

SAI ChemPartners India Pvt Ltd



Filtration of wine

PROCESSES AND EQUIPMENT



TECHNOFILTER – FILTRATION TECHNOLOGIES

RESEARCH-AND-MANUFACTURING ENTERPRISE
TECHNOFILTER IS A LEADING RUSSIAN COMPANY
IN DEVELOPMENT AND PRODUCTION OF SYSTEMS
FOR INDUSTRIAL MICROFILTRATION USING DEPTH,
MEMBRANE AND SORPTIVE CARTRIDGE FILTER
ELEMENTS.

Technofilter has a 20-year experience in development and production of micro filtration membranes and pleated filter elements.

Technofilter offers an extensive range of filter elements on the basis of cellulose, glass fibre, Nylon, polyether sulfone, fluoroplastics, stainless steel and other certified materials.

The objective of the company in the field of food industry is development and production of filtration systems improving the quality of beverages and provision of technical and service assistance to the customers.

The equipment produced by Technofilter exhibits reliable performance in production of famous wines, distillery products, mineral waters, juices and non-alcoholic beverages.



Main applications of cartridge membrane filtration in wine-making

- Defertilizing filtration of wines in cold sterile bottling conditions
- Removal of residual opalescence in hot bottling conditions
- Fine filtration of flushing water and washing liquors
- Sterilizing filtration of air and carbon dioxide, «breathing» of tanks

Required conditions for faultless final membrane filtration

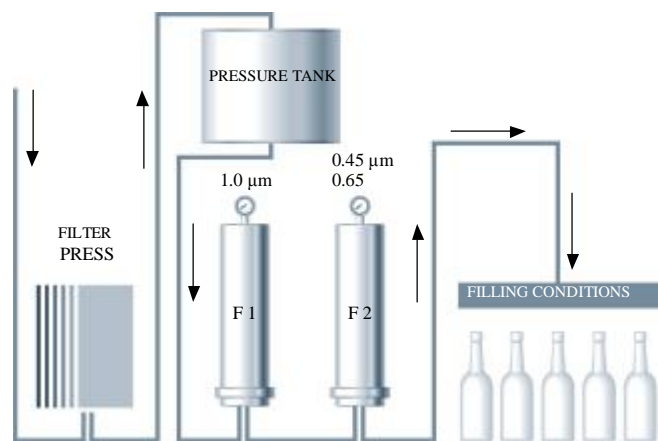
- Careful preliminary preparation of wine material
- Pre filtration of wine through a filter press incorporating a high-quality cardboard
- Availability of sterile service media
- Carefully prepared defertilized vessels provided with filters for sterile breathing
- Careful sterilization of equipment and all materials coming into contact with wine
- Good sanitary state of the manufacturing plant

Membrane filtration is the most common technique used for microbiological stabilization of beverages with no use of chemicals or heating. In contrast to pasteurization, cold stabilization preserves aroma, taste and the fine structure of wine.

EPM (ЭПМ) membrane filters ensure complete retention of wine-spoiling microorganisms.

EPV (ЭПВ) fine filters displaying a high dirt-holding capacity and a long service life ensure excellent protection of the membrane element and extension of its service life.

Lay-out of the filtration system



As a rule, only one stage of fine filtration is used in hot wine bottling conditions. For complete removal of opalescence, it is recommended to add a membrane filtration stage having retention ratings of 0.65 or 0.8 μm



EPM.PS (ЭПМ.ПС) new generation cartridge filter incorporating a polyethersulfone membrane

Techno filter presents EPM.PS (ЭПМ.ПС) new generation cartridge filter incorporating a polyethersulfone membrane, specially developed for defertilization of wine and beer that can withstand multiple washing, reconditioning and sterilization



Features

The filter incorporates a reliable pleated polyethersulfone membrane offering superior performance

High retention efficiency with respect to bacteria and microorganisms (99.98%)

Pronounced asymmetric pore structure and increased overall porosity of the membrane

Stronger structure, longer service life

100% control for guaranteed quality, integrity testing

Non-toxic, apyrogenic

Advantages for the user

- Broad chemical compatibility (pH 1 to 14)
- Excellent thermal stability (up to 100°C for water)
- Low binding capacity with respect to albumens and proteins
- Extended service life resulting from increased surface area (up to 0.75 m²/250 mm)

- Available with pore sizes 0.65, 0.45 and 0.2 μm. Guaranteed removal of yeast cells, mold fungi and bacteria before bottling

