Filter Elements
worldwide successful in operation

Membrane Plates
Chamber Plates
Special Filter Plates
Accessories
for Solid-Liquid-Separation

Filtration Systems
JVK FILTER ELEMENTS

JVK filter elements and especially JVK Membrane Plates have been established in many industrial filtration applications since 1962.

JVK has contributed significantly to many developments in the field of solid-liquid separation with new ideas and designs.

JVK is producing one piece moulded plates for filtration equipment in accordance with DIN standards or as special designs in polypropylene or other thermoplastic materials with the most modern ICM technology.

JVK offers long-term experience on development, production and application of membrane plates. In 1964 already, the first trials had been completed in a chemical plant with membrane plates.

JVK commenced the dedicated production of membrane plates equipped with elastomeric membranes in 1968.

JVK membrane plates are successfully used worldwide due to the design, the high quality standard and the continuous product development.

APPLICATION OF MEMBRANE PLATES

WASTE WATER / SEWAGE TREATMENT PLANTS

Waste water treatment and water purification for potable water, dewatering and decontamination of industrial and municipal waste water:

- Waste liquors from dust scrubbers
- Paper, leather and latex waste water
- Waste cuttings of wood and stone
- Coal and ore suspensions from flotation processes
- Neutralization plants, oil refineries
- Metal hydroxide sludges (galvanic)
- Drilling mud of oil rigs

CHEMICALS

Manufacturing of mineral pigments, titanium dioxide and organic dyestuffs, filtration of phosphoric compounds and ferments for the production of wetting, washing and cleansing agents, chemical intermediate products and fillers e.g.

- Kaolin, aluminum oxide, activated clay etc.
- Chlorine electrolysis, filtration of brine to produce chlorine, sodium hydroxide, zeolite, silica etc.

PHARMACEUTICALS

Extraction and washing of intermediate products with sterilisation at temperatures up to 100 °C

- Filtration of blood plasma, syrup etc.

BIOTECHNOLOGY

Filtration of blood plasma and other substances, which must be protected from contact with bacteria.

FOOD

Production of soup, soup seasonings, rice noodles, sugar, vegetable oil, palm oil, fruit juice, wine, yeast, starch, gelatine, beer, agar-agar etc.

CERAMICS

Dewatering of caolin, chalk, clay, porcelain and ceramic bulks

METALLURGY

Filtration of metallic salt solutions serving as first step of electrolysis when refining nickel, copper, silver, gold and uranium and by-products as molybdenum

- Electrolytic separating of metals reprocessing of batteries

PAPER INDUSTRY

Recovery of water and fibres etc.

SYNTHETIC FIBRES

Spinning fibres, gel filtration of viscose

The use of the operating manual guarantees the safe operation with JVK membrane plates.
TECHNICAL ADVANTAGES OF MEMBRANE PLATES

1. SHORT FILTRATION CYCLE
A low cake moisture content by pressure filtration can only be achieved with recessed plates by high filtration pressure and long filtration time (B).
The membrane system requires much lower filtration pressure to fill the chambers (A).
The cake moisture content is caused by squeezing with a flexible membrane (C).
The production cycle is determined by:
- fast feed of chambers at low filtration pressure
- cake squeezing in a few minutes with pressures up to 5 N/mm²

2. LOW RESIDUAL MOISTURE
application of squeezing pressure to filter cake by elastic membranes replaces the high pressure filtration phase of conventional recessed plates.
- remarkable reduction of residual cake moisture in shorter time
- reduction of total filtration cycle time
- increased filtrate output
- very short discharge time
- increase in solid content up to ca. 100 % with special vacuum process
- less cake adhesion on the filter cloth
- automatisation of filtration process
- lower costs for pumps
- savings in energy
- less transport and dumping costs due to compact and very dry filter cakes

3. SHORT WASHING CYCLE
JVK membrane technology creates homogeneous cake without cracks by applying a low membrane squeeze pressure during cake washing

• uniform and adjustable capillary structure
• optimal cake washing efficiency during the shortened washing time
• reduced washing liquor consumption

4. EXCHANGEABLE MEMBRANE
The Membrane is easily exchangeable
- not necessary to exchange the complete filter plate
- only replacement of membrane necessary
- Membrane materials can be adapted to suit operating conditions

