Introduction to AKI-ACE IC Tray™

Advantage (優勢)

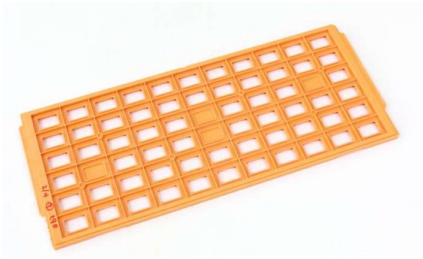
1.Carbon-free (零碳)

2.Carbon-dust-free (零碳塵)

3.Lighter than other tray, saving shipping cost (輕, 省運費)

Features of AKI-ACE

A) Material characteristics



1. Carbon-free IC Tray material

- polymer-based dissipative resin
- use at 150°C
- industry's first mass produced material

2. Cleanest and safest IC Tray material

- no staining, no peeling, and no risk of electrical failure

3. Colorable material
   - standard type: dark brown
   - colored type: orange, blue and gray (customized colors are also possible upon request)

4. Visually identifiable
   - when it is time to replace the tray
5. Dissipative property
   - "low 10^9Ω range" is realized
6. Applicable to pure water washing (for process tray)
   - also durable against high temperature drying

Features of AKI-ACE

B) Features of AKI-ACE JEDEC IC Tray

1. Adoption of new stack design which;
   - significantly improves package (PKG) storage accuracy
   - reduces damage to the package (PKG)
   - mitigates IC Tray and stack defects
2. Lightweight
   - AKI-ACE Tray ： 10～30% lighter (same Tray design)

Reference : weight comparison of different JEDEC trays

	sample 1	sample 2	sample 3	sample 4	sample 5	sample 6	**AKI-ACE**
weight (g) (Pocket Quantity)	204 (364)	165 (112)	185 (96)	123 (12)	149 (4)	163 (4)	**115** **(90)**

*sample 1-6 are all carbon fiber-based trays
**size and the number of pockets of the above trays are not identical

Comparison Table: AKI-ACE vs carbon types

	carbon powder	carbon fiber	carbon nanotube	AKI-ACE PPE Polymer
Heat Resistance	(150℃)	(150℃)	(150℃)	(150℃)
Durability	√ √	√ √	√ √	√ √
Surface Resistivity	10^5~11Ω	10^5~11Ω	10^5~11Ω	10^9Ω
Mechanical Strength	√	√ √	√	√
Carbon Dust	-	√	√ √	√ √ √ (carbon-free)
Cost	√ √	√	-	√
Color Availability	black only	black only	black only	in 3 colors

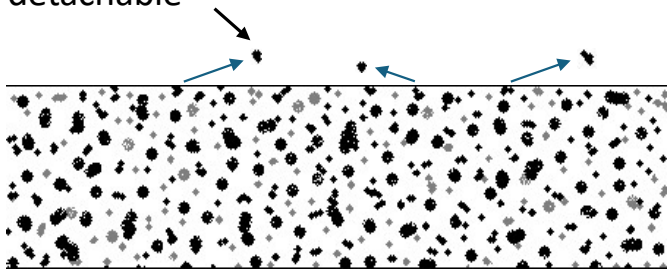
√ √ √: Excellent √ √: Good √: Fair - : Poor

Differences between AKI-ACE and carbon types

Carbon-based conductive materials

- Molten polymer + inorganic filler (carbon-based particles)
- A large amount of foreign matters (individual pieces) are contained in the polymer in an adherent state.

easily detachable



Foreign matter mixed with polymer - Weak adhesion

AKI-ACE antistatic material

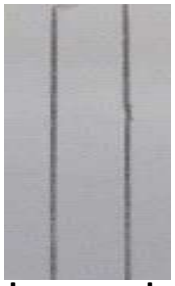
- Molten polymer (A) + Molten polymer (B)
- The state in which polymers with different properties are tightly adhered to each other in a fine and complex shape and are mixed together.

hard to peel off and drop off

Polymer and polymer are melted and mixed -Strong adhesion

The adhesion strength of the carbon-based conductive material is weak, and since it is contained in large quantities, it is likely to fall off easily due to friction and peeling stress.

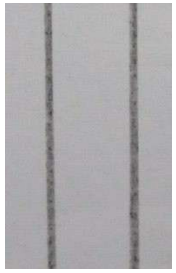
Marking test comparison (1) – visual inspection