- High filtration rate and low differential pressures reduce financial costs

- Reliable preservation of filter integrity in severe operating conditions
- The possibility of multiple sterilization ensures cost-effective operation of the filter

- Microbiological safety – penetration of retained particles and microorganisms into the filtrate is ruled out
- Guaranteed integrity and effective operation of the filter
- The filters can be subjected to a special integrity test in the course of operation

- The filters have undergone extensive testing and have been certified for use in food industry. The filters are produced in accordance with a certified quality management system ISO 9001:2000

Performance characteristics

Maximum operating temperature	80°C at 0.20 MPa
Maximum differential pressure	0.5 MPa at 20°C 0.2 MPa at 80°C
Recommended flow rate/250 mm	250 to 300 l/hour
Flushing with hot water (no less than 50 cycles)	90°C, 30 min
Sterilization with steam (no less than 20 cycles)	121°C, 30 min



Effective prefiltration

Most bottling lines use two-stage filtration of wines before bottling.

The «prefilter- final filter» combination increases the reliability of the process, ensure maximum filtration rate, a long service life and cost-effectiveness of the filtration system.

To ensure high-quality prefiltration, Technofilter recommends pleated depth filter cartridges EPV.S (ЭПВ.С) and, EPVg.P (ЭПВг.П) that can be repeatedly reconditioned.

Recommended options for prefiltration before membrane filter elements

Final membrane filter	EPM.PS-045 (ЭПМ.ПС-045)	EPM.PS-065 (ЭПМ.ПС-065)
Ordinary protection (for easy-to- filter beverages)	EPVg.P-100 (ЭПВг.П-100)	EPVg.P-150 (ЭПВг.П-150)
Intensive protection (for cold sterile bottling)	EPVg.S-050 (ЭПВг.С-050) or EPVg.P-065 (ЭПВг.П-065)	EPV.S-090 (ЭПВ.С-090) or EPVg.P-100 (ЭПВг.П-100)

Brief specification of depth filter elements used at preliminary and final stages of filtration of wines

Grade	Filter medium	Retention efficiency, μm	Brief description
EPV.S (ЭПВ.С)	Glass microfibrres	0.5; 0.9	Stable rigid matrix, chemically stable in acid, alkaline and alcoholic liquids, absolute retention capacity, multiple reconditioning, increased dirt-holding capacity and service life. Operating temperature of up to 100°C. Can be used as a final filter in hot bottling conditions.
EPVg.P (ЭПВг.П)	100% chemically stable polypropylene	0.5; 0.65; 0.8; 1.0; 1.5; 2.0; 5.0; 10.0; 20.0	Stable rigid matrix, high retention efficiency, multiple reconditioning, operating temperature of up to 90°C. Can be used as an effective prefilter or as a final filter in hot bottling and in the pasteurization process



Component parts of filtration systems



Filter holders for liquid filters

Technofilter presents DS-5 and DS-8 (ДС-5 and ДС-8) filter holders (NEW series) made of 12Kh18N10T (12X18H10T) stainless steel.



Features

- High-quality finishing of inner and outer surfaces
- Easy access to internal cavities for visual inspection and washing
- No hidden or hard-to-reach cavities due to extra lightweight spacer
- No stagnant zones
- Complete evacuation of liquid through drain valve
- Increased accuracy and finishing of nests for adaptors and of surfaces for sealing parts ensure high impermeability of boundaries between the feed, the filtrate and the outer environment
- Simplified on-site assembly owing to hinged connection of pipe sockets to the base. The filter holder is provided with pressure gages for monitoring of flow resistance

Specifications

Grade	Number of elements x height, mm	Overall dimensions, mm	Max. operating temperature, °C	Max. operating pressure, MPa	Nominal bore, mm	Adaptor type, mm
DS-5-A-500P (ДС-5-A-500П)	5x500	557x290x1018	180	0.6	40	44.5
DS-5-A-750P (ДС-5-A-750П)	5x750	557x290x1268	180	0.6	40	44.5
DS-5-A-1000P (ДС-5-A-1000П)	5x1000	557x290x1518	180	0.6	40	44.5
DS-8-A-500P (ДС-8-A-500П)	8x500	746x395x1083	180	0.6	50	44.5
DS-8-A-750P (ДС-8-A-750П)	8x750	746x395x1333	180	0.6	50	44.5
DS-8-A-1000P (ДС-8-A-1000П)	8x1000	746x395x1583	180	0.6	50	44.5



Filtration systems

On customer's request, Technolter produces manually or automatically controlled systems UPF.R or UPF.A (УПФ.Р or УПФ.А) on the basis of NEW series multicartridge filter holders, designed for various flow rates (0.5 to 16.0 m³/hour or more). Technofilter designs, fabricates and assembles the systems in accordance with individual requirements of the customer.

