# Global professional green rubber additives solution provider

FIRST

FIRST Technology


福斯特




## Main businesses

R&D, production and sales of rubber pre-dispersed masterbatch, rubber dispersant, rubber masterbatch and elastomer alloy.

## Quality policy

Quality first
Customer first
Continuous improvement
Common development

## Service tenet

Resources are limited. but the services are unlimited.

# About us

FIRST Rubber & Plastic Technology Co., Ltd. is headquartered in Dongguan, Guangdong Province, and has two production bases: Dongguan FIRST Rubber & Plastic Technology Co., Ltd. and Nanjing FIRST Technology Co., Ltd. Since 2007, the company has a development history of nearly 20 years. It is a leading enterprise that integrates the R&D, production and sales of rubber additives (including vulcanizing agents, accelerators, activators, anti-scorchers and antioxidants), pre-dispersed master batches, dispersants, rubber masterbatch and elastomer alloys. The company has established R&D centers in Dongguan and Nanjing successively, with abundant R&D expertise, perfect experimental equipment and testing instruments, advanced production equipment and excellent sales and customer service team, and established and maintained long-term and stable cooperative relations with well-known universities, scientific research units and rubber and plastic products enterprises at home and abroad.

The company has passed ISO9001:2015 quality management system certification and IATF16949:2016 quality management certification system, with an annual production capacity of more than 30,000 tons. The products meet the requirements of environmental protection laws and regulations such as ROHS, PAHS and REACH SVHC, and are widely used in various rubber products such as tires, shoes, balls, sports equipment, thermal insulation materials, cots, hoses, tapes, wires and cables, auto parts, etc.

With the quality policy of "quality first, customer first, continuous improvement and common development" and the service tenet of "limited resources and unlimited services", the company is grateful to customers, returns to society, devotes itself to and deeply cultivates the rubber additives industry, and contributes to the green and environmental protection of the rubber industry!

# QUALIFICATIONS AND HONORS


High-tech enterprises in Guangdong Province


High-tech enterprises in Jiangsu Province


Jiangsu Province AAA-level


Private scientific and technological enterprises in Jiangsu Province


FIRST & Shenyang University of Chemical Technology


FIRST & Qingdao University of Science and Technology


FIRST & Xuzhou Industrial Vocational and Technical College



## Innovation and Development

Innovation is the fundamental driving force for the development of enterprises. Taking the development path of independent innovation and continuous innovation will stimulate the enthusiasm of enterprises for independent innovation and improve their technological innovation ability. Since its establishment, FIRST has been adhering to the quality policy of "quality first, customer first, continuous improvement and common development" and taking "limited resources and unlimited services" as its service purpose, constantly innovating and developing, and enhancing the core competitiveness of the enterprise.

## ISO9001: 2015　IATF16949: 2016

FIRST's raw materials and finished products are inspected in strict accordance with international, national, industrial and enterprise standards. Through the effective application of the quality system, the company can continuously improve its products and production processes to realize the stability and improvement of product quality.


CRAFTSMANSHIP MANUFACTURING

# Craftsmanship with 20 years of sharpening swords



INNOVATIVE DEVELOPMENT

## Innovation, the core driving force of development

High cost performance
High dispersion technology
Continuous filtration technology
Homogeneous stability
One-stop supply

**Pre-dispersion Rubber master batch** & **Dispersant**

Quickly reduce Mooney
Do not change hardness
Do not affect the sulfur rate.
High fluidity
No frost emission and whitening
Rapid extrusion and demoulding

### Conduct "production, learning and research" cooperation with universities and scientific research institutes to ensure the leading edge of product performance.

1. The combination of "production, learning and research" provides technical support for new product development, customer demand, quality improvement and upgrading.

2. Many years' transformation technology of pre-dispersed rubber masterbatch for powder, liquid and solid raw materials.

3. Solutions for dust-free, low energy consumption, easy weighing and environmentally friendly production.

4. The application of special masterbatch carrier can improve the diffusion speed and dispersion of products.

5. Provide personalized product development and services according to customer needs.

QUALITY IS A RESPONSIBILITY

## Quality is a responsibility. FIRST always insists on it.

Quality is the life of an enterprise, and quality innovation is the driving force to support its rapid growth and undertaking of social responsibility, while product quality is the foundation and basic guarantee for its development. FIRST has passed ISO9001:2015 and IATF16949：2016 quality management systems on the road of independent innovation. Most products have passed the environmental requirements such as ROHS, PAHS, REACH SVHC, etc. and combined positive quality pushing with reverse quality driving, which is interlocked and closed-loop controlled, pursuing perfection.




## CRAFTSMANSHIP MANUFACTURING

### Provide personalized product development and services

Make full use of the manpower, material resources and financial resources of technology development, realize the combination of basic research and applied research, product design and process design, soft technology and hard technology, continuously improve product quality and improve high-level technical service centers. Provide personalized product development and services according to customer requirements.

### Improve the supporting testing equipment and testing means.

Strictly abide by industry standards, observe strict technological process and operation specifications, be meticulous, and keep improving. Always put customers first, always take customer satisfaction as the pursuit of target, improve customer satisfaction and expand the brand effect of the company. Respect science, innovate management, promote the mutual dependence of various businesses, steadily advance and develop in scale, to realize the continuity and durability of the company’ s development.

### Provide technical support and services (Nanjing and Dongguan Technical Centers)

We will continuously develop new products, new processes and new technologies with market prospects and competitiveness, actively digest, absorb and innovate imported technologies, make full use of the world's advanced technological achievements for comprehensive integration and application development, and form leading products and core technologies with independent intellectual property rights.

### Self-delivery logistics in Pearl River Delta and Yangtze River Delta

There are stocking warehouses and full-time service personnel in Vietnam, Wenzhou, Chongqing, Chengdu and Fujian.
Other regional delivery companies cooperate with large logistics companies to deliver products and goods to customers' warehouses quickly and on time by sea, land and air.
There are many offices at home and abroad, which are responsible for product sales and after-sales service in various regions and countries, and are supported by professional technical service teams to meet the needs of our customers for related technologies and other services.

# CONTENTS

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## Thiazole

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® MBT(M)-75 MBT(M)-80 |  | 2-mercaptoben zothiazole | EPDM/ SBR | General accelerator for natural rubber and synthetic rubber. Fast vulcanization speed, low vulcanization temperature (125 ℃ ), wide vulcanization flatness, no sulfur, low sulfur vulcanization system and chloroprene rubber as anti-coking agent and vulcanization delay agent respectively, which have the functions of plasticizing and softening raw rubber. |
| First® ZMBT(MZ)-75 ZMBT(MZ)-80 |  | 2-mercaptoben zothiazole zinc salt | EPDM/ SBR | High-speed vulcanization accelerator for natural rubber and synthetic rubber. Without dyeability of rubber, MZ has the same properties as M, and the critical temperature of vulcanization is 138 ℃ , with excellent resistance to scorch, safe operation, difficult early vulcanization and wide vulcanization flatness. |
| First® MBTS(DM)-75 MBTS(DM)-80 |  | Dibenzothiazyl disulfide | EPDM/ SBR | General accelerator for natural rubber, synthetic rubber and reclaimed rubber. Good flatness, moderate vulcanization speed, relatively high critical vulcanization temperature, with obvious after-effect, and without early vulcanization, safe in operation. |
| First® MDB-75 MDB-80 |  | 2-(4-morpholinyl dithio) benzothiazole | EPDM/ SBR | After-effect accelerators and vulcanizing agents in natural rubber and synthetic rubber. When used as an accelerator, its performance in NR and SBR is similar to CZ, and when used as a vulcanizing agent, it is similar to TMTD, but it has good resistance to scorch. Sulfurization is slow when used alone, so a small amount of thiuram or dithiocarbamates accelerators shall be added. |

## Guanidine

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® DPG(D)-80 |  | Dipheny lguanidine | EPDM/SBR | The medium-speed accelerator commonly used for natural rubber and synthetic rubber has no vulcanization promotion effect on IIR and EPDM, and plays the role of plasticizing and peptizing agent in CR; when the critical vulcanization temperature is 141 ℃ , the vulcanization flatness is poor, the vulcanization speed is slow, and the safety of rubber compound is good. The aging resistance of its vulcanizate alone is poor, so it is necessary to add antioxidant. Commonly used as thiazole, hypoxanthamide and thiuram activators, and it can be used for continuous vulcanization when combined with DM and TMTD. |
| First® DOTG-75 |  | Di-o-toluene guanidine | EPDM/ SBR AEM | Activators and accelerators for natural rubber and synthetic rubber; very similar to D (diphenylguanidine); the activity is very low at the operating temperature, and the operation is safe; the critical vulcanization temperature is 141 ℃ , which is very active at the vulcanization temperature, especially when it is higher than the critical temperature, and the vulcanization flatness is good. It can be an important activator of thiazole, thiuram and sulfenamide accelerators, and has the effect of super-accelerator when used together with accelerator M; it is often used with HMDC in vulcanization systems such as acrylate and polyurethane. |

