

# Celgard® 2500

## PRODUCT INFORMATION

### Name

Celgard® 2500

### Description

25 µm Microporous Monolayer Membrane (PP)

### Primary Application

High-Rate and Low Temperature Primary Lithium Batteries

### Product Features

- 25 µm microporous monolayer membrane (PP)
- Excellent resistance to acids, bases & most chemicals
- Uniform pore structure with high chemical and thermal stability
- Low electrical impedance and high porosity provide high-rate capabilities
- Zero TD shrinkage reduces internal shorting and improves high temperature dimensional stability
- Oxidation resistance for excellent cycling and trickle charge performance



## Technical Data (Typical Properties)

Basic Film Properties	Unit of Measure	Typical Value
Thickness	µm	25
Gurley (JIS)	Seconds	200
Porosity	%	55
PP Pore Size (Avg. Diameter)	µm	0.064
TD Shrinkage @ 90° C /1 Hour	%	0
MD Shrinkage @ 90° C /1 Hour	%	5
Puncture Strength	Grams	335
Tensile Strength, MD	Kg/cm <sup>2</sup>	1055
Tensile Strength, TD	Kg/cm <sup>2</sup>	135

## Packaging

- This product can be ordered on 400m, 800m, 1000m, and 1600m length rolls.
- Standard metric slitting is available in a variety of widths ranging from 11.0 to 93.0 mm.
- Please contact your Celgard representative for more information on Metric slit widths greater than 93.0 mm, English slit widths, or non-standard core widths.



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# Celgard® 3400

## PRODUCT INFORMATION

### Name

Celgard® 3400

### Description

25 µm Microporous Monolayer Membrane (PP), Surfactant-Coated

### Primary Application

Aqueous Electrolyte Battery Systems; Vented NiCd Batteries

### Product Features

- 25 µm microporous monolayer membrane (PP)
- Surfactant-coated for rapid wetting
- Gas barrier provides thermal stability
- Low foaming performance - well suited for applications where gas is generated
- Zero TD shrinkage reduces internal shorting and improves high temperature dimensional stability



## Technical Data (Typical Properties)

Basic Film Properties	Unit of Measure	Typical Value
Thickness	µm	25
Gurley (JIS)	Seconds	620
Porosity	%	41
PP Pore Size (Avg. Diameter)	µm	0.043
TD Shrinkage @ 90° C /1 Hour	%	0
MD Shrinkage @ 90° C /1 Hour	%	5
Puncture Strength	Grams	450
Tensile Strength, MD	Kg/cm <sup>2</sup>	1420
Tensile Strength, TD	Kg/cm <sup>2</sup>	140

## Packaging

- This product can be ordered on 400m, 800m, 1000m, and 1600m length rolls.
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# Celgard® 3401

## PRODUCT INFORMATION

### Name

Celgard® 3401

### Description

25 µm Microporous Monolayer Membrane (PP), Surfactant-Coated

### Primary Application

Aqueous Electrolyte Battery Systems

### Product Features

- 25 µm microporous monolayer membrane (PP)
- Surfactant-coated for rapid wetting
- Uniform pore structure with high chemical and thermal stability
- Zero TD shrinkage reduces internal shorting and improves high temperature dimensional stability
- Oxidation resistance for excellent cycling and trickle charge performance



## Technical Data (Typical Properties)

Basic Film Properties	Unit of Measure	Typical Value
Thickness	µm	25
Gurley (JIS)	Seconds	620
Porosity	%	41
PP Pore Size (Avg. Diameter)	µm	0.043
TD Shrinkage @ 90° C /1 Hour	%	0
MD Shrinkage @ 90° C /1 Hour	%	5
Puncture Strength	Grams	450
Tensile Strength, MD	Kg/cm <sup>2</sup>	1420
Tensile Strength, TD	Kg/cm <sup>2</sup>	140

## Packaging

- This product can be ordered on 400m, 800m, 1000m, and 1600m length rolls.
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# Celgard® 3500

## PRODUCT INFORMATION

### Name

Celgard® 3500

### Description

25 µm Microporous Monolayer Membrane (PP), Surfactant-Coated

### Primary Application

Aqueous Electrolyte Battery Systems

### Product Features

- 25 µm microporous monolayer membrane (PP)
- Surfactant-coated for rapid wetting
- Low electrical impedance provides good rate capabilities
- Low foaming performance - well suited for applications where gas is generated
- Oxidation resistance for excellent cycling and trickle charge performance



## Technical Data (Typical Properties)

Basic Film Properties	Unit of Measure	Typical Value
Thickness	µm	25
Gurley (JIS)	Seconds	200
Porosity	%	55
PP Pore Size (Avg. Diameter)	µm	0.064
TD Shrinkage @ 90° C /1 Hour	%	0
MD Shrinkage @ 90° C /1 Hour	%	5
Puncture Strength	Grams	335
Tensile Strength, MD	Kg/cm <sup>2</sup>	1055
Tensile Strength, TD	Kg/cm <sup>2</sup>	135

## Packaging

- This product can be ordered on 400m, 800m, 1000m, and 1600m length rolls.
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# Celgard® 3501

## PRODUCT INFORMATION

### Name

Celgard® 3501

### Description

25 µm Microporous Monolayer Membrane (PP), Surfactant-Coated

### Primary Application

Aqueous Electrolyte Battery Systems

### Product Features

- 25 µm microporous monolayer membrane (PP)
- Surfactant-coated for rapid wetting
- Low electrical impedance provides good rate capabilities
- Zero TD shrinkage reduces internal shorting and improves high temperature dimensional stability
- Oxidation resistance for excellent cycling and trickle charge performance