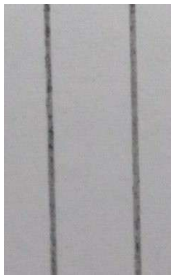

carbon powder

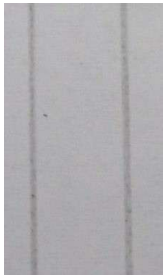

carbon nanotube


AKI-ACE

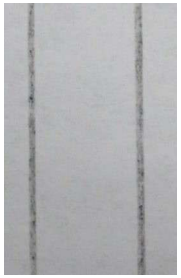
carbon fiber Standard type

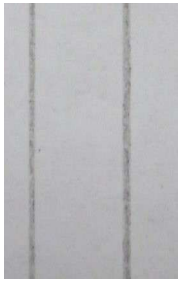

carbon fiber - 1

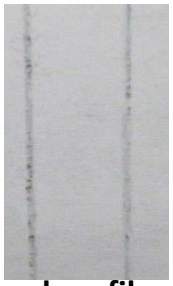

carbon fiber - 2


carbon fiber - 3

carbon fiber Low Particle type


carbon fiber – 4

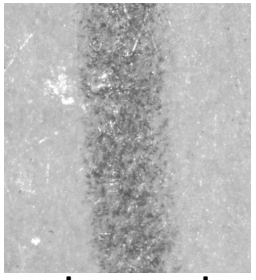

carbon fiber – 5


carbon fiber – 6

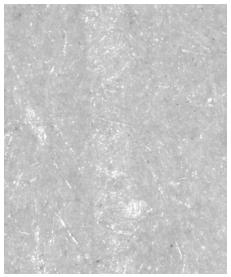

Marking test method

- marking with a ruler

Marking test comparison (2) – magnified by 35x

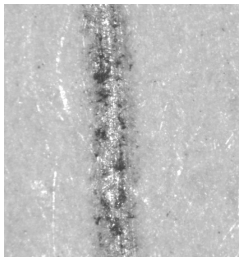

carbon powder

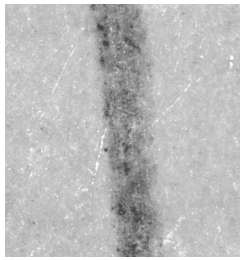

carbon nanotube

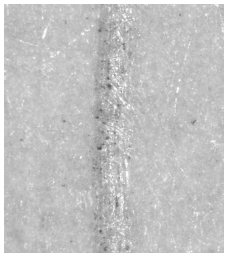

AKI-ACE

AKI-ACE is
can not marking

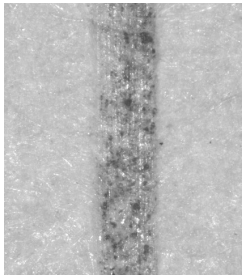
carbon fiber
Standard
type

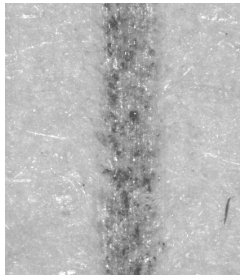

carbon fiber - 1

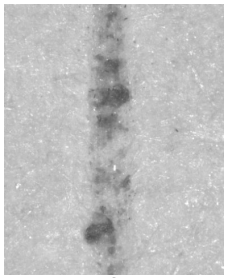

carbon fiber - 2


carbon fiber - 3

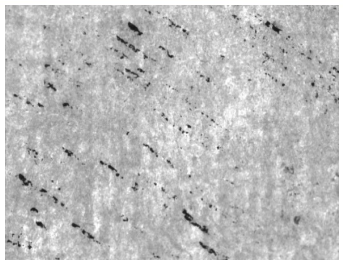
carbon fiber
Low Particle
type


carbon fiber – 4

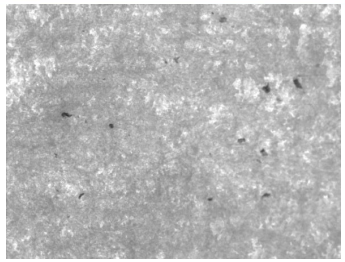

carbon fiber – 5


carbon fiber – 6

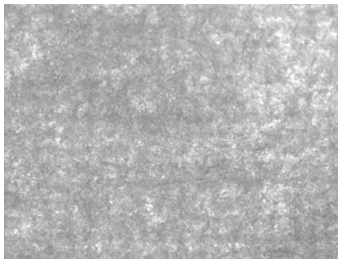
Tape peeling test comparison- magnified by 22x



