PERMIONICS®
Customized membrane solutions

CELEBRATING 46 YEARS OF EXCELLENCE

Customised Process Membrane Solutions across the Filtration Spectrum

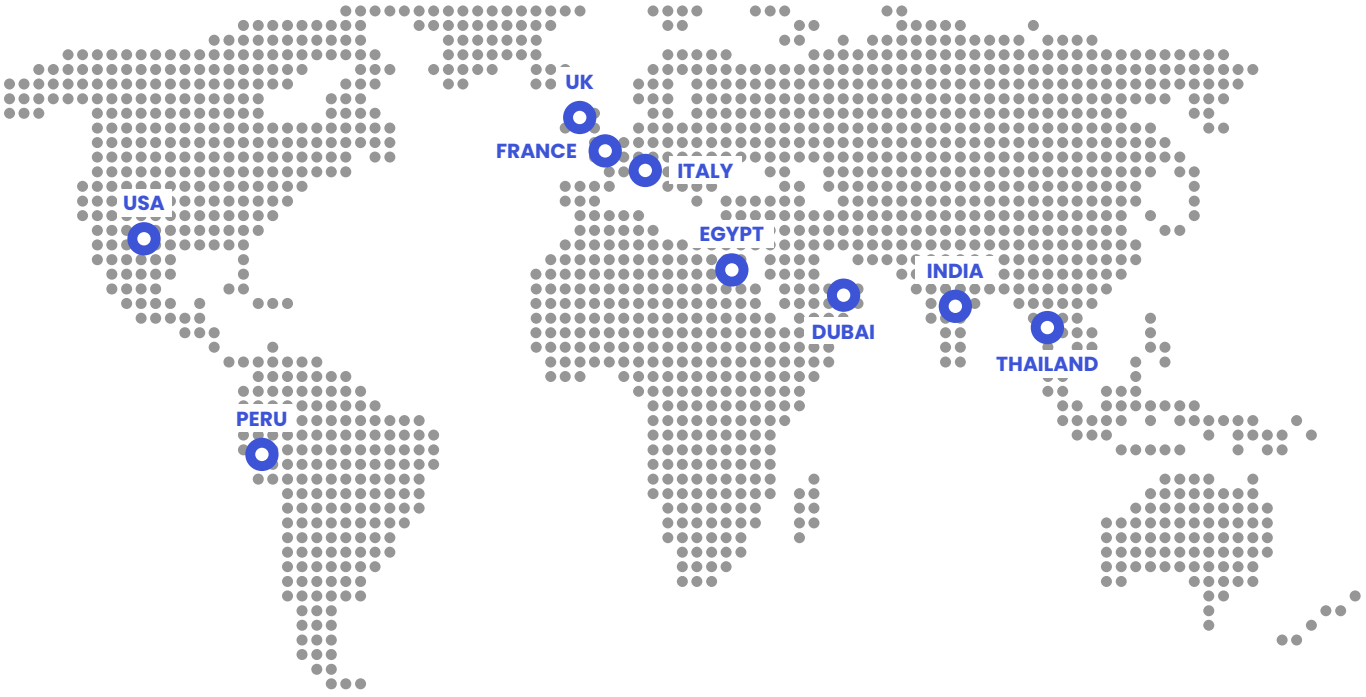
Legacy . Expertise . Reliability . Innovation . Quality

ABOUT
PERMIONICS

With a deep, 50+ year heritage as an Indian, liquid-liquid separation company, Permionics offers indigenously developed, custom membrane solutions for industrial use. Pioneering technological advancements in the space for decades, we are today a key global player providing end-to-end total industrial water management solutions, with a promise of high-quality and a customer-centric approach.

Our specialized membranes and membrane-based solutions form key components of world-class industrial equipment, with extensive application in industries such as pharmaceutical, herbal-based nutraceuticals, bioprocessing, fisheries, soy production, food & beverage, oil & gas, textiles, semiconductors, solar energy, sugar processing, inks dyes & pigments production, etc.

Working with an agile, design-thinking mindset, our specialists collaborate with customer teams to solve problems through technological innovation. We believe in moving fast, and delivering value while keeping costs efficient and product quality top-notch. This agile approach helps customer businesses get a competitive edge, and stay ahead of the curve.



By offering sustainable, cost-effective solutions for a wide range of industrial applications - we play a crucial part in reducing their carbon footprint and taking an environmentally responsible approach to business.

