

Rubber Functional Additives

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Rubber Heat-resistant Adhesive LG-80

Compositions:

LG-80 agent consists of molecule of reactive hydrocarbons, Nano-silicon dioxide, boron complex and anti-aging new materials. The agent is a new multi-functional material which produced by in-situ composite, weak bond suspended, active coated and diameter expanding of particle technologies.

Properties:

It is non-toxic, harmless to human and no environmental pollution.

Item	Specification	Test Method
Appearance	light grey powder	visual inspection
Heating loss (105°CX2h) ,%	≤2.0	HG/T3065
Ignition loss (800°CX2h),%	≤15.0	HG/T3066
pH Value	8.0~10.5	HG/T3067

Advantages:

1. It can improve the adhesion force: In the steel tires, semi-steel tires and engineering tire, the Nano-silicon dioxide, Boron Compounds and molecule of reactive hydrocarbons will be involved in adhesion reaction, which can improve the adhesion between rubber and steel cord, polyester, nylon and other framework materials, meanwhile, the adhesion after aging also can be improved significantly.
2. It can reduce the porosity and improve the compactness of rubber. This new material can effectively capture and consume heating expansion of small molecules under pressure, so it can reduce the porosity, and improve the compactness of the rubber with filling nanomaterial's gap. Meanwhile, it also can improve the heat resistance and fatigue resistance of final vulcanized rubber products.
3. It has excellent technologies. The new material has interfacial activity component, which can reduce the interfacial energy among all materials in formula. This will stabilize the dimension of rubber sheet and tires, and products surface will be smoother.

Usage and Dosage:

- 1) Add LG-80 agent together with Zinc Oxide when mixing rubber master-batch.
- 2) 6~8 phr of total tire compound can be used for tire carcass, rubber sheet, rubber belt, and tire transition layer.
- 3) More than 15 phr can be used for inner-liner application.

Packing and Storage:

It is packed in Kraft paper bags lined with plastic film, net weight is 25kg/bag.

It should be stored in a cool, dry warehouse.

The shelf life is 36 months.

Rubber Reinforcing Adhesive RF-1

Compositions:

RF-1 is a functional auxiliary agent, which is produced by Reactive hydrocarbon molecules, Nano silicon dioxide, Boron compounds and Anti-aging new materials.

The production technology contains in-situ synthesis, weak bond suspended, active coated and diameter expanding.

Properties:

It is non-toxic, harmless to human and no environmental pollution.

Item	Specification	Test Method
Appearance	Silver grey granular	visual inspection
Heating loss (105°CX2h) ,%	≤2.0	HG/T3065
Ignition loss (800°CX2h),%	≤15.0	HG/T3066
pH Value	8.0±1.5	HG/T3067

Advantages:

RF-1 can effectively improve adhesive force and aging resistance, and solve the problem of porosity, unstable dimension of tires. Reduce the quality problem of tire delaminating and tire shoulder empty, improve tire durable performance, thus extend the life time and driving safety of tires.

4. RF-1 can improve the adhesive force.

When RF-1 is used in all-steel tires, semi-steel tire and engineering tire, RF-1 can significantly improve the adhesion between rubber and steel cord, polyester, nylon and other framework materials.

5. RF-1 can reduce the porosity and improve compactness.

RF-1 can effectively capture and consume micromolecule of semi-finished products, then reduce the porosity, and improve the compactness of rubber mater-batch though filling nano materials.

Meanwhile, RF-1 also can improve heat resistance and fatigue resistance of vulcanized rubber.

6. RF-1 has interfacial activity, it can reduce the interfacial energy, which can stabilize dimension of rubber tread and rubber sheet, and surface of products would be smooth.

Usage and Dosage:

- RF-1 apply to natural rubber (NR) and synthetic rubber (SR), mainly used for all-steel tires and semi-steel tires.
- Add RF-1 together with Zinc Oxide when mixing the rubber mater-batch.
- 6-8 phr used for the formulation of tire carcass, tire film, tire belted layer and tire transition layer.
- 15phr can be used in tire inner liner formulation to replace other filler, and/or make small adjustment based on the vulcanizing rate.
- 6phr used for the formulation of tire tread and tires sidewall.

