

# Ion Power

## POWDion™ Perfluorosulfonic acid Powder

### POWDion™

#### Description

POWDion™ is a fine powder made from the NAFION™ perfluorosulfonic acid polymer. POWDion™ comes in a soluble form or an insoluble form. The soluble POWDion™ has an amber color and has the ability to be dissolved using a variety of polar protic solvents such as Isopropanol, Methanol, or Ethanol at polymer concentrations up to 30 wt% polymer, other solvents may also be used. Insoluble powders are white in color and cannot be dissolved with polar protic solvents under normal conditions. Standard particle sizes for POWDion™ include -40+60-mesh, -60-mesh, and -200-mesh. Please note that Insoluble POWDion™ is only available in -40+60-mesh and -60-mesh particle sizes.

### Physical Properties

Nafion® polymer density: 2 g/mL  
EW of Nafion® polymer in powders: 1100

Component	Wt % (Soluble)	Wt% (Insoluble)
Nafion®	92-95	96-98
Water	4-7	2-4
1-Propanol	<1	<1
2-Propanol	<1	<1
Methanol	<1	<1
Mixed Ethers/other VOCs	<1	<1

Mesh Size	Particle Size inches (mm)*
-40+60	0.0098-0.0165 (0.250-0.400)
-60	0.0098 (0.250) and smaller
-200	0.0029 (0.074) and smaller

\*Particle sizes are approximate;

## Dissolution Instructions

The POWDion™ powder can be dissolved in various solvents. Some suggested solvents are:

1. A mixture of iso-propanol and deionized-water as 80: 20 % to 50:50 %, respectively. More water in the solvent mix helps solubility of the powder.
2. Ethanol, anhydrous, denatured, 85% (15% methanol)  
Ethanol is a more effective solvent for the powder. Less heat in the solvent (under 60 degrees C) is needed to solubilize the powder.

### Dissolution Steps:

First, determine how much solvent and POWDion™ powder will be required to prepare a solution with the desired ionomer content. Prepare a flask with a desired quantity of the chosen solvent. Care should be taken to add the powder into the solvent. Heat the solvent mix to the 60-70 °C range on a hot plate. Then add powder slowly and in a small amount each time with continuous stirring. After each small addition, let the powder dissolve fully before making more additions. If too much powder is added, it will form into a gel and stick to the bottom or sides of the flask instead of being in circulation to help its dissolution. If this situation happens, use a spatula to break-up the solid and allow it to float around in the solvent to dissolve.

## Product Labeling and Storage

A self-adhesive product label is on the sealed glass bottle containing the POWDion™. The label indicates the product name, quantity, lot number, mesh size and purchase order number. Please note that the lot number indicates the state of the powder as either Soluble or Insoluble with an "s" or "i", respectively, at the end. Store the polymer at room temperature; keep away from sources of heat.



### POWDion™ Perfluorosulfonic acid powder, Soluble

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**PO#:** 12345  
**QTY:** 5 g  
**Mesh Size:** -40+60  
**LOT#:** 071410-4s

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