## Sulfonamides

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® TBBS(NS)-75 TBBS(NS)-80 |  | N- tert-butyl -2-benzothiazole sulfenamide | EPDM/SBR | After-effect accelerators for natural rubber, synthetic rubber and reclaimed rubber. Especially suitable for carbon black compound with strong alkalinity; safe at operating temperature, strong resistance to scorch, fast vulcanization speed and high tensile strength, which can increase the use ratio of synthetic rubber; it does not produce nitrosamine carcinogen during vulcanization, and is an ideal substitute for NOBS. It has excellent comprehensive properties and is called standard accelerator. It can be used with thiuram, guanidine and aldehyde amine accelerators to improve activity, and when used with anti-coking agent PVI, it forms a good vulcanization system; |
| First® CBS(CZ)-80 |  | N- cyclohexyl -2-benzothiazole sulfenamide | EPDM/SBR | Common after-effect accelerators for natural rubber and synthetic rubber. Excellent resistance to scorch, safe processing operation and fast vulcanization speed, especially suitable for oil furnace carbon black compound with high alkalinity. In synthetic rubber, it is often combined with other accelerators, such as TMTM, TMTD, PZ, DPG or other alkaline accelerators, and can also be activated by M and DM, which can effectively improve the tensile stress and tensile strength of vulcanized rubber, with slight discoloration, no frost, and good mechanical properties and aging resistance. |
| First® NOBS-80 |  | N-oxydiethylene -2-benzothiazole sulfenamide | EPDM/SBR | Suitable for synthetic rubber such as natural rubber, styrene-butadiene rubber and cis-butadiene rubber; as an after-effect vulcanization accelerator, it has the advantages of low activity, long delay, short vulcanization time, excellent resistance to scorch, safe processing and no frost spraying. It is commonly used in tire products, so it is usually replaced by TBBS(NS) for environmental protection. |
| First® OTOS-80 |  | N-oxydiethylene thiocarbamoyl -N'-oxydiethylene sulfenamide | EPDM/SBR | Delayed main accelerators for general rubber such as NR, SBR, NBR and EPDM; the delay effect and processing safety are better than those of other benzothiazole and sulfenamide accelerators such as accelerators M and DM. Suitable for high temperature vulcanization, the critical temperature of vulcanization is 149℃ , and the activity is great beyond this temperature; when natural rubber is vulcanized at high temperature, it has good reduction resistance, high heat resistance and small compression deformation. |
| First® DCBS(DZ)-80 |  | N,N-dicyclohexyl -2-benzothiazole sulfenamide | EPDM/SBR | Sulfenamide accelerators for natural rubber and synthetic rubber; compared with CBS, DCBS has longer resistance to scorch, large molecular weight, stable structure, difficult decomposition at room temperature, less pollution and low odor. Vulcanized products have excellent bonding characteristics with metals (such as brass). |
| First® TBSI-75 |  | N- tert-butyl-bis (2-benzothiazole) sulfimide | EPDM/SBR | The after-effect environmental accelerator of natural rubber and synthetic rubber is especially suitable for carbon black rubber compound with strong alkalinity, which has strong resistance to scorch, high safety at operating temperature, fast vulcanization speed and good reduction resistance. It can replace TBBS+PVI system for large natural rubber thick products, with high molecular weight, high melting point, good thermal stability and stability in water, and can improve the heat resistance and durability of adhesion between steel wire and rubber compound. |
| First® CCBS-80 |  | N- cyclohexyl-bis (2-thiobenzothiazole) sulfimide | EPDM/SBR | Environmental protection accelerator widely used in tires and other rubber products does not produce N- nitrosamine carcinogens, and partially replaces NS, which effectively prevents scorching of rubber compound, reduces heat generation of products, reduces the loss of tread extrusion production, and improves environmental problems in the production process. |



## Thiuram

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® TMTM(TS)-80 |  | Tetramethyl thiuram monosulfide | EPDM | Used as overspeed vulcanization accelerator in natural and synthetic rubbers. The critical temperature of vulcanization is about 121℃ , the vulcanization activity is about 10% lower than TMTD, the scorch safety is sound, and it also has excellent aging resistance in low sulfur vulcanized products. It can be used alone, guanidine, aldehyde amine can increase its activity, usually used as the second accelerator of thiazole and sulfenamide; it can be used as an anti-scorch delay agent for non-sulfur modified chloroprene rubber (CR). |
| First® TMTD(TT)-75 TMTD(TT)-80 |  | Tetramethylthiuram disulfide | EPDM | Used as overspeed vulcanization accelerator in natural and synthetic rubbers. The effective sulfur content is about 9.98%, which can be used as vulcanizing agent in low sulfur vulcanization system and EV system. The critical temperature of vulcanization is 100 ℃ , and it is often used with CTP as a main and an activating accelerator in sulfur-cured diene rubber such as NR, SBR, IR, BR and NBR to improve the scorch safety of rubber compound. As a primary accelerator, it needs to be combined with zinc oxide and stearic acid, and it is often used as a secondary accelerator of thiazoles, and can also be combined with other accelerators to be used in continuous vulcanization systems. It is a scorch retarder for non-sulfur modified chloroprene rubber (CR). |
| First® TBzTD-70 TBzTD-75 |  | Tetrabenzyl thiuram disulfide | EPDM | Rapid vulcanization accelerator and sulfur carrier in natural rubber and synthetic rubber. It is mainly used to replace TMTD, and will not produce or release carcinogenic nitrosamine compounds during vulcanization, which meets the requirements of German "Technical Rules for Hazardous Substances" TRGS552 on nitrosamine toxicity. TBzTD-75GE has a longer scorch time than TMTD-75GE. Sometimes it is also used as vulcanization inhibitor for PVC rubber; TBzTD-75GE can be used as a retarder together with ETU-75GE for thiol-regulated chloroprene rubber compound. |
| First® TETD-75 |  | Tetraethyl thiuram disulfide | EPDM | Used as overspeed vulcanization accelerator in natural and synthetic rubbers. TETD has better scorch safety than TMTD and is widely used in rubber injection molding products. It is often used as an activating accelerator of thiazole, guanidine and aldehyde amine accelerators; the effective sulfur content is about 8.25%, which can be used as vulcanizing agent in sulfur vulcanization system; TETD combined with TMTD can reduce frosting and maintain normal vulcanization activity. |
| First® TBTD-50 |  | Tetrabutyl thiuram disulfide | EPDM | Used as overspeed vulcanization accelerator in natural and synthetic rubbers; the optimum vulcanization temperature is 95-110 ℃ , which has high solubility in rubber. TMTD combined with it can reduce frosting and maintain normal vulcanization activity. The effective sulfur content of TBTD is about 7.5%, so it can be used as vulcanizing agent in sulfur vulcanization system. |
| First® TiBTD-75 |  | Tetraisobutyl thiuram disulfide | EPDM | It is an overspeed accelerator suitable for NR, IR, BR, SBR, IIIR, NBR and EPDM; it does not have rubber dyeability, which is easy to weigh, easy to disperse and pollution-free; the performance is similar to TT and TETD, and nitrosamines are not produced during vulcanization; good vulcanization performance and low strength. Without sulfur, it also has high vulcanization, heat resistance and no foaming, and the product has strong pressure resistance. |

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® DPTT(TRA)-70<br>DPTT(TRA)-75 |  | Tetra (VI) Sulfide Bispentamethylene thiuram | EPDM | Natural rubber, overspeed accelerator of synthetic rubber, vulcanizing agent. It can be used as the main accelerator in CSM, SBR and IIR; the effective sulfur content is 18.75%. When it is used as vulcanizing agent, it is safe at operating temperature, and the vulcanizate has excellent heat resistance and aging resistance. When used with thiazole accelerators, it is especially suitable for nitrile rubber, and the vulcanizate has excellent compression deformation and heat resistance; compared with other thiuram accelerators, it shows better processing safety and higher crosslinking density, reduces sulfide reduction and improves thermal stability. |
| First®<br>DDTS-75<br>DDTS-80 |  | Dithiodimethyl diphenyl thiuram | EPDM | This product, also known as MPTD, is a delayed accelerator, suitable for IR, hundreds of people, IR, BR, NBR, etc. Mainly used as the second accelerator with TMTD,TMTM or zinc dithiocarbamate to improve the processing safety of rubber compound. No pollution, no discoloration and easy dispersion. Suitable for light or bright products. |

## Thioureas

| 商品名 | 外观 | 化学成分 | 聚合物载体 | 特性与应用 |
|---|---|---|---|---|
| First®<br>ETU(NA-22)-75<br>ETU(NA-22)-80 |  | 1,2- ethylidene thiourea (ethylenethiourea) | EPDM/SBR | Universal accelerator for halogen rubber products such as CR, CSM and CPE. In the vulcanization system of non-sulfur modified chloroprene rubber, zinc oxide and magnesium oxide are generally used as vulcanizing agents and compounded with this product, which has better vulcanization performance; low sulfur or sulfur-free vulcanization of other diene rubbers can be used as activator and auxiliary accelerator. |
| First®<br>DETU-75 |  | Diethylthiourea | EPDM/SBR | It has a unique effect on the vulcanization of chloroprene rubber, and its products have small compression permanent deformation and good aging resistance; in the vulcanization system of non-sulfur modified chloroprene rubber, it is generally better to use it with zinc oxide and magnesium oxide. It is also an accelerator for butyl rubber and a vulcanizing activator for EPDM. It has antioxidant effect on NR, CR, NBR and SBR; it can be activated by ZDC and salicylic acid, but DM and TMTD can inhibit its activity. Thiazole and sulfenamide accelerators can be activated in NR and SBR, and can be vulcanized at high temperature and high speed when the dosage is large, which is especially suitable for the continuity of extruded products. |
| First®<br>DPTU(CA)-75<br>DPTU(CA)-80 |  | N-N'- diphenyl thiourea | EPDM/SBR | Accelerator for rapid vulcanization of natural rubber and chloroprene rubber products; the critical temperature of vulcanization is 80 ℃ , so attention shall be paid to avoid early vulcanization when mixing, and the activity is higher above 100℃ ; the obtained products are tough, excellent in tensile strength and flexural flexibility, but the products will change color by light; it is also used as a heat stabilizer for emulsion polymerization of PVC, especially for soft products. It cannot be used with stabilizers such as lead and cadmium, otherwise it will lead to discoloration of products. |