5. WELDED MEMBRANES
For special applications membrane may also be supplied totally sealed and welded into the plate

6. LOAD ON MEMBRANE
No direct press closing force is applied to the membrane surface:
- The membrane does not cover the sealing rim of the plate and the support bosses of the plate in case of the exchangeable membranes
- no need for additional filter press closing force control in most applications

7. HIGH ELASTICITY OF MEMBRANE
The elastic membrane adjusts itself to the shape of the cake without permanent deformation caused by uneven cake surface or different cake densities:
- homogeneous cakes of equal density for effective washing and cake airdrying
- extension of the membrane into empty chamber without any problems

8. SEALING OF FILTER PLATE SYSTEM
The plan-parallel machining of membrane plates according to DIN 7129 achieves a perfect sealing surface. For applications where a liquid-tight seal is required, a complete gasketed plate (CGR) is also available.

9. INCREASED FILTRATE OUTLET CROSS SECTIONAL AREA
The diameter and quantity of filtrate outlet ports can be adapted to process requirements
- large filtrate volumes can easily be drained off
- no blockages, often due to solids and/or crystallisation
- no restrictions at clogging outlets due to filter cloth obstruction

10. FIELDS OF APPLICATION
The materials used by JVK, allow installations in almost every field of application and can be adapted to any working conditions:
- temperatures -20 up to 140 °C
- filtration pressure up to 1,5 MPa (15 bar)
- squeezing pressure up to 6,0 MPa (60 bar)
- adaption to resist chemical conditions

11. SAFETY OF EXCHANGEABLE MEMBRANE SYSTEM
The exchangeable JVK membrane is not bolted or welded as a rigid connection into the sealing area:
- the pressure of the squeezing fluid can only be maintained under full closing pressure of the filter press
- the membrane is immediately released from groove, if the closing pressure is lower than the squeezing pressure
- pressure release without destroying the membrane
- reduction of safety feature requirements
DESIGN OF THE MEMBRANE PLATES

The design covers all relevant technical requirements
• designed to operating conditions
• simple construction
• outstanding functional safety
• trouble free maintenance

1. BASIC CONSTRUCTION
• standard and special designs
• feed and corner ports internal or external of filter plates in different positions

2. MEMBRANE CORE PLATE
• one piece moulded with JVK ICM technology
• ultra high molecular high heat stabilized polypropylene (PP)
• machined according DIN 7129
• wide range of materials available

3. MEMBRANE
• vulcanised or thermoplastic elastomers as well as thermoplastic like EPDM, NBR, SBR, PP-TPV, PPC, PPR, FKM (VITON) etc.

4. EXCHANGEABLE MEMBRANE
• the membrane is detachable installed in the sealing rim, support boss and feed hole
• no metal parts inside the filter chamber

5. SQUEEZING MEDIA
• air or liquid
• location of the plate connections can be adapted to suit the filter press and installation requirements
• internal or external plate connections

6. FILTERCLOTH
• simple installation of filter cloth without screws
• barrel neck design
• drape over also with grip ring or support and distribution ring
• gastight design

The combination of JVK membrane- and combination plates is a proven design. The advantages are significant: Reduced installation costs and no restrictions as associated with non-elastic type membranes.

The use of support and distribution rings secures the even filling of chambers. Differential pressures and plate bending are reduced.
OPERATION OF THE MEMBRANE PLATES

1. FEEDING OF FILTER PRESS
During the feed step (1) the elastic membrane (2) moves back towards the core plate (3) under low tension. Press feeding finishes when the optimal operating point is achieved. Filtration finishes prematurely at a lower pressure and less time compared to chamber plates.

2. WASHING THROUGH FEED PORT (GAP-WASHING)
After finishing the filtration the cakes may be washed through the feed port. For efficient washing no squeezing pressure and no chamber overfilling allowed (4). Cake washing fluid is forced through the pasty cake center and exits on both sides of the cake.

3. PRE-SQUEEZING AND WASHING THROUGH CORNER PORTS
The filtercake is consolidated in the chamber by applying low membrane pressure to avoid gaps or cracks. Following washing versions can be used:
- washing in one direction right to left
- washing in diagonal directions
- washing top to bottom or
- bottom to top (flooded)
- washing fluid is forced to penetrate the cake from the membrane chamber plate to the combination chamber plate.