carbon powder

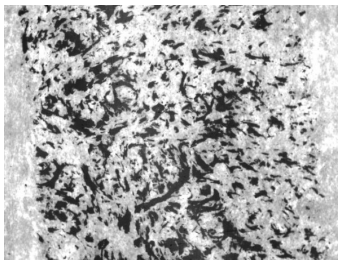


carbon nanotube

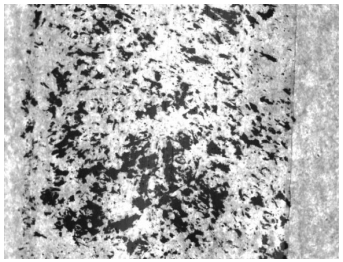


AKI-ACE

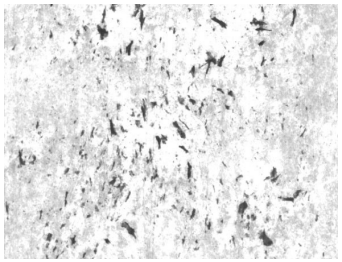
carbon fiber Standard type



carbon fiber - 1

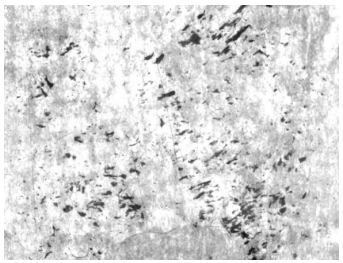


carbon fiber - 2

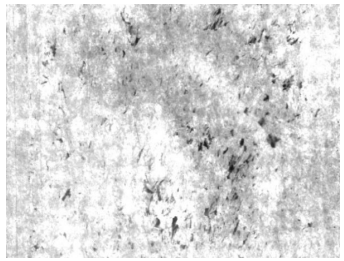


carbon fiber - 3

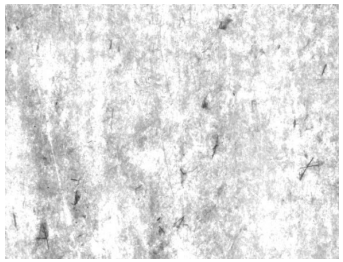
carbon fiber Low Particle type



carbon fiber – 4



carbon fiber – 5

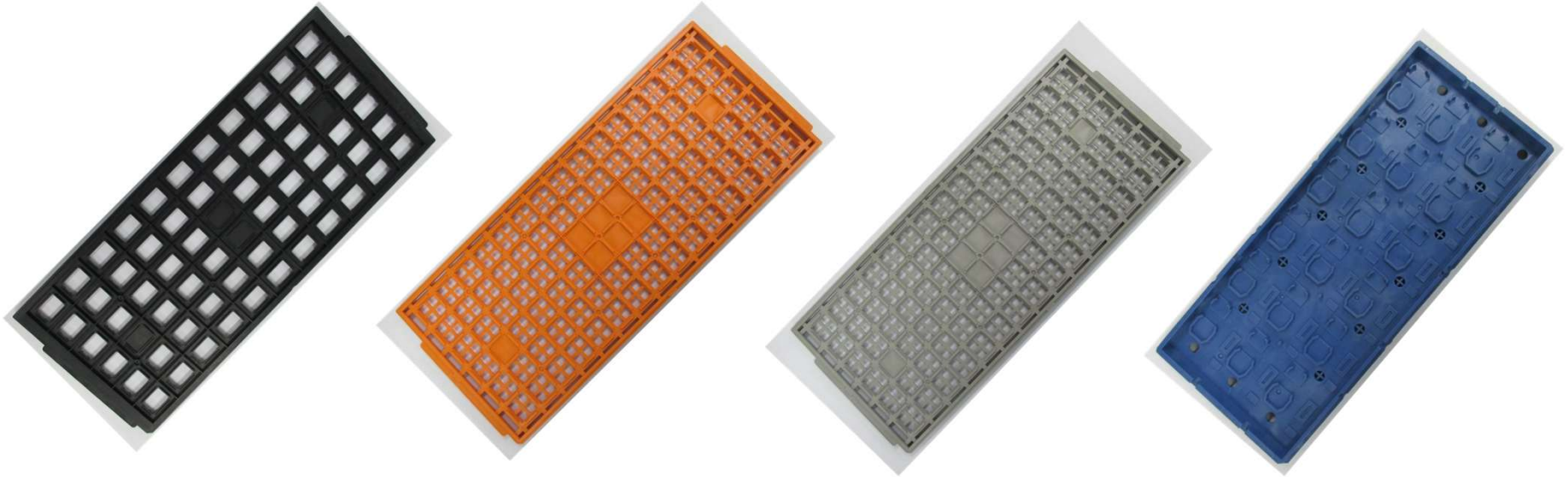


carbon fiber – 6

Tape peeling test method

Apply the tape to the side of the tray and peel it off vigorously while pulling diagonally upward.

Color Availability



Patents

- Material related
  - "Resin Composition Containing Polymer Dissipative Agent and Molded Body“
    - Japanese Patent No.: 7169037 & 7169038 filed on November 1, 2022
    - PCT/JP2021/037907 & PCT/JP2021/038230
  - "Polymer type antistatic agent containing resin composition and molded article”
    - ROC (Taiwan) Patent No.: I 815694 filed on September 11, 2023
    - PCT/JP 2021/038230
- Function related
  - “Method for Determining When to Replace a Container with Another Container and Method for Changing a Container to Another Container”
    - ROC (Taiwan) Patent No.: I 789882 filed on January 11, 2023
    - PCT/JP2020/032391
  - “Container”
    - Japanese Patent No.: 6962635 filed on October 18, 2021
    - PCT/JP2020/032391

- PCT/JP2020/032391 is patent application pending in US
- PCT/JP2021/038230 is under Preparing for patent application/request for examination in US and Korea

Thank you !

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