on variables
- Preventive maintenance reports
- Production reports: flowrates, quality controls, etc

Easy to analyze, these reports are the undeniable witness of the complete activity of a process.

### No data unattended

Central supervision is the ultimate management tool that leaves no data unattended.



For more information on Wintrend® technology for your specific process, contact your local Desmet Ballestra office!