Packing and Storage:

- RF-1 is packed in PP woven bag lined with PE film. Net weight is 25kg/bag.
- RF-1 should be stored in a dry, clean, cool warehouse. The shelf life is 36 months.

Low Thermogenesis & Abrasion Resistant Agent LG-1520

Compositions:

LG-1520 agent consists of Nano-short fiber, Nano-gas phase silicon oxide and boron complex. The agent is a kind of new multi-functional material which produced by in-situ composite, weak bond suspended, active coated and diameter expanding of particle technologies.

Properties:

It is non-toxic, harmless to human and no environmental pollution.

Item	Specification	Test Method
Appearance	light grey powder	visual inspection
Heating loss (105°CX2h) ,%	≤2.0	HG/T3065
Ignition loss (800°CX2h),%	≤20.0	HG/T3066
pH Value	8.0~10.5	HG/T3067

Advantages:

1. It can reduce the porosity and improve the abrasion-resistance of rubber, then improve the compactness and abrasion-resistance of vulcanized rubber products.
2. This new material can reduce the thermogenesis of vulcanized rubber by 5% to 10%, and significantly improve the fatigue resistance of rubber.
3. It has excellent technologies. The new material has interfacial activity component, which can reduce the interfacial energy among all materials in formula. This will stabilize the dimension of rubber sheet and tires, and products surface will be smoother.

Usage and Dosage:

- 1) Add LG-1520 agent together with Zinc Oxide when mixing rubber master-batch.
- 2) 3~6 phr can be used for tire tread and sidewall, other formula is same as before or make slightly adjustment based on vulcanized speed.
- 3) For conveyer belt, please refer to the tire application.

Packing and Storage:

It is packed in Kraft paper bags lined with plastic film, net weight is 25kg/bag.

It should be stored in a cool, dry warehouse.

The shelf life is 24 months.

Rubber Tear Resistance Agent K-203

Compositions:

K-203 agent consists of Nano-short fiber, Nano-gas phase silicon oxide, boron complex and surfactant. The agent is a kind of new multi-functional material which produced by in-situ composite, weak bond suspended, active coated, diameter expanding of particle and step reaction technologies.

Properties:

It is non-toxic, harmless to human and no environmental pollution.

Item	Specification	Test Method
Appearance	light grey powder	visual inspection
Heating loss (105°CX2h) ,%	≤2.0	HG/T3065
Ignition loss (800°CX2h),%	≤20.0	HG/T3066
pH Value	8.0~10.5	HG/T3067

Advantages:

1. K-203 new material can significantly improve tear resistance of tires and reduce customers' complaints.
2. K-203 can reduce the porosity, improve the compactness of rubber and stabilize the dimension. So, it can improve the compactness and abrasion resistance of final products.
3. K-203 has excellent technologies. The new material has interfacial activity component, which can reduce the interfacial energy among all materials in formula. This will stabilize the dimension of rubber sheet and tires, and products surface will be smoother.

Usage and Dosage:

- 1) Add K-203 agent together with Zinc Oxide when mixing rubber master-batch.
- 2) 3~5phr of total tire compound can be used for tire tread, rubber core, and other formula is same as before or make slightly adjustment.

Packing and Storage:

It is packed in Kraft paper bags lined with plastic film, net weight is 25kg/bag.

It should be stored in a cool, dry warehouse.

The shelf life is 24 months.

Ice & snow Resistant Agent D-6080

Application:

D-6080 agent can be used as additive agent in natural rubber and synthetic rubber for high performance tires such as steel snow tires, semi-steel snow tire.

Compositions:

D-6080 agent consists of high polymer elastomer, special properties of carbon and interfacial agent with polar group. The D-6080 is a low-temperature resistance functional new material which produced by a special technology called Activated Grafting Polymerization.

Properties:

It is non-toxic, harmless to human and no environmental pollution.