| 商品名 | 外观 | 化学成分 | 聚合物载体 | 特性与应用 |
|---|---|---|---|---|
| First®<br>DBTU-75 |  | N,N'- di-n-butyl thiourea | EPDM/SBR | This product is a rapid vulcanization accelerator for chloroprene rubber, which can also promote the vulcanization of natural rubber, styrene-butadiene rubber, butyl rubber and EPDM rubber. The performance of DBTU is similar to that of ETU and DETU, and it is suitable for rubber compound with low vulcanization temperature, and the physical properties of the product are good. DBTU has certain ozone resistance in natural rubber, chloroprene rubber, nitrile rubber and styrene-butadiene rubber, and can be used as deodorant. |
| First®<br>PUR-75 | NEW  | 1, -diethylthiourea | EPDM | A new thiourea accelerator with the same performance as ethylenethiourea (ETU) completely replaces ETU in CR chloroprene rubber, and basically has the same physical properties and aging resistance of vulcanized rubber. It is also a secondary accelerator for common diene rubber including EPDM, with the dosage of 0.5-1.0PHR. |
| First®<br>MTT-80 |  | 3- methyl -2-thiazolethione | EPDM/SBR | This product is an environmental accelerator of thiazole heterocyclic compounds, which contains active sulfur atoms and crosslinks halogen polymers. It is suitable for chlorinated butyl and chloroprene rubber, especially as an efficient accelerator for chloroprene rubber. Compared with ETU, it keeps the good physical properties and aging resistance of ETU vulcanized chloroprene rubber, improves the scorching property and operation safety of the rubber compound, and has a faster vulcanization speed. |

## Dithiocarbamates

| 商品名 | 外观 | 化学成分 | 聚合物载体 | 特性与应用 |
|---|---|---|---|---|
| First®<br>ZDMC(PZ)-75 |  | Zinc dimethyl dithiocarbamate | EPDM | Natural rubber and synthetic rubber overspeed accelerators. It is especially suitable for butyl rubber with high compression deformation requirements and nitrile rubber with excellent aging resistance, and is also suitable for ethylene propylene diene monomer; it is often used as a secondary accelerator for thiazole and sulfenamide accelerators. When used with DM, the resistance to scorch increases with the increase of DM dosage. It is easy to disperse, easy to weigh, tasteless, pollution-free and discoloration-free; it has been approved by FDA in the United States, and can be used in adhesive tapes, rubber products for food and medicine, especially for transparent, light and bright rubber products. |
| First®<br>ZDBC(BZ)-75<br>ZDBC(BZ)-80 |  | Zinc dibutyldithio carbamate | EPDM | Overspeed accelerators for natural rubber and synthetic rubbers. Its activity and solubility are higher than those of ZDEC, and its suitable vulcanization temperature is 90-110 ℃ . It is often used as a good activator of thiazole accelerators; it can improve the aging resistance of vulcanized rubber; it has no discoloration, no pollution and has easy dispersion; it is very suitable for high transparency or light color rubber products. |

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® ZDEC(EZ)-75 |  | Zinc diethyl dithiocarbamaate | EPDM | It is used as overspeed accelerator for natural rubber and synthetic rubbers. The representative varieties of zinc dithiocarbamate are often good activators of thiazole and sulfenamide accelerators. Adding a small amount of DM, TMTD, PVI and antioxidant MB can improve the storage and delay vulcanization of rubber compound. It has no pollution, no discoloration, no odor, no taste, no toxicity and has easy dispersion; it is very suitable for white and bright products and transparent products, mainly used for manufacturing tires, inner tubes, medical care, adhesive tapes and self-vulcanization products. |
| First® ZBEC(ZTC)-70 ZBEC(ZTC)-75 |  | Zinc dibenzyl dithiocarbamate | EPDM | Overspeed accelerators for NR, EPDM, IR, SBR, NBR, IIR and other synthetic rubbers; it belongs to the secondary amino dithiocarbamates accelerator, which does not produce nitrosamines during vulcanization. It is usually used as an environmental protection vulcanization system together with TBBS-80GE, TBzTD-75GE, etc. It is the best resistance to scorch among all zinc dithiocarbamate accelerators. |
| First® ZnEPDC(PX)-75 |  | N-Ethyl-N-phenyldithio carbamic acid zinc salt | EPDM | It is a super accelerator suitable for natural rubber, styrene-butadiene rubber and nitrile butadiene rubber. The critical temperature of vulcanization is lower, the activity is higher than that of thiuram accelerator, the vulcanization temperature is 80-125℃, and it can also be used for vulcanization at normal temperature; ZnEPDC-80GE is pollution-free, discoloration-free, odorless, tasteless, nontoxic, and is easy to disperse and weigh; it can be used to make products in contact with food, transparent and colorful products, medical products, adhesive tapes, self-vulcanization mucilage, etc. |
| First® TDEC-75 |  | Tellurium diethyldithio carbamate | EPDM | It is used as an overspeed vulcanization accelerator for NR, SBR, NBR, EPDM, IIR and other rubbers; it is often used as an activating accelerator for thiazole, thiuram and dithiocarbamates accelerators; with respect to IIR or EPDM with slow vulcanization speed and low hardness compound with high filling softening oil, it can significantly shorten the vulcanization time and improve the crosslinking density; it is non-toxic, slightly odorous, easy to disperse, and easy to weigh, with low processing loss; it is very suitable for continuous vulcanization, and the product has good stiffness. |
| First® CDD-80 |  | Copper dimethyldithio carbamate | EPDM | It is a rapid vulcanization accelerator for NR, SBR, NBR, IIR and EPDM systems, especially for SBR, IIR and EPDM systems; the vulcanization efficiency is better than TT and PX, and it is easy to scorch. Thiazole and sulfenamide accelerators are usually used to improve the safety of their rubber compounds. In thiazole accelerator system, whether used alone or as an auxiliary accelerator, its dosage is the smallest, and this product has slight rubber dyeability. |
| First® ZEPC-75 ZEPC-80 |  | N-Ethyl-N-phenyldithio carbamic acid zinc salt | EPDM | It is a safe overspeed accelerator with excellent resistance to scorch, which is not suitable for latex vulcanization, and has the characteristics of little influence on the viscosity of latex during storage, with no pollution and no discoloration, which is odorless, tasteless and non-toxic. |



## Dithiophosphates

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® ZAT-70 | NEW  | Zinc dialkyl dithiophosphate | EPDM/EVM | It is a special accelerator for quick and pollution-free vulcanization of NR and EPDM compound, which conforms to European standards and is suitable for molding and extruding products, such as tire buffer layer, sealing strip, film, fender pad and so on. |
| First® ZBPD-50GE |  | Zinc O,O- dibutyl dithiophosphate | EPDM | It is a rapid vulcanization accelerator for NR and EPDM; it has no frost spraying, with easy dispersion and stable product performance; it has no amino structure, and is often used in vulcanization systems without nitrosamines, and has good reduction resistance; it is often used in light, bright and white rubber products. It also replaces DPG as the secondary accelerator to reduce the toxicity of DPG to rubber compound. When it is used to manufacture articles in contact with food, it needs to refer to regulations of Class 4 in BgVV XXI, but there is no regulation in the FDA's application of contact with food. |
| First® ZDTP-50GE |  | Zinc dialkyl dithiophosphate | EPDM | It is used as a rapid vulcanization accelerator for NR and EPDM, it has no amino structure and is often used in vulcanization systems without nitrosamines, and has good reduction resistance; in the effective vulcanization system, the vulcanizate has good heat resistance; in NR and EPDM containing sulfur, zinc oxide, thiazole and thiuram accelerator, it is used as a special accelerator and an activating accelerator, with high crosslinking degree and safe processing; when used to manufacture articles in contact with food, refer to the regulations of Class 4 in BgVV XXI, but there is no regulation in the FDA's application of contact with food. |
| First® ADT-50 | NEW  | Dialkyl dithiophosphate amine | EPDM/EVM | It is a special accelerator for rapid and pollution-free vulcanization of NR and EPDM compounds, which meets European standards and does not contain secondary amines that can produce toxic nitrosamines. |

## Amine

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® HMT(H)-80GE |  | Hexamethyl enetetramine | EPDM/ SBR | It is a slow and weak accelerator for rubber, and is often used as an activating accelerator; the critical temperature of vulcanization is 140 ℃. When the vulcanization temperature is low, the activity is poor, but the risk of scorch is small. Zinc oxide increases its activity, while clay and carbon black inhibit it; it has easy dispersion, and has no pollution and no discoloration in the rubber compound; it is mainly used for making light-colored, transparent and thick products; HMT, resorcinol and silica constitute a "meta-methyl white (HRH)" system, which plays a significant role in improving the adhesive strength between rubber and fiber materials. |
| First® HMMM-50GE |  | Hexamethoxyme thyl melamine | EPDM/ SBR | It is a rubber adhesive, which reacts with methylene acceptor at vulcanization temperature in "M-Methylwhite (HRH)" system, plays a role in bonding rubber and skeleton materials; as a vulcanization agent, it reacts with non-reactive phenolic resin to generate thermosetting resin, which improves the strength, modulus, hardness and tear of rubber. Compared with HMT, this product is more environmentally friendly and has extremely low formaldehyde content. |