4. SQUEEZING OF FILTER CAKE
According to the cake structure the membrane pressure can reduce the residual moisture content in the filter cake significantly. The squeezing pressure is normally higher than the filtration or the pre-squeezing pressure. After squeezing the cake thickness should be smaller than the chamber depth. Otherwise overfilling of the chambers could have occurred or the cake is incompressible.

5. FILTER CAKE BLOWING
Filter cake blow is performed using the corner ports. Non compressible filter cakes can be dried further with the assistance of squeezing pressure.
STANDARD MEMBRANE- AND COMBINATION PLATES

APPLICATION IN ALL INDUSTRIES

Sizes and Designs from 150 x 150 mm to 2000 x 2000 mm and 2500 x 3000 mm as a special design available.

2000 x 1500 mm center feed

1200 x 1200 mm top center feed

1500 x 1500 mm center feed
SPECIAL DESIGNS OF MEMBRANE- AND COMBINATION PLATES

Membrane- and combination plate 1200 x 1200 mm corner feed

Filter press with membrane- and combination plates 1200 x 1200 mm

Membrane plates for Tower Filter Press

PATENT No. DE 19905674

Tower Filter Press

Membrane plates for Tower Filter Press

CGR gasketed design (gas and liquid-tight) membrane- and combination plates are available in all sizes.

2320 x 4430 mm
SPECIAL DESIGNS OF MEMBRANE- AND COMBINATION PLATES

APPLICATION IN SPECIAL INDUSTRIES

Membrane plate in combination with filter plate and frame for blood plasma filtration 815 x 815 mm.


Aluminum chamber plate 1200 x 1200 mm in combination with FKM (VITON) membranes

Filter press with membrane- and combination plates 1200 x 1200 mm. Filtration of metal pigments with solvents, 16 bar squeezing pressure

Membrane- and combination plate 1200 x 1200 mm. PVDF plate and EPDM membrane are electric dischargeable or conductive. Application at extremely high temperatures and/or with aggressive chemicals.

Filter press with PVDF membrane- and combination plates 1200 x 1200 mm, application metallurgy, chemistry etc.
SPECIAL DESIGNS OF MEMBRANE- AND COMBINATION PLATES

APPLICATION IN SPECIAL INDUSTRIES

Membrane plate 1500 x 1500 mm for LASTA filter presses (Ishigaki). Application mining industry, metallurgy etc.

Combination plate 1500 x 1500 mm for LASTA filter presses

Membrane- and combination plate 1500 x 1500 mm for SALA filter presses. Application mining, chemical industry, metallurgy, etc.

Filter press with membrane- and combination plates 1500 x 1500 mm

Membrane plate 2000 x 2000 mm for filtration of flotation suspensions in mining industry, metallurgy etc.

Filter press with membrane- and combination plates 1500 x 1500 mm
MEMBRANE- AND COMBINATION PLATES

Membrane plate with exchangeable membrane and 2 external feed ports  2000 x 2000 mm

Membrane plate with welded membrane 1200 x 1200 mm

Membrane and combination plate with integrated cloth attachment (CGR), 800 x 800 mm [PATENT PCT 2004/043569]

Membrane plate 2540 x 2940 mm

3980 x 2940 mm

Membrane plate 2540 x 2940 mm
Filter press for cake drying with membrane plates 1200 x 1200 mm

The JVK TCM- TCC-System offers all process relevant steps: filtrate discharge, cake washing, cake blowing etc.

- no additional investment for dryers
- retrofitting of existing filter presses to cake drying system easily possible
- the operation of mixed plate packages as a combination of TCM- und TCC-Plates is possible
- instead of special plate designs standard membrane plates may be used
- no loss of cake volume by additional heating plates
- filtration of different slurry quantities with constant product quality
- guarantees low heat loss and therefore also low energy costs using a plate design of Polypropylene or Polyvinylidene Fluoride
- in respect to dust explosions, the drying in the closed filter press is without any risk
- protection against abrasion or corrosion is not required
- reduction of dumping costs due to maximum decrease in weight and volume of cake
- allows the use of process water with 60-70°C heating temperature only
- enables significantly reduced cycle time, because of a fast heat transfer in the cake via the metal drainage area

