

# 高分子電解質膜用複合基材

Nanofiber nonwovens for reinforcement of ion conductive membrane

## 高分子電解質膜の問題点 Current problems of polymer electrolyte

- イオン伝導性を高めるために薄膜化をおこなうと、機械的強度の低下を招いていました・・・

Membranes becoming thinner to improve ion-conductivity have reduced its mechanical strength

- 素材のイオン伝導性を高めるほどその強度の低さが問題になっていました・・・

The higher the conductivity, means the lower the mechanical strength

- 含水時の膜の膨潤が発電性能の低下を招いていました・・・

Swelling of membranes under high humidity have reduced its power generating performance

## 解決 ナノファイバー不織布と複合 Nanofiber reinforcement can be the solution

- 薄膜の強度向上

It improves the strength of thinnest films

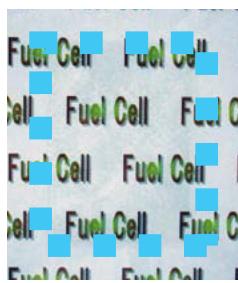
- イオン伝導性の低下が小さい

It has only the smallest effect in reducing conductivity

- 高湿 - 低湿変化による寸法安定性の向上

It improves the dimension stability of membranes under wet-dry conditions

### Conventional electrolyte

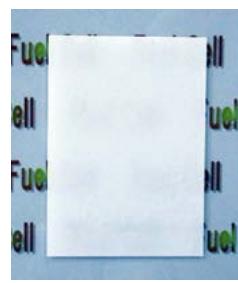


Conductivity:  
 $4.4 \times 10^{-2} \text{ S/cm}$

Mechanical strength:  
9.7 MPa(Wet)

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### Nanofiber nonwoven



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### Nanofiber reinforced



Conductivity:  
 $4.0 \times 10^{-2} \text{ S/cm}$

Mechanical strength:  
14.3 MPa(Wet)