## Comprehensive accelerator

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® MAC-3108 |  | Environment-friendly and efficient accelerator without thiazole structure | EPDM/SBR | It is a comprehensive environmental protection accelerator suitable for NR,SBR,BR,EPDM, IIR and other rubbers. It can be used as the main accelerator alone, or it can be used together with a small amount of TBZTD-75Ge, ZPEC-75Ge, ZTP-50E to form an environment-friendly vulcanization promotion system. It has fast vulcanization speed, with no mercaptobenzothiazole structure, no bitterness, no nitrosamine carcinogen during vulcanization, and may turn from light yellow to gray during storage, but it has no rubber dyeability. |
| First® EM33-75GE |  | EPDM Composite accelerator | EPDM | It is a comprehensive accelerator special for EPDM, has high vulcanization efficiency and good vulcanization flatness; it can be used alone, but can also be used with ZDBC, ZDEC, with faster vulcanization speed; it has no pollution, no discoloration, and has easy dispersion. It can be used in white or light-colored rubber products; it is commonly used in EPDM sealing strips, hoses, molded products, etc. |
| First® EM33A-75GE | NEW  | Compounds of macromolecule, high melting point and high boiling point accelerators | EPDM | It is compounded with macromolecule, high melting point, high boiling point and low volatility accelerator, which is suitable for diene rubber such as EPDM, NR,NBR,SBR, etc., especially for products with low odor requirements such as EPDM molding and extrusion, and the dosage is 3.5-5.0PHR. |
| First® EM33HA-75GE | NEW  | Compound of environment-friendly accelerator without nitrosamine | EPDM | It is compounded with macromolecule, high melting point, high boiling point and low volatility, which is suitable for diene rubber such as EPDM, NR,NBR,SBR, etc., especially the rubber products of EPDM molding and extrusion processes. It has passed the environmental protection tests such as REACHSVHC and nitrosamine, and the dosage is 3.5-5.0PHR. |
| First® EM-33G |  | EPDM Composite accelerator | EPDM | It is a composite accelerator special for EPDM, has high vulcanization efficiency and good vulcanization flatness; it can be used alone, but can also be used with ZDBC, ZDEC, with faster vulcanization speed; it has no pollution, no discoloration, and has easy dispersion. It can be used in white or light-colored rubber products; it is commonly used in EPDM sealing strips, hoses, molded products, etc. |
| First® MAC-1489 |  | Efficient anti-yellowing accelerator | EPDM | Excellent yellowing resistance, and other materials are stable in the formula.<br>Under the condition, it can reach 4.0~5; moderate vulcanization speed, wear resistance after vulcanization,<br>The tensile strength and tear resistance are equivalent to those of ordinary accelerated products; no pollution,<br>no discoloration, so that the appearance hue of rubber products remains stable,<br>it is prominently applied in rubber soles; the rubber compound of this product has good resistance to scorch.<br>It can be stored for 3-5 days at room temperature, which overcomes the problem of short scorching time of common yellowing-resistant accelerators.<br>It is mainly used in white, light and bright rubber soles and other rubber products. |



| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® MAC-1108 |  | Efficient composite accelerator | EPDM/SBR | It is suitable for NR, SBR, BR, IR, NBR and other composite accelerators,The vulcanization speed is faster and the vulcanization flatness is better; it can be used as the main accelerator but also can be used with thiuram, guanidine, aldehyde amine accelerators; it can be used in light and dark rubber products such as rubber shoes, balls, hoses, etc. |
| First® MAC-2108 |  | Efficient composite accelerator | EPDM/SBR | It is commonly known as 2# accelerator, and is suitable for NR, SBR, BR, IR and NBR.and other composite accelerators, with moderate vulcanization speed and good vulcanization flatness; It is used as a main accelerator, and also promoted with thiuram, guanidine and aldehyde amine.The vulcanization speed is faster when the feed is used together; it can be used in light and dark rubber.Products such as rubber shoes, balls, hoses, etc., especially suitable for thick products and products requiring long scorch time. |

## Vulcanizing agents

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® S-65 S-80 |  | Sulphur | EPDM/SBR | It is a universal vulcanizing agent for natural rubber and synthetic rubber. Excellent dispersibility and operability, are especially suitable for low hardness rubber. It can be evenly dispersed in rubber, thus avoiding local over-sulfur. It is especially suitable for rubber materials that need to be mixed for a short time. It is suitable for tires, hoses, tapes, rubber shoes and general industrial products. |
| First® IS-65 IS60-80 |  | Insoluble sulfur | EPDM/SBR | It is a vulcanizing agent for natural rubber and synthetic rubber; high in thermal stability, it improves the migration of sulfur in the processing and storage period of rubber compound, reduces the sulfur spraying of accelerators (such as thiazoles) and improves the adhesion between rubber compound and other skeleton materials; it is suitable for tires, hoses, tapes, shoes and industrial products. |
| First® IS90-70 IS90-80 |  | insoluble sulfur | EPDM/SBR | It is a vulcanizing agent for natural rubber and synthetic rubber; high in thermal stability, it improves the migration of sulfur in the processing and storage period of rubber compound, reduces the sulfur spraying of accelerators (such as thiazoles) and improves the adhesion between rubber compound and other skeleton materials; it is suitable for tires, hoses, tapes, shoes and industrial products. |
| First® DTDM-80 |  | 4-4'-dimorpholine disulfide | EPDM | It can be used as vulcanizing agent and accelerator for NR, SBR, NBR, EPDM and other rubbers; it can release active sulfur at the vulcanization temperature, the effective sulfur content is 21.6%, the operation is safe, the vulcanization speed is slow when it is used alone, and the vulcanization speed can be improved when it is used together with thiazoles, thiuram and dithiocarbamate; when used in effective and semi-effective vulcanization systems, the obtained vulcanizate has good heat resistance and aging resistance; the compound is free from frost, pollution, discoloration, dispersion and weighing. |

| 商品名 | 外观 | 化学成分 | 聚合物载体 | 特性与应用 |
|---|---|---|---|---|
| First® DTDC-80 |  | Dicaprolactam disulfide | EPDM | It is an environmental-friendly vulcanizing agent for rubbers such as NR, SBR and NBR; it replaces DTDM in equal amount; it is nitrosamine-free; it is easy to disperse in the rubber compound, does not spray frost, is safe to scorch and has fast vulcanization speed; its vulcanized rubber has good mechanical properties, heat resistance, aging resistance and small compression permanent deformation; it is the best vulcanizing agent for manufacturing large-scale model rubber products, heat-resistant rubber products, sanitary rubber products and colored rubber products such as wires, cables, heat-resistant products, thick products and medical plugs. |
| First® PDM-75 |  | N,N'-m-phenylene bismaleimide | EPDM | It is used as a multifunctional rubber additive, and is compounded with sulfur in natural rubber to resist vulcanization and reversion; as an auxiliary vulcanizing agent, it also reduces the dosage of peroxide, significantly improves the crosslinking degree and heat resistance, and is suitable for high-temperature vulcanizing systems, obviously reduces the pressure change and improves the resistance to scorch of rubber compounds; as a sulfur-free vulcanizing agent for cable rubber, it replaces all sulfur-containing vulcanizing agents such as thiazoles and thiuram, and solves the problem that copper wires and copper appliances are blackened by copper sulfide generated by contacting with sulfur-containing vulcanizing agents. |
| First® HMDC-75 |  | Hexamethylene diamine carbamate | EPDM/ AEM | It is mainly used as vulcanizing agent for fluorine rubber, ethylene acrylate rubber and polyurethane rubber, as modifier for synthetic rubber and vulcanizing activator for natural rubber, butyl rubber, isoprene rubber and styrene-butadiene rubber. After use, the rubber products can keep their original bright colors. It is also the cross-linking agent of AEM(VAMAC), which is easy to disperse in AEM and the product quality is stable. The common vulcanization system of AEM compound is HMDC combined with DOTG or DPG. |
| First® TCY-70 |  | Thiocyanic acid | EPDM/ AEM | It is widely used as vulcanizing agent for acrylate and other chlorine-containing rubber, natural rubber and rubber-plastic blends (such as NBR/PVC); the vulcanization speed is fast, the scorch is safe, and the vulcanization time can be shortened without secondary vulcanization. The prepared vulcanized rubber has the characteristics of good physical and mechanical properties, oil resistance, heat resistance, compression deformation resistance and the like; it can improve the aging resistance of diene rubber products, promote the good adhesion between polymers and metals, and is a copper damage inhibitor; |
| First® FSH-75 | NEW  | Triazole mercaptoamine derivative | ACM/CM | It is a new special vulcanizing agent that is suitable for molding vulcanization of halogen rubber such as chloroprene, chlorinated polyethylene, polyvinyl chloride, fluororubber, etc. After cross-linking, it solves the unstable structure of polymer containing chlorine or fluorine macromolecules, branched chain, double bond, allyl chloride, tertiary chlorine, etc., and improves the product toughness, thermal deformation resistance, weather resistance, ultraviolet resistance, solvent resistance, excellent electrical performance, and the dosage is 2.5-5.0PHR. |





