

### **Membrane separation systems based on I-2-M Cera-Dur (hollow fibre ceramic membranes)**

InNow India Pvt. Ltd. in association with i2M (a MAN-MUMMEL Group Company) offers high quality separation solutions using Cera-Dur hollow fiber ceramic membrane systems. These UF/MF systems separate highly aggressive solid, chemical and oily contamination from industrial wastewater and produced water.

Designed on In-Out configuration, Cera-Dur membranes are available in pore size cut-offs varying from 130 nm to 30 nm & offer wide spectrum filtration covering microfiltration and ultra-filtration. These membranes based on proprietary design provide best in class chemical & mechanical resistance and offer benefits of low operation cost, low fouling risks & low adhesion potential for high quantity of suspended solids.

InNow systems on Cera-Dur modules can treat feed water of following feed characteristics ensuring consistent operation on stable flux and high-quality permeate. The skids are designed with unique backwash strategy to remove the fouling layers and extend the operating life of the modules.

Feed water Limits	
TSS	100,000 ppm
COD	20,000 ppm
Oil	5000 ppm

Cera-Dur modules provide distinct advantage of compatibility with wide range of chemicals at higher temperature. The lumen size of each module is constructed to enable easy cleaning without much cleaning chemicals.

Operating Parameters	
Flow type	In-out
Filtration	Cross-flow
Flux rate (operational)	50-100 LMH
Cross flow velocity (CFV) <sup>+</sup>	1-3 m/s
Operating TMP <sup>+</sup>	Max 2.0 bar
Operating temperature	Max 80°C
Operating pressure <sup>*</sup>	Max 3.0 bar
Back wash pressure <sup>*</sup>	Max 3.5 bar
pH conditions	2-12 at 40°C 2-10 at 80°C

### Advantages of Cera-Dur

Parameters	Polymer membranes	Multi channel Ceramic membranes	Cera~Dur 5.5
Pore size distribution	Moderate	Moderate	Excellent
Fouling behavior	High	Moderate	Low
Stable flux performance (Feed water with high solids)	20-30 L/m <sup>2</sup> /h	40-60 L/m <sup>2</sup> /h	50-100 L/ m <sup>2</sup> /h
Chemical resistance (Chlorine, Strong acid, Base)	Very low	High	High
Cleaning cycles / costs	High	Moderate	Low
Water usage for back wash	High	High	
Operating Temperature range	30-40°C	70-80°C	70-80°C
Adhesion potential for organic molecules	High	Moderate	Low
Membrane costs	Low	High	moderate

