

# Changing of insulation ring

HR-3U(FDK logo tube)

Dec. 2016

FDK CORPORATION  
Ni-MH Battery Group  
Business Development Division

# Changing of insulation ring

## Change notice of insulation ring material

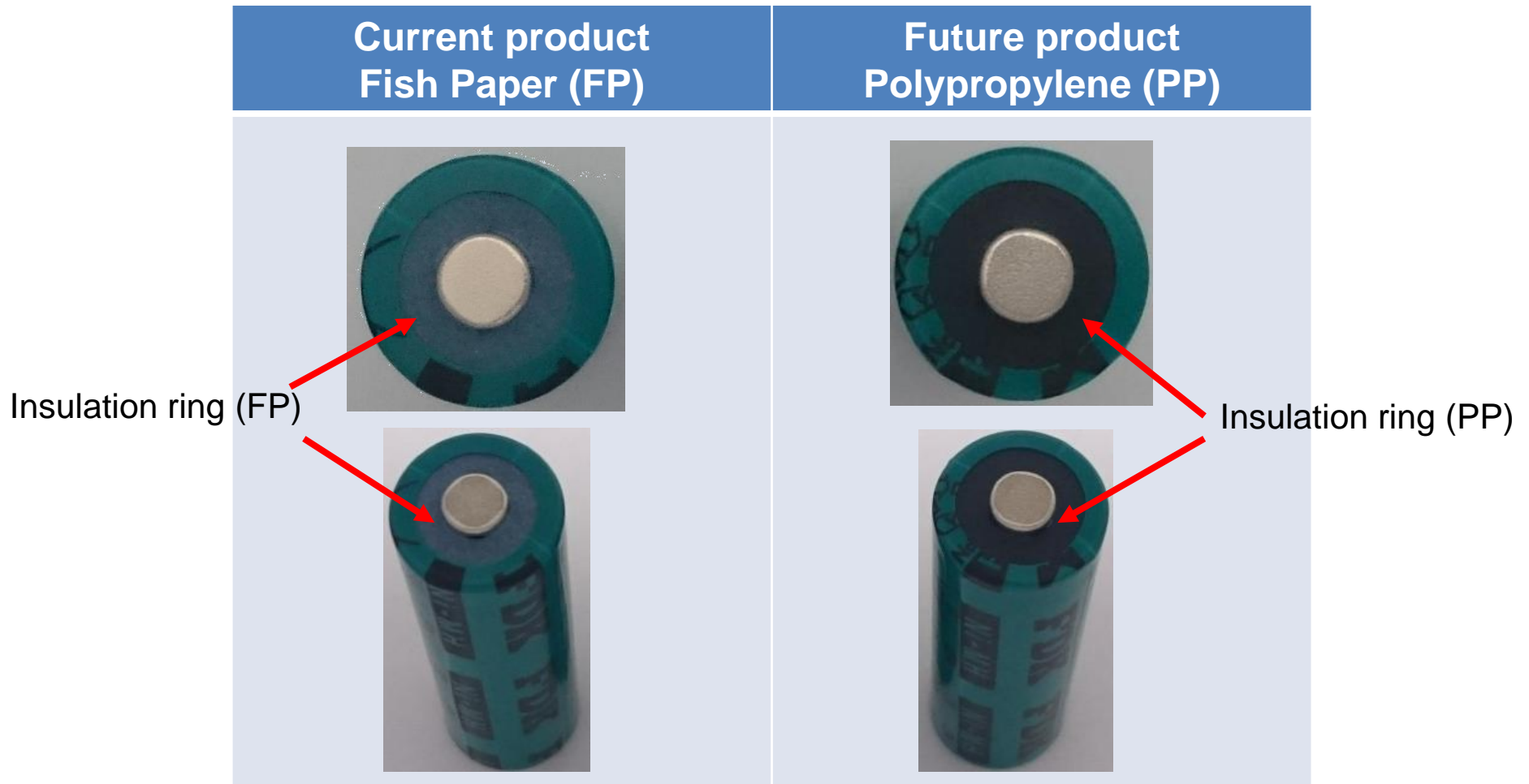
### Background

Currently, insulation ring material of HR-3U used “Fish Paper(FP)”. However, the main customer of HR-3U shifted to “Polypropylene(PP)”. Therefore “FP” usage amount has decreased. In order to maintain a stable cost in the future, please switch to “PP” as well.

Schedule	CY2016		CY2017
	Nov.	Dec.	Jan.
Mass production schedule	Fish Paper (FP)		Polypropylene(PP)

# Appearance comparison

The color of insulation ring changes from gray to black. The surface texture of “PP” comes with gloss.



# Characteristic comparison

	Current product Fish Paper (FP)	Future product Polypropylene (PP)
<b>Material</b>	Paper	Polypropylene
<b>Color and Design ability</b>	Gray Color unevenness	Black Little color unevenness Gloss
<b>Quality</b>	Moisture absorption	No moisture absorption
<b>Insulation performance (Strength)</b>	Weaker than PP	Stronger than FP
<b>Insulation performance (Withstand voltage:500V)</b>	No conduction	No conduction
<b>Heat-resistant performance</b>	Strong	Somewhat weaker than FP (No problem in practical use)

## Fish paper(current product)

Regarding HR-3U, we have used fish paper for insulation ring so far from battery design. As a feature of FP, there were issues such as moisture absorption due to paper and deterioration of appearance due to color unevenness.

## Polypropylene(future product)

The insulation ring of PP has already been operated in some model of standard capacity type. Since the operation method was established with the existing standard capacity type, it is possible to switch without cost increasing in HR-3U.

# Summary

- The colors and textures are different, because materials are different.
- There are slight differences in moisture absorption and heat resistance. However, it is usable without problems, because “PP” has adoption record of except for HR-3U.

We think that changing the insulation ring to “PP” will not cause any problem, so please approve the changing.

The image features a central light green hexagon with the text "Thank you" written in a blue, italicized serif font. Surrounding the hexagon are several cylindrical PDK batteries. The batteries are arranged in a circular pattern around the hexagon, with some positioned inside the hexagon's boundary and others outside. Each battery is green with red and black text, including the brand name "PDK" and "NIMH BATTERY".

*Thank you*