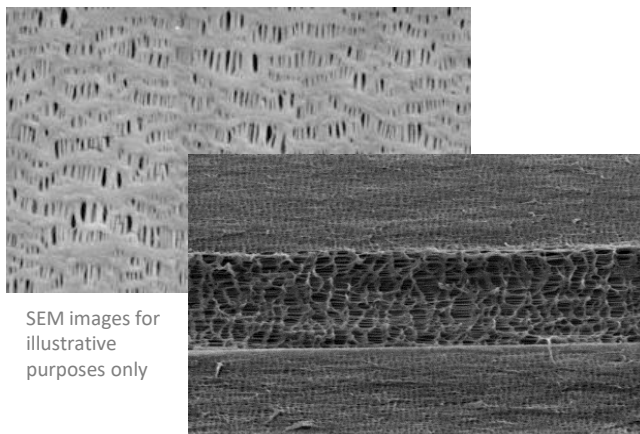


Product Name & Description

Celgard® H2013
20µm Trilayer Microporous Membrane (PP/PE/PP)

Primary Applications

High Energy Lithium Battery Systems; especially safety-critical and performance-critical applications



Product Benefits

- Zero TD shrinkage reduces internal shorting
- Uniform pore structure with high chemical & thermal stability
- High porosity for excellent high-rate performance
- PP outer layer provides high temperature melt integrity, oxidation resistance
- PE inner layer provides high-speed shutdown features
- Ultra-low electrical impedance

Technical Data (Typical Properties)

Basic Film Properties	Unit of Measure	Typical Value
Thickness	µm	20
Gurley (JIS)	Seconds	300
Porosity (calculated)	%	44
TD Shrinkage @ 105°C / 1 Hour (typical)	%	0
MD Shrinkage @ 105°C / 1 Hour (typical / max)	%	3.3 / 6.0
TD Tensile Strength (typical / min)	Kg/cm ²	140 / 120
MD Tensile Strength (typical / min)	Kg/cm ²	1600 / 1100
Puncture Strength (typical / min)	Grams Force (gf)	420 / 320

Packaging

Please contact your Celgard representative for more information on product roll lengths and slit widths.

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WARRANTY: This product is to be used only by persons familiar with its use. It must be maintained within the stated limitations. The product is warranted to be free of any manufacturing defects. No other warranty is expressed or implied. Purchaser assumes all responsibility for the use and safety of this product. To the best of our knowledge, the information contained herein is accurate. However, neither CELGARD, LLC nor any of its affiliates assumes any liability whatsoever for the accuracy or completeness of this information. Final determination of the suitability of any material and whether there is any infringement of patents is the sole responsibility of the user.

Users of any substance should satisfy themselves by independent investigation that the material can be used safely. We may have described certain hazards, but we cannot guarantee that these are the only hazards that exist. Review the Product Safety Data Sheet for environmental, health and safety information related to this product.

