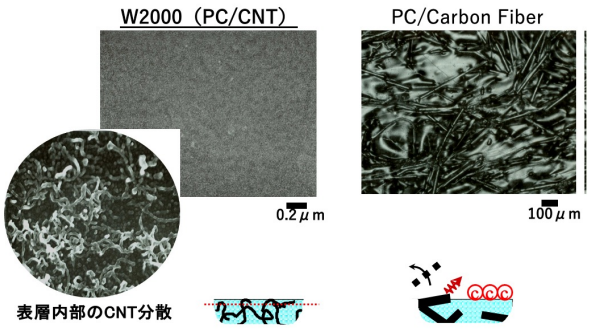
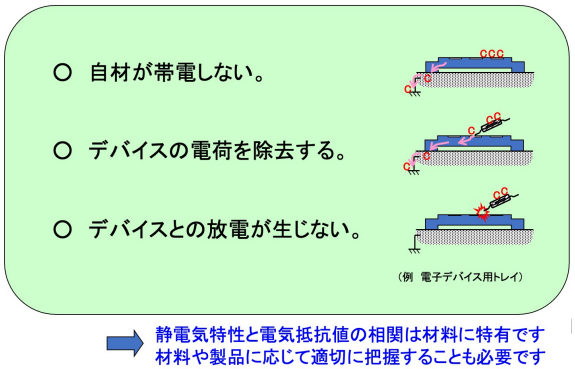
Merits of CNT resin



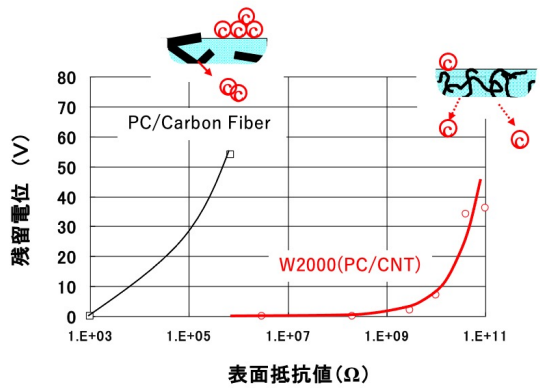
We compared the condition of the surface of the molded product of W2000 (PC / CNT) and PC / CF.
The surface of W2000 is homogeneous and there is no CNT exposure.
When the surface of the molded product is removed, it can be seen that a fine CNT entanglement network is formed inside.
According to this result
・There is no dropout of particles.
・There is no charge or discharge.

W series electrostatic discharge (ESD) prevention characteristics



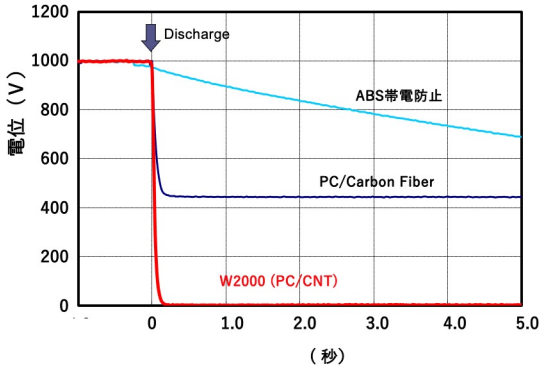
The ideal electrostatic discharge (ESD) performance is "no charge" and "low discharge".
The W series combines these characteristics.

Charge characteristics of W series



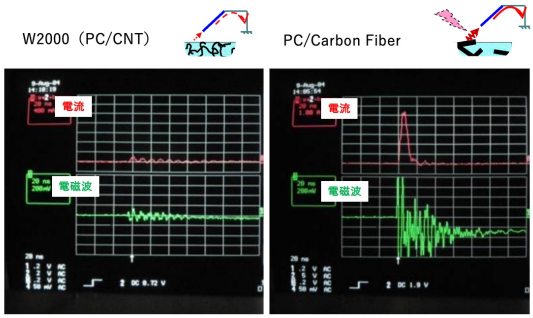
In the W series, charging does not occur even in areas with high surface resistance.
This is because the W series has a fine and dense conductive network of CNTs, so there is no charge accumulation area.

Discharge characteristics of W series



The W series is able to remove the charge of a charged object reliably and quickly.
The graph shows that the 1000 V charge can be removed within 0.1 seconds.