Item	Specification	Test Method
Appearance	grey powder	visual inspection
Heating loss (105°CX2h) ,%	≤2.0	GB/T3780.7-2006
pH Value	6.0~9.0	GB/T3780.8-2008

Advantages:

1. D-6080 agent contains various functional groups, which can reduce the hardenability of rubber products at low temperatures. It not only can improve the compatibility between rubber and filler, but also can improve the compatibility between itself and fillers in rubber.
Applied the new material in tire, the hardness of tire tread will be lower at low temperatures, so that tires tread will contact with smooth ice surface more closer, then lead to greater friction between tires and road. This will improve the safety of cars on the smooth ice surface, and reduce the tire crack in winter.
2. D-6080 agent has excellent technologies. The new material can effectively capture and consume heating expansion of small molecules under pressure, so it can reduce the porosity, and avoid bubbles.
3. D-6080 agent has interfacial activity component, which can reduce the interfacial energy among all materials in formula. This will stabilize the dimension of rubber sheet and tires, and products surface will be smoother of semi-finished product.

Usage and Dosage:

- 1) Add D-6080 agent together with Zinc Oxide when mixing rubber master-batch.
- 2) 5~7 phr of total tire compound can be used for tire tread, or carbon black can be reduced to maintain the rubber content.

Packing and Storage:

It is packed in Kraft paper bags lined with plastic film, net weight is 25kg/bag.

It should be stored in a cool, dry warehouse.

The shelf life is 24 months.

Rubber Release & Brightening Agent L-810

Compositions:

L-810 agent consists of special ester of fatty acid and interfacial agent.

Properties:

It is non-toxic, harmless to human and no environmental pollution.

Item	Specification	Test Method
Appearance	white granular	visual inspection
Heating loss (105°CX2h) ,%	≤2.5	GB/T11409
Ignition loss (800°CX2h),%	≤38.0	GB/T11409
pH Value	6.5~9.5	GB/T19281

Advantages:

1. It will improve the brightness and smoothness of tire and conveyer belts appearance.
2. It will improve fluidity and lubricity of tire surface, external spraying agent can be replaced totally. It also can avoid bubble, lack of rubber and double rubber layer caused by poor fluidity of rubber.
3. It also can be used as release agent.

Usage and Dosage:

- 1) Add L-810 agent together with Zinc Oxide when mixing rubber master-batch.
- 2) 2~3 phr of total tire compound can be used for tire tread and tire sidewall.
This material will not affect the physical, mechanical and vulcanization properties of rubber product, so the dosage can be adjusted based on the vulcanization speed.
- 3) It should be same application for conveyer belt.

Packing and Storage:

It is packed in Kraft paper bags lined with plastic film, net weight is 25kg/bag.

It should be stored in a cool, dry warehouse.

The shelf life is 24 months.

Rubber Antifatigue Agent LG-768

Compositions:

LG-768 agent consists of Non-metallic complex, Carbohydrate, Three-dimensional fiber grafted polymer, Non-metallic oxide and interfacial adhesive agent. The agent is a long-acting adhesion functional new material which produced by special technology.

Properties:

It is non-toxic, harmless to human and no environmental pollution.

Item	Specification	Test Method
Appearance	taupe particles	visual inspection
Heating loss (105°CX2h) ,%	≤2.0	HG/T3065
Ignition loss (800°CX2h),%	≤25.0	HG/T3066
pH Value	6.5~9.5	HG/T3067

Advantages:

1. It can improve the ageing-resistance and fatigue-resistance.
The hindered phenol structure formed between phenolic hydroxyl group and methoxyl group on the molecule, which can capture and consume the free radical in rubber to terminate the chain reaction. Therefore, it can improve the ageing-resistance and fatigue-resistance of high polymer material such as rubber.
2. It can improve adhesive performance.
3. It has excellent technologies. The new material has interfacial activity component, which can reduce the interfacial energy among all materials in formula. This will stabilize the dimension of rubber sheet and tires, and products surface will be smoother.

Usage and Dosage:

- 1) Add LG-768 agent together with Zinc Oxide when mixing rubber master-batch.
- 2) 3~8 phr of total tire compound can be used for tire carcass, rubber sheet, rubber belt, and tire transition layer, other formula is same as before or make slightly adjustment.

