善贞
SANE ZENCHEM

善贞集团
SaneZen Group

Yori
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进取Enterprising　高效Efficient　共赢Win-Win

---- 橡胶解决方案的服务商
Rubber Solution Provider

Functional reinforcement nano filler--What can we do for the environment?

Nano reinforcing agent PF series features:

GreenThinking

vs Kaolin reinforcement: 50~100% (D50 200 nm)

vs carbon black and ppt silica : low Mooney + large amount of addition + smooth product surface + good air tightness

Many inorganic fillers are mainly derived from minerals, the price is lower, and their application range is becoming more and more extensive. Their use in the rubber industry is almost equivalent to that of carbon black. Especially recently, the research and application of surface modification technology of inorganic fillers have made the application field of inorganic fillers more extensive. Nanomaterials are new materials with special properties, which have the characteristics of small size, large specific surface area, high surface energy and large proportion of surface atoms. Is the rise of new materials in the market. Sane Zenchem is an innovative materials company specializing in the development and production of new materials. Through the research and development of a professional team, we have developed a series of PF functional nano reinforcing fillers (GreenThinking®PF87, PF82, PF81, PF91, PF93, etc.). By the selection of high whiteness natural composite mineral raw materials processing, through the strict internal quality control process, so that the products have a unified chemical purity and stable particle size distribution, refined, most of the particle size distribution in the nano level, after activation treatment, from the appearance, reinforcement and processing dispersion show excellent characteristics, widely used in rubber and plastic industries.

Functional reinforcement nano filler--What can we do for the environment?

非极性橡胶： Non-Polar rubber

EPDM IIIR VMQ等

Reinforcing property

补强： PF87 >PF93> PF91 > PF81 | PF87 >PF91 > PF93 > PF81

压变： PF93 >PF91 > PF81 > PF87 | PF93 >PF91 > PF81 > PF87

Compression set

成本： PF81 >PF87 > PF91 > PF93 | PF81 >PF87 > PF91 > PF93

Cost

过氧化物*硫化体系

纳米补强剂PF

选择矩阵

PF seies Selection matrix

硫磺*硫化体系

Peroxide vulcanization system

Sulfur vulcanization system

补强： PF93 >PF87 > PF81 | PF87 >PF91 > PF93 > PF81

Reinforcing property

压变： PF93 >PF81> PF87 | PF91 >PF93 > PF81 > PF87

Compression set

成本： PF81 >PF87 > PF91 > PF93 | PF81 >PF87 > PF91 > PF93

Cost

极性橡胶： Polar rubber

NBR HNBR CR ACM 等

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Functional reinforcement nano filler--What can we do for the environment?

PAHS

REACH

RoHS

High reinforcement, nano level, environmental protection

- Good insulation
- High reinforcement near N550
- Good aging performance
- Environmentally friendly and odorless
- Synergistic flame retardant
- Good extrudability

Grade	Features
Manufacturer of specialty functional fillers.	
PF series	PF81, PF82, PF87, PF91, PF93, etc., are surface treatment nano strengthening agents that replace rubber filler materials (white carbon black, kaolin, light calcium carbonate, etc.), offering high whiteness, good dispersion, high reinforcement, good insulation, and excellent rebound.
FB10	Fine barite, with a granular structure and extremely high chemical inertness, significantly improves the acid and alkali resistance, and weather resistance of rubber.
RS series	Fumed silica products, with granular structure and high chemical inertness, significantly enhance the wear resistance, insulation, and thermal conductivity of rubber.
WL920 / 720 / 820	Surface treated wollastonite, with a needle-like structure and high aspect ratio, offers excellent reinforcement for rubber and plastics, and has a high cost-performance ratio (replaces 600EST)

GreenThiinking®PF81、PF82、PF87、PF91、PF93 and others are activated nano-reinforcing agents. They are processed from carefully selected high-whiteness natural composite mineral raw materials and undergo a stringent internal quality control process. This ensures that the products have uniform chemical purity and stable particle size distribution. Refined and with most particle sizes distributed at the nanoscale, they have undergone activation treatment and are widely used in industries such as rubber and plastics.