## Technical Data (Typical Properties)

Basic Film Properties	Unit of Measure	Typical Value
Thickness	µm	25
Gurley (JIS)	Seconds	200
Porosity	%	55
PP Pore Size (Avg. Diameter)	µm	0.064
TD Shrinkage @ 90° C /1 Hour	%	0
MD Shrinkage @ 90° C /1 Hour	%	5
Puncture Strength	Grams	335
Tensile Strength, MD	Kg/cm <sup>2</sup>	1055
Tensile Strength, TD	Kg/cm <sup>2</sup>	135

## Packaging

- This product can be ordered on 400m, 800m, 1000m, and 1600m length rolls.
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# Celgard® 4550

## PRODUCT INFORMATION

### Name

Celgard® 4550

### Description

38 µm Microporous Trilayer (PP/PE/PP) Membrane, Laminated to a Polypropylene Nonwoven Fabric

### Primary Application

Primary Lithium Batteries

### Product Features

- Thick, multi-layer construction provides increased strength and high puncture resistance
- PP nonwoven laminate enables high electrolyte retention for long working life
- Oxidation resistance for excellent cycling and trickle charge performance
- Zero TD shrinkage reduces internal shorting and improves high temperature dimensional stability
- PE inner layer provides high-speed shutdown



### Technical Data (Typical Properties)

Base Film Properties	Unit of Measure	Typical Value
Thickness	µm	38
Gurley (JIS)	Seconds	780
Porosity	%	45
PP Pore Size (Avg. Diameter)	µm	0.035
TD Shrinkage @ 90° C / 1 Hour	%	0
MD Shrinkage @ 90° C / 1 Hour	%	7
Puncture Strength	Grams	540
Tensile Strength, MD	Kg/cm <sup>2</sup>	1200
Tensile Strength, TD	Kg/cm <sup>2</sup>	115
Laminated Film Properties	Unit of Measure	Typical Value
Thickness	µm	110

### Packaging

- This product can be ordered on 400m, 800m, 1000m, and 1600m length rolls.
- Standard metric slitting is available in a variety of widths ranging from 11.0 to 93.0 mm.
- Please contact your Celgard representative for more information on Metric slit widths greater than 93.0 mm, English slit widths, or non-standard core widths.



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# Celgard® 4560

## PRODUCT INFORMATION

### Name

Celgard® 4560

### Description

25 µm Microporous Monolayer Polypropylene Membrane, Laminated to a Polypropylene Nonwoven Fabric

### Primary Application

Primary Lithium Batteries

### Product Features

- Thick, multi-layer construction provides increased strength and high puncture resistance
- PP nonwoven laminate enables high electrolyte retention for long working life
- Low electrical impedance and electrolyte reservoirs provide high-rate capabilities
- Zero TD shrinkage reduces internal shorting and improves high temperature dimensional stability



## Technical Data (Typical Properties)

Base Film Properties	Unit of Measure	Typical Value
Thickness	µm	25
Gurley (JIS)	Seconds	200
Porosity	%	55
PP Pore Size (Avg. Diameter)	µm	0.064
TD Shrinkage @ 90° C / 1 Hour	%	0
MD Shrinkage @ 90° C / 1 Hour	%	5
Puncture Strength	Grams	335
Tensile Strength, MD	Kg/cm <sup>2</sup>	1055
Tensile Strength, TD	Kg/cm <sup>2</sup>	135
Laminated Film Properties	Unit of Measure	Typical Value
Thickness	µm	110

## Packaging

- This product can be ordered on 400m, 800m, 1000m, and 1600m length rolls.
- Standard metric slitting is available in a variety of widths ranging from 11.0 to 93.0 mm.
- Please contact your Celgard representative for more information on Metric slit widths greater than 93.0 mm, English slit widths, or non-standard core widths.



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# Celgard® 5550

## PRODUCT INFORMATION

### Name

Celgard® 5550

### Description

25 µm Microporous Monolayer Polypropylene Membrane, Laminated to a PP Nonwoven Fabric and Surfactant-Coated

### Primary Application

Zinc-Air Batteries

### Product Features

- Thick, multi-layer construction provides increased strength
- Low electrical impedance provides high-rate capabilities
- Surfactant-coated for rapid wetting
- PP nonwoven laminate enables high electrolyte retention for long working life



## Technical Data (Typical Properties)

Base Film Properties	Unit of Measure	Typical Value
Thickness	µm	25
Gurley (JIS)	Seconds	200
Porosity	%	55
PP Pore Size (Avg. Diameter)	µm	0.064
TD Shrinkage @ 90° C / 1 Hour	%	0
MD Shrinkage @ 90° C / 1 Hour	%	5
Puncture Strength	Grams	335
Tensile Strength, MD	Kg/cm <sup>2</sup>	1055
Tensile Strength, TD	Kg/cm <sup>2</sup>	135
Laminated Film Properties	Unit of Measure	Typical Value
Thickness	µm	110

## Packaging

- This product can be ordered on 400m, 800m, 1000m, and 1600m length rolls.
- Standard metric slitting is available in a variety of widths ranging from 11.0 to 93.0 mm.
- Please contact your Celgard representative for more information on Metric slit widths greater than 93.0 mm, English slit widths, or non-standard core widths.



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