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Introduction of SP-PA6 Master-Batch Nanocomposite

Finely-dispersed Silicate-Plates in Nylon6 and their advanced Properties (2024-6) (SP-PA6 properties and the examples of applications) – patent (Taiwanese 1796926)

Silicate-Plate Clay (SP), Zinc-Oxide (ZnO-NP) and Silver Nano-particles (AgNP) into Nylon and PET, we have developed the following commercially available composite Master-Batch products SP-PA6-added-PA6 products with the properties similar to PA66's ,SP clay-additive enables PA6 of flexural modulus, tensile strength, dimension stability, HDT, CTE, melting flow index, and fire-retarding properties, near to or over PA66, with a significant pricing-advantage. Two Master-Batch products of SP-PA6 (30%) and SP-PA6 (3.0%) in ton-scale.

Example of applications:

- (A) SP-PA6 (3.0%) for Nylon cable ties, with advantages of tensile strength, flexural properties, etc. similar to PA66, and superior properties in reducing process cycle time due to faster crystallization and high temperature tolerance properties.
- (B) SP-PA3 (30%) as fire-retardant substitutes for the conventional Phosphor organics, with advantages of anti-dripping, heatbarrier, anti-fire propagation, and pricing, in reaching UL94V0 properties.
- (C) Improving the process properties of melt-flow Index for high-temperature Nylon such as 6T, 9T,12 processing.





SP-AgNP-PA6 fibers and coating solutions enabling anti-MRSA, anti-biofilm, and anti-virus, potential medical new uses.

Products: SP-PA6 (3.0%) \ SP-PA6 (30%) \ SP-PA6 (50%)



Comparison of PA66 vs. PA6+5% SP Properties

性能	PA66(GP200)	PA6	PA6+5%SP
T _m	265	230	220
抗折強度(MPa)	100	97	131
Flexural strength			
抗折模數(MPa)	2700	2499	3542
Flexural Modulus			
HDT(66psi)	182	149	182
Shrinkage(%)	1.6	1.5	0.24
Water	1.3	-	0.8
absorbance(24hr)			
CTE (10 ⁻⁶ /K)	81	_	30
MI(270°C,2160g)	35	_	48
拉力強度(MPa)	70	69	85
(tensile strength)			
E%	35	230	45





SP-PA6 fire-retardant

成分	重量百分比	阻燃等級	結果
PA6	100		
PA6/SP-X	95/5	V-1	不滴垂
	90/10	V-0	取代磷有機阻燃物

The active ingredients of SP clay, ZnO-NP and Ag-NP have been developed over 20 years of R&D experience and more recently integrated with new extrusion technologies to archive the advanced functions.

In viewing of the international trade-war causing the reshuffling of global material supplying chain and the forthcoming low-CO2emission carbon-credit economics

The nanomaterials enabling Nylon 6 to advance the mechanical properties in matching Nylon 66's represents an important step of altering "old" materials for "new" applications, in this case, for the requisite uses in military, energy, 3C, AI, drones, EV and medicals. The innovation of utilizing these SP-inside technologies is emerging.

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