

# Concentration & Demineralization

Whey has a fairly high salt content, about 8-12% of dry matter. Demineralization (also known as desalination or de-ashing) enhances the nutritional value of whey products by removing salts and reducing the content of organic ions, such as lactates and citrates. In early dairy systems, whey was concentrated by evaporation and subsequently demineralized by electro dialysis and/or ion-exchange. While these methods are still used for highly mineralized whey products, nanofiltration (NF) is an advanced alternative for partial demineralization of whey.

NF membranes have a high permeability for monovalent salts (e.g. sodium, potassium and chloride) and a very low permeability for organic compounds (e.g. lactose, proteins and urea). The complex divalent (e.g. calcium) and multivalent ions (e.g. phosphate) are retained by the NF membrane. The use of NF to partially (25-30%) demineralize the whey products instead of evaporation followed by electro dialysis and/or ion-exchange has the advantage of simultaneous concentration and demineralization of whey, reducing processing costs. Diafiltration may also be used to achieve whey demineralization up to 45%. NF may also be used as a preliminary step to more complete (90-95%) demineralization of whey by electro dialysis and ion-exchange.

TurboClean® Food & Dairy NF elements using [TRISEP® TS40 NF membrane](#) are commonly used in dairy processing to concentrate and demineralize whey products. Combined with our sanitary TurboClean outer shell, these membranes are ideal for whey protein concentration and demineralization. These TurboClean NF elements are available using feed spacers of various thicknesses to account for the total solids present.

To meet specific, customer requirements, MANN+HUMMEL Water & Fluid Solutions offers various other [NF membranes](#) with a wide range of feed spacers including 31 mil diamond, 46 mil diamond, 47 mil parallel and 65 mil diamond. For more information or questions, please contact MANN+HUMMEL Water & Fluid Solutions.

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