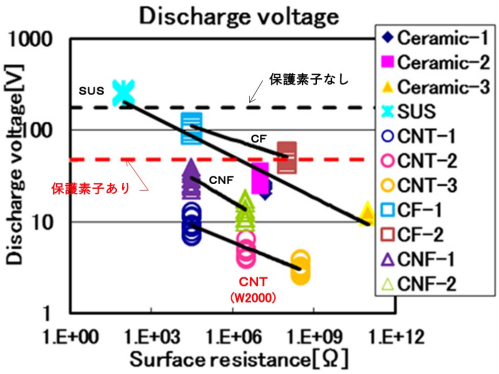
Discharge characteristics of W series



1000Vに帯電させたサンプルを金属プローブでグランドした際の放電

Discharge occurs when charged devices come in contact with antistatic products.
This discharge generates a large current and noise electromagnetic waves that damage the device.
The W series does not cause a large discharge when grounded, and does not damage the device.
This is because the W series conductive network is fine and precise, so there is no charge concentration site.

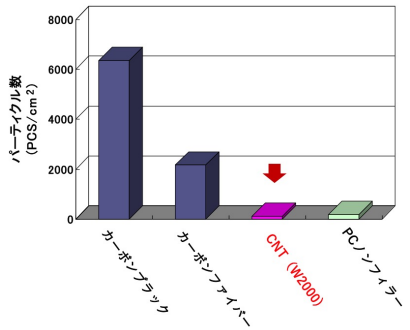
Surface resistance dependence of discharge characteristics of W series



沼津高専電気電子工学科・油化電子共同研究結果より

Generally, the lower the surface resistance, the larger the current and noise generated by the discharge.
W series discharges are very small over a wide surface resistance range.

Dusting property of W series (particles in liquid)



水中に浸漬したサンプルに所定の超音波を印加により
水中に脱落したパーティクル数をカウントした。

When ultrasonically cleaning antistatic products, the conductive filler may fall off (particles in the liquid) and contaminate the cleaning solvent or device.
The W series has very few particles falling off when ultrasonic cleaning.
This is because the W series conductive filler CNT is not exposed on the surface of the antistatic product.

Contamination of W series

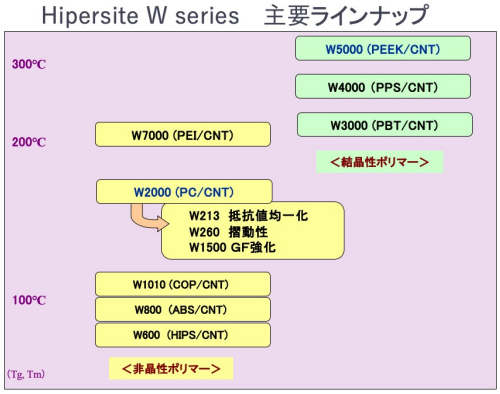
ITEMS		W2000	イオン導電ポリマー
イオンコンタミネーション Ion Contamination(ng/c㎡) 純水中　60°C 1hr	F^-	≦ 5	
	Cl^-	≦ 5	61
	NO^{3-}	≦ 5	
	PO_4^{3-}	≦ 10	
	SO_4^{2-}	≦ 5	30
	Na^+	≦ 5	360
	K^+	≦ 5	14
	NH_4^+	≦ 5	11
アウトガス　Out Gas（μg/g） SHS-GC/MS 85°C 16hr		< 0.2	2.9

W2000の塩素系アウトガス

	W2000	PC−1	PC−2
Dichloromethane	5	154	146
Trichloromethane	0.2	0.05	38
Chlorobenzene	0.7	3.6	3.1
p-Dichlorobenzene	2	1	32
o-Dichlorobenzene	0.7	0.9	1.8
Total chloride	8.7	160	221

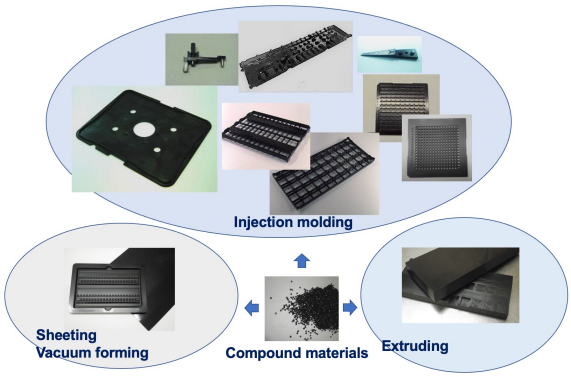
W Series is free from contamination derived from CNT. Here shows data of W2000 (PC/CNT) as an example.
Furthermore, W2000 is free from care of corrosion on devices since chlorinated volatile constituents derived from base resin (PC) is reduced.

Lineup of W series



The W series includes various engineering plastics such as polycarbonate, and also has strength and slidability improvement grades.

Application example of W series



W series, it has been used in a wide range of fields products.