## Coking inhibitor

| 商品名 | 外观 | 化学成分 | 聚合物载体 | 特性与应用 |
|---|---|---|---|---|
| First® CTP-80 |  | N- cyclohexyl thiophthalimide | EPDM/SBR | It is a very effective early vulcanization inhibitor, which has little effect on the positive vulcanization time; Usually used together with sulfenamide or thiazole accelerators, it can effectively prevent the rubber from burning during high-temperature processing, thus making it possible for the calender and extruder to run at high temperature and high speed, and improving the production capacity of vulcanizer; Improving the storage stability of rubber compound can regenerate rubber compound which has been treated at high temperature or is in danger of scorching. |
| First® E/C-80 |  | N- phenyl -N-[ (trichloromethyl) thio] benzenesulfonamide | EPDM/EVM | It is a high temperature effective anti-scorch agent suitable for natural rubber, synthetic rubber and rubber with multiple vulcanization promotion systems (especially EPDM); it can effectively prevent the rubber compound from scorching ahead of time during processing and storage, and can greatly improve the safety of operation; compared with CTP, E/C has better anti-scorch effect at high temperature, less dosage and lower odor, and does not produce nitrosamines during vulcanization. It is especially suitable for rapid vulcanization at high temperature. |

## Active agent series

### Grade A zinc oxide (indirect zinc oxide)

| 商品名 | 外观 | 化学成分 | 聚合物载体 | 特性与应用 |
|---|---|---|---|---|
| First® ZnO-A100G | NEW  | Grade A zinc oxide nano-coating particles | / | It is used as an active agent and a vulcanizing agent in rubber such as NR, BR, SBR, NBR, IR, EPDM, CR etc., it is suitable for tires, automobile sealing strips, damping element, dustproof cover, hoses, adhesive tapes, rubber shoes, miscellaneous parts, etc., and does not fly or lose during batching operation and processing. At the same amount, it has the same vulcanization speed and physical properties as indirect zinc oxide pure powder, and the dosage is 4-6PHR. |
| First® ZnO-A80GE |  | 80% indirect zinc oxide +20%EPDM | EPDM | It is an inorganic active agents, reinforcing agents, heat conducting agents and coloring agents of natural and synthetic rubber, as well as vulcanizing agents of chloroprene rubber, and can be used together with magnesium oxide to improve resistance to scorch; it can activate accelerators such as thiazole, sulfenamide, guanidine and thiuram; this product is easy to operate and fast to disperse. |
| First® ZnO-A100 |  | Grade A zinc oxide nano-coating | / | It is an inorganic active agents, reinforcing agents, heat conducting agents and coloring agents of natural and synthetic rubber, as well as vulcanizing agents of chloroprene rubber, and can be used together with magnesium oxide to improve resistance to scorch; it can activate accelerators such as thiazole, sulfenamide, guanidine and thiuram. |

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® ZnO-A80 |  | Grade A zinc oxide nano-coating | / | It is an inorganic active agents, reinforcing agents, heat conducting agents and coloring agents of natural and synthetic rubber, as well as vulcanizing agents of chloroprene rubber, and can be used together with magnesium oxide to improve resistance to scorch; it can activate accelerators such as thiazole, sulfenamide, guanidine and thiuram. It is commonly used as active agent for thermal insulation rubber hose and EVA products. |
| First® ZnO-A70 |  | Grade A zinc oxide nano-coating | / | It is an inorganic active agents, reinforcing agents, heat conducting agents and coloring agents of natural and synthetic rubber, as well as vulcanizing agents of chloroprene rubber, and can be used together with magnesium oxide to improve resistance to scorch; it can activate accelerators such as thiazole, sulfenamide, guanidine and thiuram. It is commonly used as active agent for thermal insulation rubber hose and EVA products. |
| First® ZnO-A60 |  | Grade A zinc oxide nano-coating | / | It is an inorganic active agents, reinforcing agents, heat conducting agents and coloring agents of natural and synthetic rubber, as well as vulcanizing agents of chloroprene rubber, and can be used together with magnesium oxide to improve resistance to scorch; it can activate accelerators such as thiazole, sulfenamide, guanidine and thiuram. It is commonly used as active agent for thermal insulation rubber hose and EVA products. |
| First® ZnO-A50 |  | Grade A zinc oxide nano-coating | / | It is an inorganic active agents, reinforcing agents, heat conducting agents and coloring agents of natural and synthetic rubber, as well as vulcanizing agents of chloroprene rubber, and can be used together with magnesium oxide to improve resistance to scorch; it can activate accelerators such as thiazole, sulfenamide, guanidine and thiuram. It is commonly used as active agent for thermal insulation rubber hose and EVA products. |



## Active zinc oxide

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® ZnO-H80GE |  | 80% active zinc oxide +20%EPDM | EPDM/SBR | It is an inorganic activator of natural and synthetic rubber which is easy to disperse and weigh, and can be used in large quantities; It can improve the viscosity of rubber compound, improve the shape stability of extruded products and free vulcanized products and the mechanical properties of vulcanized rubber; Suitable for rubber products such as tires, hoses, tapes and rubber shoes. |
| First® ZnO-H100G |  | Active zinc oxide nano-coating particle | / | It is used as an active agent in rubber such as NR,BR,SBR,NBR,IR,EPDM, etc., it is suitable for tires, automobile sealing strips, hoses, adhesive tapes, rubber shoes, miscellaneous parts, etc., and does not fly or lose during batching operation and processing. At the same amount, it has the same vulcanization speed and physical properties as 95.0% active zinc oxide pure powder, and the dosage is 4-6PHR. |
| First® ZnO-H100 |  | Active zinc oxide Nanocoating | / | It is an inorganic active agent of natural and synthetic rubber which is easy to disperse and can be used in large quantities; it can improve the viscosity of rubber compound, improve the shape stability of extruded products and free vulcanized products and the mechanical properties of vulcanized rubber; Suitable for rubber products such as tires, hoses, tapes and rubber shoes. |
| First® ZnO-H80 |  | Active zinc oxide Nanocoating | / | It is an inorganic active agent of natural and synthetic rubber which is easy to disperse and can be used in large quantities; it can improve the viscosity of rubber compound, improve the shape stability of extruded products and free vulcanized products and the mechanical properties of vulcanized rubber; it is suitable for rubber products such as tires, hoses, tapes and rubber shoes. |
| First® ZnO-H70 |  | Active zinc oxide Nanocoating | / | It is an inorganic active agent of natural and synthetic rubber which is easy to disperse and can be used in large quantities; it can improve the viscosity of rubber compound, improve the shape stability of extruded products and free vulcanized products and the mechanical properties of vulcanized rubber; it is suitable for rubber products such as tires, hoses, tapes and rubber shoes. |
| First® ZnO-H60 |  | Active zinc oxide Nanocoating | / | It is an inorganic active agent of natural and synthetic rubber which is easy to disperse and can be used in large quantities; it can improve the viscosity of rubber compound, improve the shape stability of extruded products and free vulcanized products and the mechanical properties of vulcanized rubber; it is suitable for rubber products such as tires, hoses, tapes and rubber shoes. |
| First® ZnO-H50 |  | Active zinc oxide Nanocoating | / | It is an inorganic active agent of natural and synthetic rubber which is easy to disperse and can be used in large quantities; it can improve the viscosity of rubber compound, improve the shape stability of extruded products and free vulcanized products and the mechanical properties of vulcanized rubber; it is suitable for rubber products such as tires, hoses, tapes and rubber shoes. |
| First® ZnO-H40 |  | Active zinc oxide Nano-coating | / | It is an inorganic active agent of natural and synthetic rubber which is easy to disperse and can be used in large quantities; it can improve the viscosity of rubber compound, improve the shape stability of extruded products and free vulcanized products and the mechanical properties of vulcanized rubber; it is suitable for rubber products such as tires, hoses, tapes and rubber shoes. |

## Transparent zinc oxide

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® ZnO-T75GE |  | 75% transparent zinc oxide +25%EPDM | EPDM/ SBR | It is an inorganic activator of natural and synthetic rubber, sometimes replacing zinc oxide; its vulcanized rubber has light color, high transparency and high solubility, and can be used in large quantities. Its hardening effect in rubber compound is stronger than that of ordinary zinc oxide, and it is mainly used in transparent or translucent rubber products, such as shoe materials, elastic rubber and light or bright daily necessities. |
| First® ZnO-T100 |  | 100% transparent zinc oxide | / | It is an inorganic activator of natural and synthetic rubber, sometimes replacing zinc oxide; its vulcanized rubber has light color, high transparency and high solubility, and can be used in large quantities. Its hardening effect in rubber compound is stronger than that of ordinary zinc oxide, and it is mainly used in transparent or translucent rubber products, such as shoe materials, elastic rubber and light or bright daily necessities. |
| First® ZnO-T70 |  | Transparent zinc oxide coating | / | It is an inorganic activator of natural and synthetic rubber, sometimes replacing zinc oxide; its vulcanized rubber has light color, high transparency and high solubility, and can be used in large quantities. Its hardening effect in rubber compound is stronger than that of ordinary zinc oxide, and it is mainly used in transparent or translucent rubber products, such as shoe materials, elastic rubber and light or bright daily necessities. |
| First® ZnO-T60 |  | Transparent zinc oxide coating | / | It is an inorganic activator of natural and synthetic rubber, sometimes replacing zinc oxide; its vulcanized rubber has light color, high transparency and high solubility, and can be used in large quantities. Its hardening effect in rubber compound is stronger than that of ordinary zinc oxide, and it is mainly used in transparent or translucent rubber products, such as shoe materials, elastic rubber and light or bright daily necessities. |
| First® ZnO-T50 |  | Transparent zinc oxide coating | / | It is an inorganic activator of natural and synthetic rubber, sometimes replacing zinc oxide; its vulcanized rubber has light color, high transparency and high solubility, and can be used in large quantities. Its hardening effect in rubber compound is stronger than that of ordinary zinc oxide, and it is mainly used in transparent or translucent rubber products, such as shoe materials, elastic rubber and light or bright daily necessities. |
| First® ZnO-T40 |  | Transparent zinc oxide coating | / | It is an inorganic activator of natural and synthetic rubber, sometimes replacing zinc oxide; its vulcanized rubber has light color, high transparency and high solubility, and can be used in large quantities. Its hardening effect in rubber compound is stronger than that of ordinary zinc oxide, and it is mainly used in transparent or translucent rubber products, such as shoe materials, elastic rubber and light or bright daily necessities. |