We take immense pride in the fact that all our membranes are designed and developed in India, by Indian engineers and innovators, reflecting our commitment to contributing to the country's economic growth and self-sufficiency. Our operations are rooted in the rich diversity and innovation that our country has to offer.

By manufacturing our products locally, we not only create job opportunities but also support the skill development and prosperity of the communities around us.

"From Sheet casting to rolling, all our membranes are proudly manufactured in India at our state of the art facility in Vadodara, India."

PROCESS MEMBRANES

FLAT SHEET MEMBRANES

We offer the MF/UF/NF/RO membranes with various molecular weight cut-offs (MWCO) and different polymer chemistries.

MEMBRANE MATERIALS

- *Polyvinylidene fluoride (PVDF)*
- *Modified Polyether sulfone (PES)*
- *Unmodified Polyether Sulfone (PES)*
- *Polysulfone (PS)*
- *Polyamide (PA)*

BENEFITS

- *High thermal and chemical resistance*
- *Precise MWCO*
- *High flux capacity*
- *Fouling resistance*
- *Acid and caustic resistance*
- *High temperature resistance*

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MF Membrane

MF Membrane	Membrane Material	Pore Size (µm)	Typical Applications
MFV010	PVDF	0.1	Fermentation broth clarification after centrifuge, beverage clarification, enzyme & protein clarification
MFV020	PVDF	0.2	
MFV045	PVDF	0.45	

UF Membrane

UF Membrane	Membrane Material	MWCO (Dalton)	Typical Applications
GRUF 05	PES	5000	Protein & enzyme concentration, WPC/WPI production, Gelatin concentration, Beverage clarification, Purification of product, Peptide concentration & purification, Size-based product fractionation, Pre-treatment of RO/NF, Wastewater treatment, Endotoxin removal, API concentration & purification, High molecular weight dye desalting & concentration
GRUF 10	PES	10,000	
UFP 30	PES	30,000	
UFP 50	PES	50,000	
UFV 100	PVDF	100,000	
UFV 500	PVDF	500,000	

NF Membrane

We by far have the widest range of NF membranes available in the market today, divided into three categories:
HFN series: The Non polyamide PES chemistry membranes
HFN AR series: The Non polyamide PES chemistry membranes stable in Acid and Alkali
HFT series: These are sharp cut off Polyamide NF membranes.

UF Membrane	Membrane Material	MWCO (Dalton)	Typical Applications
HFT 100	PA	100	API concentration & purification, Product concentration from pharmaceuticals, Herbal & bio-based stream, Dye concentration, Whey deashing, Milk concentration, Whey concentration, Peptide concentration & deashing, Bioactive molecule purification & concentration, Brine purification, High sulfate removal
HFT 150	PA	150	
HFT 200	PA	150-200	
HFT 250	PA	250	
HFT 300	PA	300	

UF Membrane	Membrane Material	MWCO (Dalton)	Typical Applications
HFN 300	PES	300-400	Brine recovery by decolourization of spent brine, Whey concentration & deashing, API concentration, Product purification, Peptide deashing & Concentration, Acid & Alkali recovery from metal finishing process
HFT 400	PA	400	
HFN 500	PES	500 -600	
HFT 600	PA	600	Dye, API, Polysaccharides, peptides purification and its concentration
HFT 800	PA	800	
HFT 1000	PA	1000	API, Peptides purification and concentration
HFN 1000	PES	1000-1200	API, Peptides purification and concentration
HFN 2000	PES	2000-2500	OBA purification and its concentration
HFT 3000	PA	3000	Protein fractionation, herbal extracts decolourization
HFN 3000	PES	3000	Protein fractionation, herbal extracts decolourization

Acid/Alkali Resistant NF Membrane	Membrane Material	MWCO (Dalton)	Typical Applications
HFN 300 AR	PES	300-400	Alkaline spent brine purification, Caustic recovery in textiles
HFN 500 AR	PES	500-600	

Sanitary Type for Pharmaceutical, Biotech and Food Process Glass-fiber Type for General Industrial Applications

We manufacture spiral-wound membranes with a wide variety of materials and MWCO. All our membranes have a compact design and an optimum ratio of the surface area to volume. The height of the feed channel can be varied by the thickness of the feed-spacer material (28 to 120 mil). This helps adapt the viscosity or the solid content of the liquid. The design features provide excellent hydrodynamics in combination with low energy demand. Membrane modules for speciality applications for acidic/caustic solvent resistance or high temperature are available.

