

# DuPont Fuel Cells

## DuPont™ Nafion® PFSA Polymer Dispersions

DE 520/521, DE 1020/1021, DE 2020/2021

### Description

DuPont™ Nafion® PFSA polymer dispersions are made from chemically stabilized perfluorosulfonic acid/PTFE copolymer in the acid (H<sup>+</sup>) form, and are available in several polymer content and dispersant compositions. Typical uses include fabrication of thin films and coating formulations for fuel cell membranes, catalyst coatings, sensors, and a variety of electrochemical applications.

### Typical Composition

Property	Nafion® PFSA Polymer Dispersions by Composition					
	DE 520	DE 521	DE 1020	DE 1021	DE 2020	DE 2021
<b>Polymer Content</b> (wt. %)	5.0 min. 5.4 max.	5.0 min. 5.4 max.	10.0 min. 12.0 max.	10.0 min. 12.0 max.	20.0 min. 22.0 max.	20.0 min. 22.0 max.
<b>Water Content</b> (wt. %)	45 ± 3	45 ± 3	87 – 90	87 – 90	34 ± 2	34 ± 2
<b>VOC Content</b> (wt. %)	50 ± 3	50 ± 3	< 1	< 1	46 ± 2	46 ± 2
1-Propanol	48 ± 3	48 ± 3	–	–	44 ± 2	44 ± 2
Ethanol	< 4	< 4	–	–	< 2	< 2
Mixed Ethers and Other VOCs	< 1	< 1	< 1	< 1	< 1	< 1
<b>Specific Gravity</b>	0.92 – 0.94	0.92 – 0.94	1.05 – 1.07	1.05 – 1.07	1.01 – 1.03	1.01 – 1.03
<b>Available Acid Capacity</b> (meq/g, H <sup>+</sup> polymer basis)	> 1.00	> 0.92	> 1.00	> 0.92	> 1.00	> 0.92
<b>Total Acid Capacity</b> (meq/g, H <sup>+</sup> polymer basis)	1.03 – 1.12	0.95 – 1.03	1.03 – 1.12	0.95 – 1.03	1.03 – 1.12	0.95 – 1.03
<b>Viscosity</b> (cP; at 25°C and 40 sec <sup>-1</sup> Shear Rate)	10 – 40	10 – 40	2 – 10	2 – 10	50 – 500	50 – 500

**Note:** 1 cP = 1 mPa·s

### Order Information

Dispersions are available in the following containers (4-liter minimum order):

4-liter container package (air or land delivery)

20-liter container (air or land delivery)

190-liter drum (land delivery)



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## Safe Handling and Use of Nafion® PFSA Polymer Dispersions

The following information should be reviewed before handling and processing Nafion® PFSA Polymer Dispersions:

- DuPont Material Safety Data Sheets for Nafion® PFSA Polymer Dispersions DE 520/521, DE 1020/1021, DE 2020/2021
- Nafion® Technical Information "Safe Handling and Use"
- "Guide to Safe Handling of Fluoropolymer Resins", Fourth Edition, November 2005, Published by the Fluoropolymers Division of the Society of the Plastics Industry, Inc.

### Handling Practices

Ventilation should be provided for safe handling and processing of Nafion® dispersion. The amount of local exhaust necessary for processing Nafion® dispersion at elevated temperatures will depend on the combined factors of dispersion quantity, temperature, and exposure time.

### Disposal

Refer to the DuPont Material Safety Data Sheet for Nafion® Dispersion. Treatment, storage, transportation, and disposal must be in accordance with applicable federal, state/provincial and local regulations.

### Recommended Storage Conditions

Store between 0°C and 32°C in glass, plastic or stainless-steel containers only. Store in a dry environment, away from direct sunlight, ideally in a temperature-controlled room. Not to be frozen.

### Expected Shelf Life

A shelf life of two years from preparation of dispersion, under appropriate storage conditions, is expected to be a reasonable estimate of product shelf life. Stir or otherwise mix the dispersion while in the original shipping container before dispensing.

### For information about product offerings from DuPont Fuel Cells, contact:

DuPont Fuel Cells  
P.O. Box 80701  
Wilmington, DE 19880-0701, U.S.A.

Telephone: (302) 999-5681  
Domestic U.S.A. only: (800) 436-1336  
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[fuelcells.dupont.com](http://fuelcells.dupont.com)

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The data listed here fall within the normal range of product properties, but they should not be used to establish specification limits nor used alone as the basis of design. This information is based on technical data that DuPont believes to be reliable. It is intended for use by persons having technical skill and at their own discretion and risk. This information is given with the understanding that those using it will satisfy themselves that their particular conditions of use present no health or safety hazards. Because conditions of product use are outside our control, DuPont makes no warranties, express or implied, and assumes no obligation or liability in connection with any use of this information or for results obtained in reliance thereon. The disclosure of the information is not a license to operate under or a recommendation to infringe any patent of DuPont or others.

**Caution:** Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement", H-50102.



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