## Nano-zinc oxide

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® ZnO-N100 |  | Nano-zinc oxide | / | It is an inorganic activator of natural and synthetic rubber; the powder has nanometer particle size, large specific surface area, high activity and small dosage, which can replace conventional zinc oxide and effectively reduce the cost and product weight. The recommended dosage is 2-3PHR. |
| First® ZnO-N50GE | NEW  | Nano-zinc oxide particles | EPDM/ SBR | Nano-zinc oxide masterbatch particle is used as an active agent in NR,BR,SBR,NBR,IR,EPDM and other rubbers. It does not fly and is not lost during batching operation and processing. The recommended dosage is 4-6PHR. |
| First® ZnO-N50 |  | Nano-zinc oxide coating | / | It is an inorganic activator of natural and synthetic rubber; the powder has nanometer particle size, large specific surface area, high activity and small dosage, which can replace conventional zinc oxide and effectively reduce the cost and product weight. The recommended dosage is 4-6PHR. |
| First® ZnO-N60 |  | Nano-zinc oxide coating | | It is used as an active agent in NR, BR, SBR, NBR, EPDM and other rubber compounds, and is commonly used in bicycle tires, sealing strips, hoses, adhesive tapes, racetracks and soles, with the recommended dosage of 4-6PHR. |
| First® ZnO-TC60 |  | Nano-zinc oxide coating | | It is used as an active agent in NR, BR, SBR, NBR and other rubber compounds, and is often used in light-colored and transparent rubber products. The recommended dosage is 4-6PHR. |

## Organic active agent

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® AW-560 |  | Higher alcohol amine derivatives | / | It is a tertiary amine mixture is a white filler activator, which neutralizes hydroxyl groups in light fillers (especially white smoke), improves surface activity and improves the dispersibility of white smoke in rubber compound; it improves the strength of rubber compound and improves the shrinkage of products; it replaces part or all of PEG-4000 in the formula to reduce the cost; it is suitable for rubber products, such as soles, hoses, adhesive tapes and other light-colored products. This product can be used in ACM and AEM compound products instead of DOTG and 1# vulcanizing agent. |
| First® PEG-4000 |  | Polyethyleneglycol | / | It is a white filler activator (especially white smoke) that can improve the tensile strength of products and reduce compression deformation; it can neutralize the hydroxyl group in the filler, improve the surface activity and improve the dispersibility of white smoke in the rubber compound; in the products of microwave vulcanization, it improves the efficiency of microwave vulcanization; it is helpful for the product to leave the mold and improve the surface smoothness. |
| First® PEG-6000 |  | Polyethyleneglycol | / | It is a white filler activator (especially white smoke) that can improve the tensile strength of products and reduce compression deformation; it can neutralize the hydroxyl group in the filler, improve the surface activity and improve the dispersibility of white smoke in the rubber compound; in the products of microwave vulcanization, it improves the efficiency of microwave vulcanization; it is helpful for the product to leave the mold and improve the surface smoothness. |



Foaming agent series

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® EWE-60GE EWE-65GE |  | Microsphere physical foaming agent | EPDM/EVM | As a high-end foaming agent, it can be used in various synthetic rubber products, which can obviously improve the specific gravity of the products; Compared with chemical foaming agent, its physical and mechanical properties such as hardness, tensile strength, tear strength and elongation have superior high retention rate, and it is suitable for all kinds of plastic rubber products, especially door and window sealing strips, with light weight and excellent sealing effect. |
| First® OBSH-75GE |  | 4,4-oxo-diphenyl sulfonyl hydrazine | EPDM | It is an organic foaming agent commonly used in rubber; it is suitable for medium and low temperature foaming process without accelerant; the decomposition temperature is 158℃ , and the gas output is 93.0-105.0ml/g; it is easy to weigh, and is easy to disperse, with no flying, no pollution and no fading. |



| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® AC7000-75GE |  | Azodicar bonamide | EPDM | It is a commonly used universal high-temperature foaming agent; it is widely used in rubber and plastic foaming, such as PE,PS,EVA,PVC and rubber-plastic foaming products; the decomposition temperature is 200-210, and the gas generation rate is 210-225ml/g (in air); it is widely used in rubber sealing strips, sports equipment, thermal insulation materials and shoe materials. |
| First® AC3000-75GE |  | Azodicar bonamide | EPDM | It is a commonly used universal high-temperature foaming agent; it is widely used in rubber and plastic foaming, such as PE,PS,EVA,PVC and rubber-plastic foaming products; the decomposition temperature is 200-210, and the gas generation rate is 210-225ml/g (in air); it is widely used in rubber sealing strips, sports equipment, thermal insulation materials and shoe materials. |
| First® ADC-D10 |  | Azodicar bonamide | / | It is a commonly used universal high-temperature foaming agent; it is widely used in rubber and plastic foaming, such as PE,PS,EVA,PVC and rubber-plastic foaming products; it is widely used in sports equipment, thermal insulation materials and shoes; the decomposition temperature is 200-210, the gas generation rate is 280-300 ml/g(In air), and the average particle size is 7.5-10.5um. |
| First® ADC-D6 |  | Azodicar bonamide | / | It is a commonly used universal high-temperature foaming agent; it is widely used in rubber and plastic foaming, such as PE,PS,EVA,PVC and rubber-plastic foaming products; it is widely used in sports equipment, thermal insulation materials and shoes; the decomposition temperature is 200-210, the gas generation rate is 280-300ml/g(In air), and the average particle size is 4.5-6.5um. |
| First® ADC-D4 |  | Azodicar bonamide | / | It is a commonly used universal high-temperature foaming agent; it is widely used in rubber and plastic foaming, such as PE,PS,EVA,PVC and rubber-plastic foaming products; it is widely used in sports equipment, thermal insulation materials and shoes; the decomposition temperature is 200-210, the gas generation rate is 280-300ml/g(In air), and the average particle size is 3.4-4.2um. |
| First® PTSS-75GE |  | P-toluenesulfonyl hydrazine | EPDM | This product is a high-temperature foaming agent, which is especially suitable for rubber and plastic products processed at high temperature, and is used as foaming agent for synthetic rubber such as natural rubber and styrene-butadiene rubber. It has good processing safety, without the risk of premature foaming. Adding some active agents, such as using catalysts BM, TM and surface-treated urea, can reduce the decomposition temperature, which is suitable for low-temperature foaming products. |
| First® TSH |  | P-toluenesulfonyl hydrazine | / | This product is suitable for foaming agent of PVC and other plastics and natural synthetic rubber. Decomposition products are colorless, nontoxic, odorless and pollution-free; decomposition is quite slow; the product has small shrinkage and high tear strength, and is suitable for closed-cell foam plastics and sponge rubber such as sports shoes and adhesive tapes. This product cannot be used with aluminum salt additives or foaming agent H. |
| First® ZBS-75 |  | Zinc benzene sulfinate | EPDM | It is suitable for all foaming agents, especially AC, H and other foaming agents. It can reduce the foaming temperature, increase the gas output, improve the uniformity of foaming pore size, and effectively remove the odor decomposed by H foaming agent. It is non-discoloring, pollution-free and easy to disperse. It is often used in NR,SBR,EPDM,NBR and plastic foaming products. |