The systems are compact, mobile and easy to operate. They can be installed permanently on a specific position, on a frame or on a mobile carriage. The systems consist of several filtration units, are completely assembled (pumping unit, measuring equipment, control valves, piping, etc) and are ready for operation.

«Absolute-quality» automatically controlled systems

«Absolute-quality» automatically controlled systems (UPF.A/УПФ.А) intended for final filtration before bottling are popular with customers at distillery and wine-making plants.

The standard system is based on a 2-stage filtration concept. The systems can be additionally provided with a filter unit for preparation of service media. The systems vary in the set of components (selected options) and the degree of automation. Everything depends on the beverage to be filtered and individual requirements of the customer.



Advantages

- Steadily high quality of beverages
- Smooth start-up, maintenance of prescribed pressures at the input and output of the system
- No hydraulic blows
- Optimum set of options, compact size
- Full exhaustion of service life of filter elements
- Touchpad for real-time control of all filtration parameters
- Cleaning of filter elements with high-purity water or reconditioning with washing solutions directly inside the system without using any extra pump
- Removal of residual product with sterile compressed air
- Reliable component parts

«ABSOLUTE-QUALITY» SYSTEMS MAKE THE PROCESS OF FILTRATION EXTREMELY GRAPHIC, RELIABLE AND COST-EFFICIENT FOR THE CUSTOMER. THE USER CAN HAVE COMPLETE CONTROL OVER THE PROCESS OF FILTRATION AND FEEL ASSURED OF THE FINAL PRODUCT QUALITY.



Main applications of Technofilter's products and technologies in the beverage industry



Vodka and alcoholic beverages

- Regulated patented technique for producing vodkas using no carbon columns – «Silver filtration» – EPSF.UAg0.4
- New regulated filtration technologies for the improvement of organoleptic properties of vodkas:
 - «Platinum filtration» – EPSF.UPT;
 - «Golden filtration» – EPV.PAu (Golden Silk).
- Polishing filtration of vodkas before automatic bottling machine using «Absolute – quality» series automatic systems.
- Stabilization of coloured alcoholic beverages using cartridge membrane filtration.
- Filtration of wine blends.
- Filtration of ingredients (of alcoholic tinctures, fruit drinks, aromatic alcohols, sugar syrup, colour, etc)
- Cleaning alcohol from mechanical impurities in the course of reception from transportation tanks or alcohol storages.
- Improvement of organoleptic properties
- Refiltration of process waste.
- Improvement of organoleptic properties of drinks using a unique product, the natural modifier “Rose Petals”.

Cognac, Whisky

- Polishing filtration before bottling.
- Removal of excessive amounts of metals for the purpose of stabilizing the beverage.
- Improvement of organoleptic properties of the beverage.

Wine

- Polishing of wines in the course of preparation for bottling.
- Microbiological stabilization (defertilization) of still wines before bottling (cold bottling).
- Prefiltration.
- Removal of excessive amounts of metals for the purpose of stabilizing the wine.
- Preparation of service media.

Low-alcohol and soft drinks

- Filtration of blends.
- Filtration of sugar syrup.
- Filtration of carbonic acid.
- Filtration of water for preparation of the drink.

Beer, non-alcoholic beverages

- Prefiltration.
- Trap filtration (fine filtration after a precoat diatomaceous earth filter).
- Defertilization (sterilization) (for cold sterile bottling) by membrane cartridge filtration.
- Sterilizing filtration of process air, carbonic acid, nitrogen.
- Water treatment (sterilizing filtration, prefiltration).

Mineral and bottled waters

- Sterilizing (microbiological) filtration of «still» water before bottling.
- Fine filtration of aerated waters before bottling.
- Prefiltration.
- Coarse filtration (removal of particles).
- Sterilizing filtration of carbonic acid.

Juices, fruit drinks, syrups, liqueurs

- Pre filtration.
- Fine filtration before hot bottling.
- Cold sterilization.

Service media

- Air:
 - Removal of oils and moisture;
 - Removal of particles;
 - Sterile filtration of carbonic acid;
 - Deodorization;
 - «Tank breathing».
- Water:
 - Disinfection of filters and equipment;
 - Preparation of water for product formulation;
 - Aseptic treatment.
- Vapour:
 - Fine cleaning;
 - Preparation of sterile vapour.

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