Filter press with high performance membrane plates 1500 x 1500 mm, up to 5.0 MPa (50 bar)

- cake compression up to bis 5 MPa
- the chamber is filled by the feed chamber plate (FCP) only
- the cake is squeezed by the compression chamber plate (CCP)
- the filter cloth is clamped leakage-free by a feed nozzle
- extremely high dry solid content in the cake
- no perforations in the membrane
- no blockage of conical feed port by optimal cake discharge
- full automatic filtration cycle
- various feed inlets in each chamber possible
- long life time of the membrane
- simple installation
- safe sealing
- low cost drape over cloth may be used
CHAMBER PLATES FOR FILTER PRESSES

- Chamber plate 630 x 630 mm
- 1500 x 1500 mm
- Chamber plate from aluminum for special applications 1000 x 1000 mm
- 2140 x 2150 mm
- Ø 800 mm
- 1500 x 2000 mm

- Long operating life
- Superior product quality
- Fast filtration
- Minimal cloth damage
- Excellent sealing
- Good heat insulation
- Easy cleaning
- Low weight

Filter presses with chamber plates 1067 x 1067 mm
FILTER ELEMENTS FOR PRESSURE VESSEL- AND VACUUM FILTERS

Filter Element for Niagara Filter in various sizes

Filter Element for Disc Filter in various sizes

Filter Element for Sweetland Filter in various sizes

Filter Elements for Auto Filter in various sizes

Filter Elements for Moore Filter in various sizes

Filter Elements for Kelly Filter in various sizes

RELY ON JVK – THE EXPERTS IN FILTRATION
Our experts and service team will support you at introduction and installation of the JVK Membrane Plates:

- Development for special application
- Calculation
- Efficiency tests on JVK or customer site possible, also with JVK trial filter presses
- Process optimization
- Commissioning

SPECIAL DESIGNS

- Special sizes and designs up to ca. **3500 x 2700 mm** are possible at this stage and can be developed and manufactured according to customers requirements.
- For the waste water filtration with polymer conditioning plates with extremely big filtrate outlets are available.
- For temperatures higher than **110°C** and for the filtration of organic solvents we recommend PVDF or Aluminum instead of Polypropylen for the plate material.
1962 J. J. VOWINCKEL GMBH was the first company to start the production of polyolefine filter elements in the filtration field of application. Even today filter plates manufactured at that time are still in operation.

1982 JVK took over production equipment and know-how for manufacturing of filter elements from Joh. Jac. Vowinckel GmbH.

1989 JVK acquired competitor HANSEN BTR. Membrane plates with exchangeable rubber membranes completed the JVK product line.

In 1992 JVK expanded the production capacity by taking over the production facilities for filter plates from a filter press manufacturer.

JVK is one of the leading manufacturers of innovative filter elements made from thermoplastic and other materials, which are successfully used worldwide.

JVK offers since almost 50 years high technical standard and know-how, long experience in the field of the solid-liquid separation, as well as engineering and processing for the manufacture filter elements.

The designs of JVK products are worldwide protected by patents and trademark rights.

Certificate according to DIN EN ISO 9001:2008
TÜV Rheinland Group
Certificate Registration No. 01 100 041 208

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Design Department working with the newest 3D CAD Systems.

Workshops are well equipped for mould construction, electronic installations, maintenance, machine and tool repair.

Applied Engineering and Research Department for the continuous development of existing and new JVK products as well as optimization of filtration processes.

Process-Engineering Department improves and introduces new manufacturing methods.

Laboratory and Quality Control for development, testing and controlling to guarantee and ensure the high quality of JVK products.

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CNC milling machine for special sizes 3000 x 5000 mm

CNC-Machining
Dispatch
Company

Presses for the production of filter plates up to sizes of 3500 x 2700 mm and to a thickness of 200 mm, according to the JVK ICM-process, with the following advantages:

• homogeneous material, one piece moulded without welded joints and inlay parts
• minimal thermal load during production
• extremely even distribution of micro crystallites
• low internal tensions

CNC – Milling Machinery for highest precision in the mechanical handling of large and small series of plates up to 3000 mm x 5000 mm.

• excellent mechanical characteristics
• high chemical resistance
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