Product advantages:

- **High whiteness： Suitable for the production of light-colored products；**
- **Excellent reinforcing effect, close to N550；**
- **Improves wear resistance, oil resistance, and heat aging performance；**
- **Good air tightness, smooth extruded products： Good dispersion in rubber compounds**
- **Outstanding insulation properties, low compression set;**
- **Extends scorch time and shortens vulcanization time;**
- **High filling rate： Flake structure, high porosity.**

PF81、PF82、
PF91、PF93、
PF95 Standby product

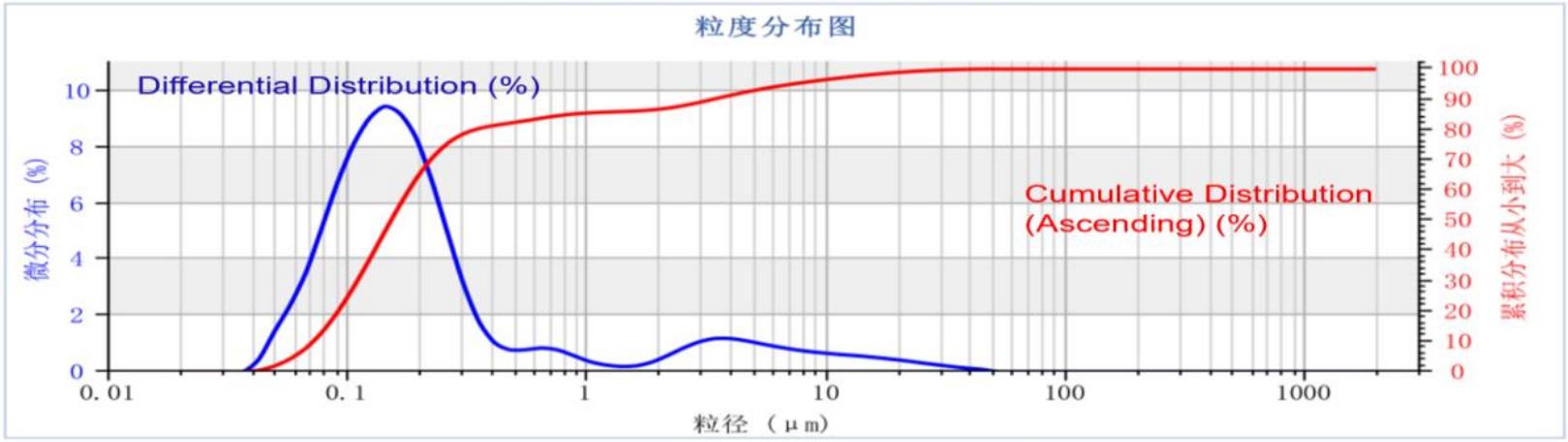
PF87

PF94 Standby product

Particle Size Test Report

Sample Name:	SOP Name:	Measurement Time:	Sample Code:
PF87	Nano Additive SOP	2024/11/8 18:41	0001
Tester:	Background Sampling Time:	Single Sampling Time:	Result Type:
Tiangong Laboratory	9 seconds	9 seconds	Volume (V)
Sample Material:	Refractive Index of Sample Material:	Absorption of Sample Material:	Dispersion Medium:
Nano Reinforcing Agent	1.5	0.01	Water
Refractive Index of Dispersion Medium:	Analysis Mode:	Extinction (%):	Analysis Range (μm):
1.33	General Mode	6.69	0.02 ~ 2000
D10(μm):	D25 (μm):	D50 (μm):	D75 (μm):
0.073	0.102	0.153	0.26
D90 (μm):	D97 (μm):	D(3, 2) (μm):	D(4, 3) (μm):
3.394	11.36	0.138	1.273
Span:	Specific Surface Area by Volume (sq. m/c.c.):	Specific Surface Area by Weight (m²/kg):	Residue on Sieve (%):
21.642	43.609	43609.43	3.614
Dmin Setting Value:	Concentration(%Vol):	C. V (%):	
0.005	0.0057	304.12	

Particle Size Distribution Graph



Particle Size (μm)

Functional reinforcement materials GreenThinking®PF series- EPDM sulfur system

Material	Phr
512E	100
Functional filler	130
Sanepar916	40
ZNO	5
STA	1
PEG4000	1
L-24	1
S-80	1.5
EG-3/75GE	5

		PF87	PF91	PF93	PF81	PF94 (standby)	PF95(standby)
Sulfur meter test	ML	0.71	0.66	0.65	0.67	0.72	0.79
	MH	7.46	9.1	8.83	8.17	7.74	8.6
	TS2 sec	52	48	34	41	55	27
	TC90 sec	172	122	114	97	177	107
Basic physical property test	Hardness shoreA	59	63	59	59	59	60
	M100 MPa	2.55	3.69	2.38	2.25	1.79	3.14
	Tensile strength MPa	15.87	10.99	10.85	7.9	16.96	12.79
	Elongation %	667	433	576	550	677	598
	Gravity g/cm^3	1.265	1.275	1.302	1.267	1.283	1.27
	Hardness shoreA	63	65	61	62	62	63
Heat resistant air aging 100℃×70h	M100 MPa	4.00	2.00	2.00	3.00	3.00	3.00
	Tensile strength MPa	13.86	11.98	11.06	7.69	11.34	13.01
	Rate of change of tensile strength %	-12.67	9.01	1.94	-2.66	-33.14	1.72
	Elongation%	519.00	302.00	490.00	442.00	538.00	457.00
	Rate of change of elongation at break %	-22.19	-30.25	-14.93	-19.64	-20.53	-23.58
compression set 100℃×24h	deformation rate %	46.67	23.33	20.00	33.33	46.67	16.13
surface resistivity Ω		7.52×10^{14}	4.73×10^{14}	2.17×10^{15}	9.10×10^{14}	7.66×10^{14}	1.23×10^{15}
volume resistivity Ω.cm		7.28×10^{15}	1.01×10^{15}	2.16×10^{15}	2.22×10^{15}	1.66×10^{15}	2.02×10^{15}

