



BLEN Enterprises Limited

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LIQUID/SOLID SEPARATION PERMEABLE CERAMIC MEMBRANE LITERATURE

Types	
CERF™	Product Codes: 35.3.1µ Rnd and 15.3.1µ Rnd
CERF™	Product Codes: 35.3.10µ Rnd and 15.3.10µ Rnd
CERF™	Product Code: 60.40.3.1µ Rct and 60.40.3.10µ Rct

The **CERF™ Permeable Ceramic Membrane** material process from BLEN Enterprises Ltd (BEL) is novel and highly refined. The material is a SiAlON composite, which has superior thermal, mechanical and chemical properties. These properties have obvious advantages over polymeric types, particularly when used in hostile environments such as corrosive liquids and high temperature and pressure situations.

Greater rejection of solutes or particulates in a feed system can be achieved with a **CERF™** membrane due to their highly controlled structure, thickness and porosity. The thickness of the micro layer is 20 µm on a 3 mm substrate. The average pore size of the micro layer is < 1 µm and the pore size of the substrate is < 10 µm. These sizes can be varied to suit a particular application. BEL now has the capability to produce ceramics of different sizes and complexities.

Table 1. The results of molecular rejection rates of different **CERF™** silicon nitride UF formulations with a nominal 0.01 µm track etched polycarbonate filter gave the following results:

CERF™ Specimen	Water Flux (1 h⁻¹ m⁻² bar⁻¹)	Dextran Mw ≈ 500000 (% Rejection)	Typosin Mw ≈ 23000 (% Rejection)	Bovine Serum Albumin Mw ≈ 67000 (% Rejection)
SiN1	7755	nil	18.1	7.3
SiN2	379	nil	10.6	3.6
SiN3	2.9	nil	55	43
PCTE	88	nil	25.5	11

Table 1

Table 2. Effects of precursor resin content on the properties of 3 mm thick **CERF™** silicon nitride support.

Pore Size measurement

CERF™ Batch No.	Batch Size	Density (kg m⁻³)	Porosity (%)	Max Flow Pore (µm)	Mean Flow Pore (µm)	Water Permeability (x 10¹⁴ m²)	Water Flux (1 h⁻¹ m² kPa⁻¹)
SN1 (0% resin)	15	1550	51	1.2	0.5	9	125
SN1 (10% resin)	4	1120	64	8.0	1.8	31	357
SN3 (20% resin)	15	1050	67	12.3	3.2	68	879
SN4 (30% resin)	6	860	73	33.6	9.0	208	1662
SNS (40% resin)	3	620	81	33.7	10.7	410	3551

Table 2

The water flux rate for **CERF™ 36.3.10 & 15.3.10 & 60.40.3.10** is higher at approximately 400,000 (lh⁻¹m⁻² kPa⁻¹).

The water flux rate may be varied during **CERF™** processing to suit a particular application and BEL will assist in determining this rate. Other sizes are possible please contact us with your requirements.



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CERF™ Physical Characteristics					
CERF™ Type	Size	Thickness	Substrate pore	Filter layer	Filter layer thickness
	mm	mm	µm	µm	µm
35.3.1µ Rnd	35	3	10	<1	20
15.3.1µ Rnd	15 dia	3	10	<1	20
60.40.3.1µ Rct	60x40	3	10	<1	20
35.3.10µ Rnd	35 dia	3	10	n/a	0
15.3.10µ Rnd	15 dia	3	10	n/a	0
60.40.3.10µ Rct	60x40	3	10	n/a	0

Table 3

There is no appreciable deterioration or weight loss to **CERF™** in use using a wide range of fluids under aggressive applications and atmospheres. Back flushing is possible using any solvent that will remove the debris.