Configuration	Outer Wrap	Membrane Type	Membrane Material	Size	Feed Spacer
SPIRAL	Sanitary Net Outer wrap	MF/UF/NF/RO	As per membrane selection	1521 1.5"x 21" 2540 2.5" x 40" 3838 3.8"x 38" 4040 4.0" x 40" 8038 8.0" x 38" 8040 8.0" x 40"	A = 28 mil B = 31 mil C = 46 mil D = 65 mil E = 80 mil F = 120 mil
	Glass Fibre				

MF MEMBRANES

MF membrane usually serves as a pre-treatment for other separation processes such as UF and NF. Typical particle size used in MF membranes ranges from 0.1 to 0.45 µm.

These membranes can prevent particles such as suspended solids, bacteria and macromolecular colloids–while allowing clarified feed with dissolved solutes, inorganic salts and other macromolecules.

MF membranes operate at relatively low pressure than UF - between 0.3 to 7 bar.

Applications

- *Clarification of fermentation broth in pharmaceutical and biotechnology industry.*
- *Removal of fine colloids and suspended solids.*

Advantages

- *High thermal and chemical resistance*
- *High quality raw material in module making*
- *Sanitary design without dead space*
- *High resistance to fouling*
- *Simple and economic module replacement*
- *High packing density*
- *Various choices of module dimensions*

SPIRAL UF MEMBRANES

UF membranes are characterized by their molecular weight cut-off (MWCO) between 1,000 – 200,000 Dalton, while higher cut-offs spill into the MF range.

Cross flow ultrafiltration is a pressure–driven membrane process capable of separating solution components on the basis of their molecular size and shape. Under an applied pressure difference across the ultrafiltration membrane - solvent and small solute species pass through the membrane and are collected as a permeate, while the larger solute species are retained by the membrane and recovered as a concentrated retentate.

Applications

- *Clarification of fermentation broth in pharmaceutical and biotechnology industry.*
- *Concentration of skimmed milk protein, whey protein, gelatin and other natural extracts protein and pectins*
- *Clarification of juices and wine*
- *Size-based product fractionation*
- *Endotoxins removal from API/ injectables*
- *Products purification, decolour-ization and concentrations*
- *Pre-treatment of industrial water*

Advantages

- *High thermal and chemical resistance*
- *High quality raw material in module making*
- *Sanitary design without dead space*
- *High resistance to fouling*
- *Simple and economic module replacement*
- *High packing density*
- *Various choices of module dimensions*

SPIRAL NF MEMBRANES

Cross flow nanofiltration is a pressure–driven membrane process capable of separating divalent from monovalent anionic salts such as sodium sulphate, sodium chloride etc. Therefore uses involve groundwater softening, de-salting of organic process streams (to separate dissolved salts from an organic solute) – when the organic solute has a molecular weight between 150 to 1000 (mainly the MWCO range in which NF membranes are available).

NF membranes are also widely used in food-processing applications such as dairy - for simultaneous concentration and partial demineralization of whey/ milk. NF membranes operate between 5 to 40 bar pressure. Elements up to 60 bar can also be provided where the app--lication demands the need for higher pressure operation.

Applications

- *Precious metal recovery*
- *Caustic and acid recovery using our special HFN series*
- *Concentration of proteins, amino acids, and vitamins in food, beverage and pharmaceutical industry.*
- *Dye concentrations and desalting*

Advantages

- *High thermal and chemical resistance*
- *High quality raw material in module making*
- *Sanitary design without dead space*
- *High resistance to fouling*
- *Simple and economic module replacement*
- *High packing density*
- *Various choices of module dimensions*

SPIRAL RO MEMBRANES FOR PROCESS

Cross flow Reverse Osmosis is a pressure–driven membrane process capable of separating water from its solutes, in applications such as desalination of sea water, brackish water etc. In process applications RO plays an important part in concentration and dewatering of dilute solutions as an upstream, low-energy concentrator prior to a thermal step.

Process ROs are available in three variants: High-temperature and alcohol stable– HST series (upto 70 deg and stable in methanol and ethanol; Hot-water sanitizable elements for ultrapure water applications – HST HP series.

RO membranes operate between 5 to 40 bar pressure. Elements suitable for (up to) 80 bar can also be provided where the application demands the need for higher pressure operation.

Advantages

- *High thermal and chemical resistance*
- *High quality raw material in module making*
- *Sanitary design without dead space*
- *High resistance to fouling*
- *Simple and economic module replacement*
- *High packing density*
- *Various choices of module dimensions*