

DYNAPERM<sup>®</sup> has application in many stream and effluent treatment processes such as:

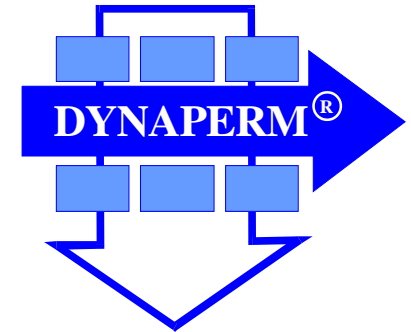
- *Pretreatment* for suspended solids removal prior to reverse osmosis, carbon adsorption, or ion exchange treatment
- *Polishing* for removal of fine suspended solids after chemical or biological treatment
- *Liquid Reuse* when this is otherwise impeded by the presence of suspended solids
- *In-Plant Processes* for valuable material recovery
- *Toxic Heavy Metals Removal* when in suspended form
- *Treatment* for discharge



DYNAFLOW, INC. is an applied sciences research and development company. The capabilities of DYNAFLOW, INC. span the spectrum of product development, experimentation, testing, software development, analysis, numerical simulation, and experience in:

*Fluid Mechanics*  
*Acoustics*  
*Flow Oscillation, Vibration,*  
*& Sound Generation*  
*Dynamic Materials Properties*  
*Stress Wave Propagation*  
*Material Erosion due to Drop Impact*  
*Fluid-Structure Interactions*  
*Material Science*  
*Multiphase Flows*  
*Material Erosion due to Cavitation*  
*Underwater Explosions*  
*Flow Visualization*  
*Liquid & Air Filtration*  
*Computational Fluid Dynamics*  
*Tomography*  
*Water Jet Technology*  
*Software for Science*

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**DYNAPERM<sup>®</sup>**  
*Enhanced*  
*Particle Filtration*  
*From Liquids*

DYNAFLOW, INC.  
Research & Development  
in Applied Sciences



DYNAPERM® is a DYNAFLOW, INC. patented filtration system capable of flux rates twenty fold higher than conventional cross flow filtration systems with comparable or improved effluent quality.

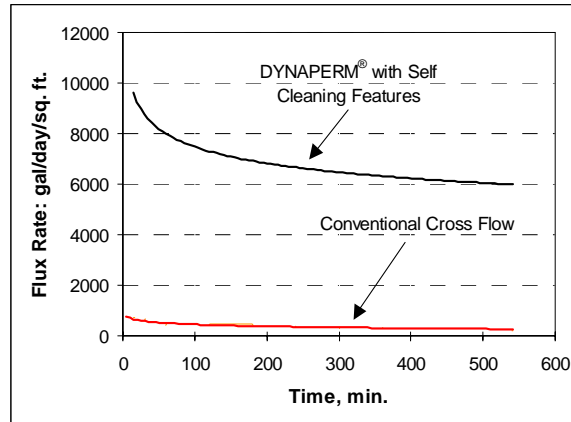


DYNAPERM® entails innovative concepts to greatly increase the efficiency and economy of particle removal from liquids by combining features of cyclone separation, flow interruption and cross-flow filtration thus employing multiple mechanisms of particle separation and enabling periodic shedding of the particle built up on the porous tube wall.

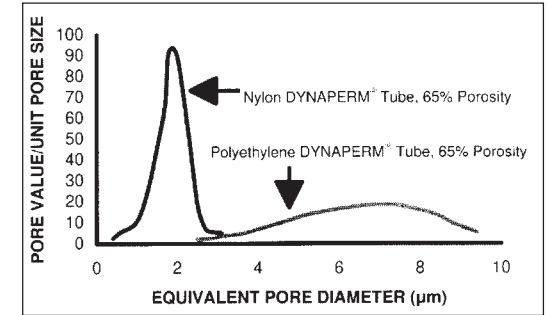
TYPE		TS (mg/l)	SS (mg/l)	Pb (mg/l)	Cu (mg/l)	Zn (mg/l)	Ni (mg/l)	Sb (mg/l)	As (mg/l)	Cr	Cd
Battery Waste	Feed	27,260	24,600	54.2	0.330	0.880	0.400	1.350	0.172	NA	NA
	Filtrate	2980.6	0.6	<0.04	0.015	0.007	0.032	0.292	<0.002	-	-
	% Removal	89.10	99.99	99.93	95.45	99.20	92.00	78.37	98.84	-	-
Plating Waste	Feed	5940	4010	NA	3.85	800.0	120.0	NA	NA	90.0	11.5
	Filtrate	2250	2	-	0.42	1.44	2.16	-	-	0.00	0.06
	% Removal	62.0	99.99	-	89.1	99.8	98.2	-	-	100	99.5

Example electroplating results with DYNAPERM® tubes.

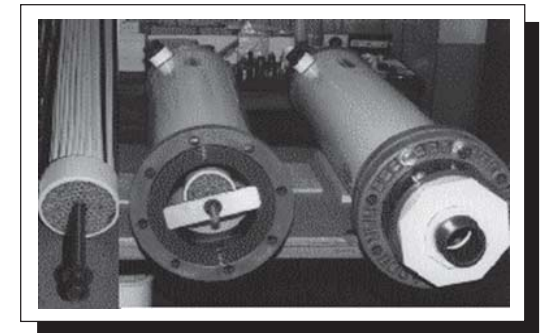
DYNAPERM® is based on a cross-flow microfiltration concept which utilizes thick-walled microporous plastic tubes. The pore structure and micron range pore sizes are controlled during the manufacturing process. These tubes can be made from a variety of extrudable thermoplastics, are rugged and chemically and biologically inert.



DYNAPERM® filtration rates on water obtained from high pressure jet stripping of rust.



DYNAPERM® tubes pore size distribution.



DYNAPERM® filtration components.

DYNAPERM® enables greatly increased flux rates with minimal down time for near complete removal of suspended particles down to the micron size.

DYNAPERM® is a registered trademark of DYNAFLOW, INC.