Filtration of edible oil/vegetable oils and fats

1. Introduction

Filtration is a key process step in the edible/vegetable oil industry. The presence of gums, slimes and gels requires experience in filtration. Knowledge in combination with creativity is the key to success in solving filtration problems. MAHLE has more than 50 years experience in filtration of edible oils. More than 5000 filters have been sold to the edible oil industry so far. The filtration steps in processing edible/vegetable oil and fats after mechanical and/or solvent extraction are listed below. On the next page a flow chart with all process steps and the filtration steps is shown. For all of these filtration steps MAHLE Industrial Filtration can offer you a solution. Application data sheets for the different edible oil processes as well as for the filters used are available.

The standard filters used are:
- Pressure leaf filter (Versis / RBDCD)
- Cricketfilter® / PTS filter
- Cricketfilter® / PTS filter for polish / heel filtration
- Bag filter
- Cartridge filter
On request a filter can be supplied with ATEX.
2. Equipment selection

Modern edible/vegetable oil refineries and processing plants are automated to a large extent and this requires reliable and easy-to-automate equipment. Operation should be simplified, operation faults avoided and above all, an exactly defined process should be achieved. The pre-treatment of the filter, filtration and cleaning of the filter takes place in a semi or fully automatic mode and no intensive labour is required to open and/or close a filter in order to discharge the filter cake and get the filter back into operational condition. The selection of the right filter type for each individual process step depends on a number of factors, such as:

- Space requirement and available space
- Type of cake discharge
- Filter unit size in combination with the plant capacity
- Batch or continuous system
- Investment costs
- Experience

3. Filtration steps

Depending on the type of oil and final purpose, the oil is processed in a sequence of process steps which can be divided as follows:

- Crude oil filtration for removal of foots.
- Miscella filtration for production of lecithin from gums.
- Bleached and/or detoxified oil filtration to remove colour and other components.
- Winterised oil filtration to remove waxes to enhance cold stability.
- Catalyst filtration to remove nickel catalyst after hydrogenation of the oil.
- Residual catalyst filtration to remove solid nickel catalyst after transition to nickel soaps.
- Deodorised oil filtration to remove impurities formed during deodorisation.
- Safety filtration to improve filtrate quality and/or to protect sequential equipment.
- Polishing filtration to improve product quality.

(M) = Main filtration, (H) = Heel filtration, (S)=Safety filtration, (P)= Polishing filtration

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