## Flow dispersant series (zinc-free)

| Trade name | Appearance | Chemical composition | Melting point | Characteristics and applications |
|---|---|---|---|---|
| First®<br>LF-31<br>Carbon black dispersant |  | A combination of higher fatty acid, fatty acid ester, fatty acid soap salt and wax | 65-75°C | It is used in natural rubber and synthetic rubber; in the process of mixing, it has a good lubricating effect on rubber macromolecules, reduces the friction heat generation between polymer molecules, prevents dead materials and significantly reduces the energy consumption of rubber mixing. It has a good wetting and dispersing effect on fillers such as carbon black, which is beneficial to the processability of rubber compound such as calendering and extrusion. It has no adverse effect on the vulcanization speed and physical properties of the compound; it is especially suitable for rubber products such as tire tread rubber, automobile shock absorber and conveyor belt. |
| First®<br>LF-32<br>Silica dispersant |  | It is a combination of fatty acid, fatty acid soap and fatty acid ester | 65-75°C | In the process of mixing, the uneven dispersion caused by the accumulation of white carbon black is effectively avoided, and the dispersion performance of white carbon black is significantly improved. It has a good wetting and dispersing effect on fillers such as white carbon black, which is beneficial to the processability of rubber compound such as calendering and extrusion. It has no adverse effect on the vulcanization speed and physical properties of the compound, and can be applied to natural rubber and synthetic rubber. |
| First®<br>LF-33<br>Special dispersant for extrusion |  | It is a combination of saturated fatty acid, fatty acid soap salt and fatty acid amide | 65-75°C | As a flow dispersant, it is especially suitable for internal mixer processing, and can be used in both natural rubber and synthetic rubber, such as NR, SBR, BR, NBR, EPDM, etc., especially EPDM. It can reduce the Mooney viscosity of rubber compound, reduce the temperature in the mixing process and prevent early scorch. It improves the processability of rubber compound, reduces the extrusion expansion rate of rubber compound, and makes the surface of products smoother. It increases the amount of injection and extrusion, reduces defective products and reduces the rate of defective production. It has no adverse effect on the vulcanization speed and physical properties of the compound. |
| First®<br>LF-34<br>Universal flow dispersant |  | It is a combination of higher fatty acid, fatty acid ester, fatty acid soap salt and wax | 65-75°C | It is used as a general flow dispersant, and is especially suitable for internal mixer processing, and can be used in NR, SBR, BR, NBR, EPDM and other rubbers, which can obviously improve the Mooney viscosity of raw rubber, reduce the internal mixing temperature, reduce energy consumption and prevent early scorch. It improves the roll adhesion of rubber compound, reduces the extrusion expansibility of rubber compound, and improves the surface smoothness of products. It increases the amount of injection and extrusion, reduces defective products and reduces the rate of defective production. It has no adverse effect on curing speed and physical properties of rubber compound. |
| First®<br>LF-35<br>EVA special dispersant |  | It is a combination of saturated fatty acid, fatty acid ester and fatty acid soap | 65-75°C | Dispersant for EVA and general plastic. In the process of mixing, it has a good lubricating effect on plastic macromolecules, reduces the friction heat generation between polymer molecules and significantly reduces the energy consumption of rubber mixing. It effectively avoids uneven dispersion caused by the accumulation of fillers, and significantly improves the dispersion performance of fillers. It has a good infiltration and dispersion effect on fillers, which is beneficial to the processability of rubber extrusion. In the peroxide vulcanization system, there is no adverse effect within the recommended dosage range. |
| First®<br>LF-36<br>Special flow dispersant |  | It is a combination of saturated fatty acid, fatty acid soap salt and fatty acid amide | 70-90°C | The Mooney viscosity of that mix rubber is reduced, the mixing time is shortened, and the energy is saved. It increases the extrusion rate of rubber compound, so that the product is easy to demould and the surface is smooth and flat. It eliminates the phenomenon of rubber sticking when mixing in open mill. It increases the amount of extrusion and injection, and improves the production capacity. It has no adverse effect on vulcanization speed and physical properties of rubber compound. It is suitable for special polar rubber such as FKM, ACM, AEM, ECO, EO, CSM and HNBR. |
| First®<br>LF-37<br>Flow exhaust agent |  | Low molecular weight polyethylene wax | 90-100°C | It improves the fluidity of the rubber compound, quickly reduces the Mooney viscosity of the rubber compound, shortens the mixing time, saves the energy consumption cost, facilitates the exhaust and improves the qualified rate of products. It is suitable for NB, SBR, NBR, EPDM and other rubber products, especially for halogen-containing rubber such as CR, ECO/CO, BIIR and CIIR. It is suitable for TPR, EVA and various plastics (PVC, PE, PP, ABS, etc.) |





## Flow demoulding series

| Trade name | Appearance | Chemical composition | Melting point | Characteristics and applications |
|---|---|---|---|---|
| First®<br>FM-41<br>Dispersed flow demoulding agent |  | A combination of saturated fatty acid soap salt and high-efficiency lubricant | 70-90°C | In rubber products such as extrusion molding, complex die, microcellular foaming, etc., it can improve the air exhaust and mould release, and obtain better dimensional stability. It reduces the viscosity of raw rubber, has lubrication and dispersion effects, and improves the fluidity of rubber compound. In the injection molding process, the injection quantity can be increased, especially in the mold with special shape. It can be applied to natural rubber and synthetic rubber, such as NR, SBR, BR, NBR, EPDM, etc. |
| First®<br>FM-42<br>Universal flow demoulding agent |  | A combination of saturated fatty acid soap salt and high-efficiency lubricant | 60-70°C | In rubber products such as extrusion molding, complex die, microcellular foaming, etc., it can improve the air exhaust and mold release, and obtain better dimensional stability. It reduces the viscosity of raw rubber, has lubrication and dispersion effects, and improves the fluidity of rubber compound. In the injection molding process, the injection quantity can be increased, especially in the mold with special shape. It can be applied to natural rubber and synthetic rubber, such as NR, SBR, BR, NBR, EPDM, etc. |
| First®<br>FM-45<br>Special flow demoulding agent | NEW  | A compound of modified amide, lipid and higher alcohol | 85-95°C | It has good smoothness, lubricity and high temperature stability, and has excellent demoulding, roll-off and dispersibility in fluororubber, acrylate rubber and halogen rubber products, and the dosage is 1-5PHR. |

## Plasticizer series

| Trade name | Appearance | Chemical composition | Melting point/ carrier | Characteristics and applications |
|---|---|---|---|---|
| First®<br>ZD-G12<br>Physical peptizer |  | It is a compound of saturated and unsaturated fatty acid zinc soap | 95-105°C | It has good lubricating and plasticizing effects on NR,BR,SBR and SBR, improves the fluidity of rubber compound and the dispersion of filler, rapidly reduces the Mooney viscosity of rubber compound, shortens the mixing time, improves the extrusion, calendering and extrusion speed, and improves the surface smoothness of products. The dosage is 1-2PHR. |
| First®<br>FL-20<br>Physical peptizer |  | Mixture of fatty acid zinc soap salts | 65-75°C | As an excellent physical peptizer for natural rubber and synthetic rubber, it starts to peptize at a lower mixing temperature, which can quickly promote the rapid mixing of fillers, shorten the mixing cycle, and has good compatibility, no frosting, and better one-stage mixing effect. |
| First®<br>FL-22<br>Semi-chemical peptizer |  | It is a compound of 2,2-diphenyl formamide diphenyl disulfide and fatty acid ester | SBR | It is a semi-chemical peptizer, commonly used for plasticizing NR and SBR, is added together with raw rubber to effectively improve the Mooney viscosity of rubber compound. It can be plasticated at high temperature and low temperature within the temperature range of 70-140 °C , significantly shortening the plasticizing time of natural rubber, improving production efficiency and reducing energy consumption. The dosage is 0.1-1.0PHR. |
| First®<br>FL-25<br>Chemical peptizer |  | 2,2- diphenyl formamide diphenyl disulfide | ≥136°C | This product is non-toxic and environmentally friendly DBD, which is used to replace toxic pentachlorophenol. It meets the requirements of modern environmental protection and has the advantages of non-toxicity, high efficiency and low dosage, especially suitable for natural rubber and synthetic rubber. |
| First®<br>FL-26<br>Chemical peptizer |  | 2,2- diphenyl formamide diphenyl disulfide | EPDM/SBR | This product is non-toxic and environmentally friendly DBD, which is used to replace toxic pentachlorophenol. It meets the requirements of modern environmental protection and has the advantages of non-toxicity, high efficiency and low dosage, especially suitable for natural rubber and synthetic rubber. |

## Resin series

| Trade name | Appearance | Chemical composition | Melting point | Characteristics and applications |
|---|---|---|---|---|
| First® RZ-100 C5 petroleum resin |  | C5 hydrocarbon resin | 110-120℃ | It has good mutual solubility with natural rubber and synthetic rubber, and can play the role of increasing viscosity, strengthening and improving flow; It has good infiltration to filler, which is beneficial to the dispersion of filler; it is suitable for all kinds of rubber and rubber products, especially in tire, shoemaking, pipe belt and other industries; it has light color, and can also be applied to light-colored rubber products. |
| First® RZ-101 C9 petroleum resin |  | C9 hydrocarbon resin | 110-120℃ | It has good mutual solubility with natural rubber and synthetic rubber, and can play the role of increasing viscosity, reinforcing and helping the flow of rubber compound. It has good infiltration to filler, which is beneficial to the dispersion of filler. It can improve the tensile strength, tear strength, wear resistance and flex resistance of vulcanized rubber. It is suitable for all kinds of dark rubber products, especially tires, shoes, pipe belts and other industries, with better results. |
| First® RZ-102 Resins, terpene |  | Resins, terpene | 110-120℃ | It has excellent color stability, and is suitable for natural rubber and synthetic rubber; the tackifier of hot melt adhesive is superior to rosin, rosin modified product and petroleum resin. It can improve the tensile strength, tear strength, wear resistance and flex resistance of vulcanized rubber; it is suitable for all kinds of dark or light-colored rubber products, especially tires, shoes, pipe belts and other industries, with better results. |
| First® RZ-103 Hydrogenated resin |  | C5 hydrogenation resin | 110-120℃ | It is a hydrogenated petroleum resin with good mutual solubility with natural rubber and synthetic rubber, and can increase viscosity, reinforce and improve the fluidity of rubber compound; it has good infiltration to filler, which is beneficial to the dispersion of filler; it can improve the tensile strength, tear strength, wear resistance and flexibility of vulcanized rubber; it is suitable for all kinds of rubber products, especially light or white rubber products; it can be used as tackifier for hot melt adhesive, pressure sensitive adhesive and sealant, and the product has good heat stability and little smell. |
| First® RZ-107 Tear-resistant resin |  | Novel functional hydrocarbon resin | 110-120℃ | It is a new type of functional resin which can significantly improve the viscosity of rubber compound and improve the processability. It has good compatibility with rubber; it effectively improves the cutting resistance, tear resistance, strength and hardness of tread compound, and prevents chipping; it can replace aromatic hydrocarbon and polycyclic aromatic hydrocarbon phenolic resin and meet the requirements of European REACH regulations. |
| First® RZ-110 Anti-slip resin |  | Non-thermally reactive phenol-formaldehyde resin | 110-120℃ | It is an anti-slip agent for various synthetic rubber and natural rubber, especially for synthetic rubber such as IIR, SBR, BR and EPDM. It has good compatibility with rubber and softening oil, so that the compound has excellent initial viscosity, high storage viscosity and wet-heat viscosity, which is obviously better than petroleum resin; because the phenolic hydroxyl groups in the molecular structure have the ability to form hydrogen bonds with each other and the degree of alkyl branching is large, the friction coefficient between the rubber compound and the contact interface can be obviously improved, thus playing the role of anti-sliding. |