Packing and Storage:

It is packed in Kraft paper bags lined with plastic film, net weight is 25kg/bag.

It should be stored in a cool, dry warehouse.

The shelf life is 36 months.

Rubber Antioxidant & Adhesion agent F-2818

Compositions:

F-2818 agent consists of antioxidant new material, triaxial-fiber grafted polymer, low molecular polymer with the hydroxyl and carboxyl, nonmetallic oxides and interface bonding material. The agent is a new functional auxiliary produced by in-situ and step reaction technologies. It can increase adhesion and anti-ageing property of rubber products.

Properties:

It is non-toxic, harmless to human and no environmental pollution.

Item	Specification	Test Method
Appearance	Taupe powder	visual inspection
Heating loss (105°CX2h) ,%	≤2.5	HG/T3065
Ignition loss (800°CX2h),%	≤20.0	HG/T3066
pH Value	7.0~10.0	HG/T3067

Advantages:

1. Due to F-2818 contains phenolic hydroxyl group and methoxy group, there will be form a hindered phenol structure between the two group, the hindered phenol structure can capture and consume free radical in rubber system, then terminate the chain reaction, therefore F-2818 can improve ageing resistance and fatigue resistance of rubber products.
2. Bonding material in F-2818 is very easy to permeate and diffuse to bonded materials and surface of framework material. After crosslinking and chemical reaction of the bonding materials, thereby form physical and chemical bonding on the bonding interface.
3. Comparative experiments show that F-2818 agent can significantly improve the adhesion force between rubber and steel cord, nylon and polyester fiber.
4. F-2818 is widely used for medium-high grade tire carcass and sidewall formulation, it can improve the durability and safety of tire.

Usage and Dosage:

1. Add F-2818 agent together with Zinc Oxide to internal mixer when mixing rubber mater-batch.
2. 3-5 phr for tire carcass and sidewall formulation, other materials is constant, or 6phr instead of 3phr high dispersive silica.

Packing and Storage:

It is packed in Kraft paper bags lined with plastic film, net weight is 25kg/bag.

It should be stored in a cool, dry warehouse.

The shelf life is 24 months.

Rubber High-efficiency Abrasion Resistance Agent M-1

Application:

M-1 agent mainly used in tire, conveyor belt and rubber hose production.

Compositions:

M-1 agent is Rubber Short Fibers, which is a new functional auxiliary agent, and developed by Nano material as carrier and contains multifunctional groups.

Properties:

It is non-toxic, harmless to human and no environmental pollution.

Executive standard: Q/0205XYJ003-2015

Item	Specification	Test Method
Appearance	White superfine powder	visual inspection
Heating loss (105°C X2h) ,%	≤1.0	GB/T3185
Ignition loss (800°C X2h),%	≤50.0	GB/T3185
Oil-absorbed Value (ml/100g), %	50±20	HG/T2567
pH Value	8.5-10.5	HG/T2567
Sieve residue (150 μ m), %	≤1.0	HG/T2567

Advantages:

7. For the formulation of radial tire tread and OTR tread, M-1 agent can be added directly, which can significantly improve the performance of Abrasion Resistance, cut-resistance and stung resistance, also can improve processing property of semi-finished product, improve appearance and service life of tire.
8. Add M-1 agent together with carbon black, it is easy to disperse and less energy consumption during milling, rubber compound has good autohesion.
It would be very smooth when semi-finished products extruded, and keep stable dimension, the tire surface is solid, shining and very beautiful after vulcanization.
It can improve flexible performance, tear resistance and abrasion resistance of rubber compound, and improve aging resistant performance of sulfide products.

Usage and Dosage:

- 9) 3-8 phr for tire production.
- 10) Add M-1 agent directly on the basis of original formulation or can make a slightly change. Optimize the vulcanization rate based on the experimental data and results.
- 11) Above all are suggestions, you can adjust for best performance by yourself.

Packing and Storage:

It is packed in Kraft paper bags lined with plastic film, net weight is 25kg/bag.

It should be stored in a cool, dry warehouse.

The shelf life is 24 months.