

### Product Name & Description

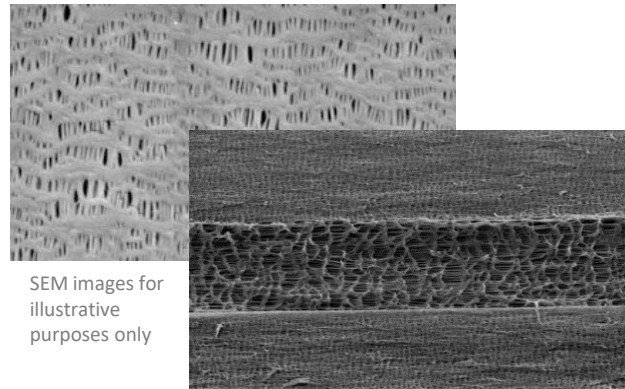
Celgard® 2320  
20µm Trilayer Microporous Membrane (PP/PE/PP)

### Primary Applications

**High Energy** Lithium-Ion Battery Systems; especially those that require additional safety advantages

### Product Benefits

- Zero TD shrinkage reduces internal shorting
- Uniform pore structure with high chemical & thermal stability
- Medium porosity provides excellent energy performance with low self-discharge
- PP outer layer provides high temperature melt integrity, oxidation resistance
- PE inner layer provides high-speed shutdown features



### Packaging

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

## Technical Data (Typical Properties)

| Basic Film Properties                         | Unit of Measure    | Typical Value |
|---|--------------------|---------------|
| Thickness                                     | µm                 | 20            |
| Gurley (JIS)                                  | Seconds            | 530           |
| Porosity (Calculated)                         | %                  | 39            |
| TD Shrinkage @ 105°C / 1 Hour (typical)       | %                  | 0             |
| MD Shrinkage @ 105°C / 1 Hour (typical / max) | %                  | 1.5 / 5.0     |
| TD Tensile Strength (typical / min)           | Kg/cm <sup>2</sup> | 156 / 115     |
| MD Tensile Strength (typical / min)           | Kg/cm <sup>2</sup> | 2040 / 1500   |
| Puncture Strength (typical / min)             | Grams Force (gf)   | 400 / 360     |

### United States

*Headquarters, Manufacturing and R&D at Charlotte*

13800 South Lakes Drive  
Charlotte, North Carolina  
28273 United States

Phone: +1 704-588-5310  
Fax: +1 704-588-5319

*Manufacturing and R&D at Concord*

390 Business Boulevard  
Concord, North Carolina  
28027 United States

Phone: +1 704-720-5200  
Fax: +1 704-720-5211

### Europe, Middle East & Africa (EMEA)

*Sales & Technical Service*

BP 90149  
25 Rue de Westrich  
Sélestat Cedex  
67603 France

Phone: +33 3 88 82 41 08  
Fax: +33 3 55 03 59 03

### Japan

*Sales & Technical Service*

Polypore K.K.  
Hibiya Mitsui Tower  
1-1-2 Yurakucho, Chiyoda-ku,  
Toyko, 100-0006 Japan

Phone: +81 3-6891-3750  
Fax: +81 3-6891-3769

### China

*Manufacturing & Distribution*

Polypore (Shanghai) Membrane  
Products Co., Ltd.  
L1 3rd Floor, No. 207 Tai Gu Road  
WaiGaoQiao Free Trade Zone,  
Shanghai 200131, P.R. China

Phone: +86(21) 5866 6200  
Fax: +86(21) 5868 2891

*Sales & Technical Service*

Celgard Sales Office  
Room 1503-1506, Block 6, Lane 3611  
Zhangyang Road  
Jinqiao International Plaza,  
Pudong New District  
Shanghai, PR China 200136

Phone: +86 21 3813 9910  
Fax: +86 21 3813 9911

### Korea

*Sales & Technical Service*

Polypore Korea, Ltd.  
B-506 10, Baekseokgongdan 1-ro,  
Seobuk-gu, Cheonan-si,  
Chungcheongnam-do, 31094  
Republic of South Korea

Phone: +82 41-905-6001  
Fax: +82 41-905-6099

### India & South Asia

*Sales & Technical Service*

Pragati Mahalakshmi Building,  
Ground Floor, Site No. 62,  
New PID No. 11-51-62, 1st Main Road,  
3rd Cross, Industrial Suburb II Stage,  
Yeshwanthpura,  
Bangalore, India 560022

Phone: +91 80 4256 1104  
Fax: +91 80 4256 1106



**DISCLAIMER, LIMITED WARRANTY:** This product is to be used only by persons familiar with its use. It must be maintained within the stated limitations. Most non-developmental, purchased Celgard products are sold subject to Celgard's then current Sales T&C's. 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. An Article Information Sheet may be available upon request. This product may be provided in confidence under NDA and as such is Celgard Confidential.

