



# TuffPEM™ 20 Series Membranes

## Product Information

Notark TuffPEM™ are hydrocarbon based, fluorine-free proton exchange membranes designed to provide high proton conductivity with low swell in water. Typical applications for TuffPEM include moisture separation, redox flow batteries, water purification and treatment, electrolyzers and ion selective separation processes such as direct lithium extraction or electrochemical synthesis. TuffPEM membranes offer excellent durability in solutions of pH from 1 to 14. TuffPEM is recommended for applications with maximum continuous service temperature of 80°C.

## Features & Benefits

High proton conductivity	Excellent hydrogen barrier
Stability in broad pH range	Stable in presence of alcohol
Ultra-low swell & dimensional stability	Excellent long-term durability

## Typical TuffPEM 20 PBX5 Properties

	Conditions	Typical Value	
		TuffPEM 20 PBX5	TuffPEM 20 HXL
Membrane thickness	Dry, $\mu\text{m}$	20 - 60 $\mu\text{m}^*$	20 - 60 $\mu\text{m}^*$
Ion Exchange Capacity	Titration	2.0 meq/g	2.0 meq/g
Membrane Resistance	25°C, 2M NaCl	0.92 $\Omega\text{cm}^2$	1.00 $\Omega\text{cm}^2$
Proton Conductivity	60°C/80°C	127/200 mS/cm	105/170 mS/cm
Water Uptake	80°C, 24 hours	<15%	<10%
	25°C, 4 weeks	<15%	<10%
Tensile Strength	Dry, 25°C, 2in/min	30 MPa	40 MPa
Elongation at Break	Dry, 25°C, 2in/min	6.3 %	5 %
pH Stability	pH range	1 to 14	1 to 14
Iron crossover (20 CPBX5)	Fe <sup>3+</sup> diffusion rate	$\leq 0.001 \text{ mol/hr.m}^2$	$\leq 0.001 \text{ mol/hr.m}^2$
Permselectivity	0.5M KCl/0.05M KCl	99.5%	>99.5%
Water Vapor Transmission Rate	50°C, 10% RH, inverted cup	83,000 l/m <sup>2</sup> .day	50,000 l/m <sup>2</sup> .day

\*Alternative thicknesses are available, contact us for additional information.



## TuffPEM 20 Series Related Products and Description

	Form	Thickness	Comment
<b>TuffPEM 20</b>	Free standing	10, 20µm	Ionomer, soluble*
<b>TuffPEM 20PBX5</b>	Free standing	20 - 60µm	Crosslinked*
<b>TuffPEM 20CPBX5</b>	Composite	20 GSM	Composite membrane (200µm microporous polyethylene substrate)

\*Free standing membranes are shipped with a removable PET underlayment.

## Additional Information

	Details
<b>Packaging</b>	Standard reels are 3" core, 1ft wide. Special configurations can be made available.
<b>Storage Recommendation</b>	Room temperature. Avoid storage in direct sunlight.
<b>Safe Handling</b>	Read the GHS Data Sheet carefully and thoroughly before handling and using the product. For a copy of the GHS datasheet, please contact us at <a href="mailto:support@notark.com">support@notark.com</a>

### Disclaimer

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