Functional reinforcement materials GreenThinking®PF series- NBR sulfur system

	Material	Phr
Recipe/formula	NBR3350	100
	Functional filler	60
	135	20
	ZNO	6
	STA	1
	FL	1
	985P	1
	9332F	1
	KY445	1
	MC-2	0.5
	DPTT	0.8
	CZ	1
	NOBS	0.7
	TMTD	0.8
		194.8

			PF87	PF81	PF91	PF93	PF94 (standby)	PF95(standby)
Sulfur meter test	ML		0.78	0.82	0.83	1.05	0.79	1.12
	MH		9.78	11.13	14.02	12.96	9.11	13.15
	TS2 sec		59	77	66	73	66	73
	TC10 sec		53	67	62	67	55	66
	TC90 sec		111	151	134	146	116	146
Basic physical property test	Hardness shoreA		67	67	68	68	67	69
	M100 Mpa		3.98	2.83	3.74	3.81	4.36	3.9
	Tensile strength MPa		18.44	13.34	15.27	14.91	20.32	16.06
	Elongation %		698	710	596	664	689	676
	Gravity g/cm^3		1.32	1.34	1.341	1.363	1.333	1.332
Heat resistant air aging 120℃×24h	Hardness shoreA		72	67	70	70	70	70
	Change of hardness shoreA		5.00	0.00	2.00	2.00	3.00	1.00
	Tensile strength MPa		16.69	11.87	12.16	12.8	17.09	13.77
	Rate of change of tensile strength %		-9.49	-11.02	-20.37	-14.15	-15.90	-14.26
	Elongation%		558	661	423	575	581	575
	Rate of change of elongation at break %		-20.06	-6.90	-29.03	-13.40	-15.67	-14.94
compression set 100℃×24h	deformation rate %		17.24	13.79	10.34	10.34	16.24	10.34
surface resistivity Ω			7.65×10^{12}	5.78×10^{12}	1.14×10^{14}	6.57×10^{12}	6.78×10^{12}	1.34×10^{13}
volume resistivity Ω.cm			8.24×10^{11}	6.10×10^{11}	5.09×10^{11}	5.88×10^{11}	6.97×10^{11}	4.06×10^{11}

Functional reinforcement materials GreenThinking®PF series- NBR peroxide system

Material	Phr
NBR3340	100
PPT silica PT702	20
Functional filler	60
Indirect zinc oxide process	5
stearic acid	1
Antiager KY445	1
Additive 1900	1
release agent 985P	1
Filler dispersant FL	1
Stabilizer PEG4000	1
dicumyl peroxide DCP-40C	4.5
assistant crosslinker PL400/70	0.5
	196

		PF93	PF87	PF81	PF95（Standby
Sulfur meter test	ML	1.04	0.76	1.21	1.06
	MH	20.64	14.27	20.37	20.79
	TS2 sec	31	45	31	31
	TC10 sec	31	39	28	30
	TC90 sec	125	188	122	120
Basic physical property test	Hardness shore A	80	74	78	80
	M100 Mpa	9.02	4.3	4.73	8.92
	Tensile strength MPa	14.48	13.67	8.55	15.35
	Elongation %	215	468	283	201
	Gravity g/cm^3	1.358	1.35	1.345	1.357
Heat resistant air aging 120℃×70h	Hardness shore A	84	82	84	84
	Change of hardness shore A	4	8	6	4
	Tensile strength MPa	15.92	11.04	8.69	16.44
	Rate of change of tensile strength %	9.94	-19.24	1.64	7.10
	Elongation%	153	223	189	149
	Rate of change of tensile strength %	-28.84	-52.35	-33.22	-25.87
compression set 100℃×24h	deformation rate %	7.81	21.88	18.18	6.25
surface resistivity Ω		7.3×10^{13}	1.06×10^{14}	7.01×10^{13}	3.66×10^{14}
volume resistivity Ω.cm		8.05×10^{10}	5.60×10^{12}	3.84×10^{12}	3.72×10^{12}

Looking Forward to Cooperate

共赢精进！

Better Together