| Trade name | Appearance | Chemical composition | Melting point | Characteristics and applications |
|---|---|---|---|---|
| First® RZ-113 Rubber homogenizer |  | Aliphatic, naphthenic and aromatic mixtures | 110-120℃ | It is a hydrocarbon resin mixture which can make rubber with different polarities and viscosities mix more evenly and fully, and is suitable for natural rubber and most synthetic rubber, especially for the mixing of elastomer application systems with different polarities. It can improve the dispersion of carbon black and other fillers, make the rubber compound mix more evenly, reduce mixing and processing time, and effectively reduce energy consumption. It is beneficial to the dimensional stability and surface smoothness of rubber compounds such as extrusion and calendering, effectively reducing the generation of bubbles and significantly improving the air tightness of vulcanized rubber. |
| First® Cusin-45 |  | Mixture of alkyl phenolic resin and zinc oxide | IIR | It is a vulcanizing agent for butyl rubber and other rubbers, which is especially suitable for vulcanizing butyl capsules and water tires. |

## Peroxide series

| Trade name | Appearance | Main chemical components | Self-accelerating decomposition temperature SADT/℃ | Characteristics and applications |
|---|---|---|---|---|
| First® DCP |  | Diisopropylbenzene peroxide | 75℃ | It is a general bridging agent for natural rubber, synthetic rubber and polyolefin, which is a white crystal or crystal powder, so attention shall be paid to the safety of the rubber compound during processing. The cross-linked product of this product has a strong odor and needs secondary vulcanization to effectively reduce it. If low odor is required, BIBP is recommended. |
| First® DCP-40P |  | Diisopropylbenzene peroxide | 75℃ | It is a general bridging agent for natural rubber, synthetic rubber and polyolefin; it is white powder with good processing safety; the cross-linked product of this product has a strong odor, which can be effectively reduced by secondary vulcanization. If low odor is required, it is recommended to use BIBP (odorless DCP). |
| First® DCP-40GE |  | Diisopropylbenzene peroxide | 75℃ | It is a general bridging agent for natural rubber, synthetic rubber and polyolefin; the pre-dispersed masterbatch has good processing safety, with no flying and no leakage during operation; the cross-linked product of this product has a strong odor, which can be effectively reduced by secondary vulcanization. If low odor is required, it is recommended to use BIBP (odorless DCP). |
| First® BIPB |  | Di-tert-butyl peroxyisopropyl | 80℃ | It is an odorless bridging agent for natural rubber, synthetic rubber and polyolefin, and it is a white crystal or crystal powder, so attention shall be paid to the safety of rubber compound during processing. At the same degree of crosslinking, the addition of this product is about two-thirds of DCP. |
| First® BIPB-40P |  | Benzene | 80℃ | It is an odorless bridging agent for natural rubber, synthetic rubber and polyolefin; at the same degree of crosslinking, the addition of BIBP is about two-thirds of DCP; it has good processing safety and low irritating odor of finished products. |
| First® BIPB-40GE |  | Di-tert-butyl peroxyisopropyl benzene | 80℃ | It is an odorless bridging agent for natural rubber, synthetic rubber and polyolefin; at the same degree of crosslinking, the addition of BIBP is about two-thirds of DCP; this product is a pre-dispersed masterbatch, which has good processing safety, with no flying and no leakage during operation, and the smell of vulcanized products is low. |



| Trade name | Appearance | Main chemical components | Self-accelerating decomposition temperature SADT/℃ | Characteristics and applications |
|---|---|---|---|---|
| First® 101-50GE DBPH-50GE |  | 2,5-dimethyl-2,5 bis (tert-butylperoxy) hexane | 80℃ | It is used as crosslinking agent for natural rubber, synthetic rubber and thermoplastic polyolefin, with bifunctional structure. It is commonly used as crosslinking agent and initiator for silicone rubber, chlorosulfonated polyethylene, polyurethane, EVA, etc. Compared with 3M and di-tert-butyl, it has excellent processing safety, with no leakage and good operability. Its vulcanized products have good physical properties and excellent heat resistance. |
| First® 101-50P DBPH-50P |  | 2,5-dimethyl-2,5 bis (tert-butylperoxy) hexane | 80℃ | It is used as crosslinking agent for natural rubber, synthetic rubber and thermoplastic polyolefin, with bifunctional structure. It is commonly used as crosslinking agent and initiator for silicone rubber, chlorosulfonated polyethylene, polyurethane, EVA, etc. Compared with 3M and di-tert-butyl, it has excellent processing safety, and good operability. Its vulcanized products have good physical properties and excellent heat resistance. |
| First® 3M(29)-50P |  | 1,1-bis (tert-butyl peroxide)-3,3,5-trimethyl cyclohexane | 60℃ | It is especially suitable for vulcanization transparent products, such as glass rubber soles. Transparency is one of the best varieties in peroxide vulcanization system. Approved by FDA, it is non-toxic and can be used for food-grade and pharmaceutical-grade products, such as pressure cooker sealing rings. The vulcanization speed is fast, and the compression set is small. The vulcanization speed will be faster if the bridging agent TAIC or TMPTMA is used. It is suitable for vulcanization of EPDM, NBR, silicone rubber, chlorosulfonated polyethylene and polyurethane rubber. |

# Cross-linking agent and bridging agent series

| Trade name | Appearance | Main chemical components | Carrier | Characteristics and applications |
|---|---|---|---|---|
| First® TAIC-50GE |  | Triallyl isocyanurate | EPDM | As a bridging agent for polymers such as EPDM, EVA, CPE, CSM and POE, it can improve the bridging efficiency of cross-linking agents such as DCP and Bibp. In peroxide vulcanization system, hardness and tensile stress can be increased, compression deformation can be improved, vulcanization time can be reduced, and heat resistance of products can be improved; it is easy to operate, with no flying, and is easy to disperse. |
| First® TAIC-50P TAIC-70P |  | Triallyl isocyanurate | Inert inorganic matter | As a bridging agent for polymers such as EPDM, EVA, CPE, CSM and POE, it can improve the bridging efficiency of cross-linking agents such as DCP and Bibp. In peroxide vulcanization system, hardness and tensile stress can be increased, compression deformation can be improved, vulcanization time can be reduced, and heat resistance of products can be improved; it is easy to operate, and is easy to disperse. |
| First® TAC-50P |  | Triallyl cyanurate | SiO2 | As a crosslinking agent for trifunctional reaction, it can significantly improve the strength, rigidity and heat resistance of rubber and plastic products, and can make the products be used for a long time at about 250 ℃ . It is commonly used in rubber and cable industries; it can be used as vulcanization accelerator of highly saturated rubber to improve vulcanization effect; it can also be used as a photosensitizer for irradiation crosslinking of polyene to reduce the irradiation dose. |
| First® PL400-50GE |  | Trimethylolpropane trimethyl acrylate | EPDM | It is a bridging agent for peroxide vulcanization of EPDM, chloroprene rubber, silicone rubber, polyurethane, ethylene/vinyl acetate copolymer (EVA) and chlorinated polyethylene elastomer (CPE); it improves the corrosion resistance, aging resistance, hardness and heat resistance of products; it does not leak during processing, with no flying, and is easy to weigh and disperse. It plays a plasticizing role in mixing and hardening role in vulcanization; it can reduce radiation dose, shorten radiation time and improve crosslinking density. |
| First® PL400-50P PL400-70P |  | Trimethylolpropane methacrylate | Inert inorganic matter | It is a bridging agent for peroxide vulcanization of EPDM, chloroprene rubber, silicone rubber, polyurethane, ethylene/vinyl acetate copolymer (EVA) and chlorinated polyethylene elastomer (CPE); it improves the corrosion resistance, aging resistance, hardness and heat resistance of products; it does not leak during processing, with no flying, and is easy to weigh and disperse. It plays a plasticizing role in mixing and hardening role in vulcanization; it can reduce radiation dose, shorten radiation time and improve crosslinking density. |
| First® ZDA-70 |  | Zinc acrylate | EPDM | In peroxide vulcanization system, it can be used as a bridging agent to shorten the positive vulcanization time, obviously improve the crosslinking efficiency and crosslinking density of vulcanized rubber, and also improve the bonding performance with metal; when used as rubber reinforcing agent, it can obviously improve the hardness, flexibility and elasticity of products; it can also be used in rubber sulfur vulcanization system to improve tensile strength and flexural performance. |
| First® ZDMA-70 |  | Zinc dimethacrylate | EPDM | In peroxide vulcanization system, it can be used as a bridging agent to shorten the positive vulcanization time, obviously improve the crosslinking efficiency and crosslinking density of vulcanized rubber, and also improve the bonding performance with metal; when used as rubber reinforcing agent, it can obviously improve the hardness, flexibility and elasticity of products; it can also be used in rubber sulfur vulcanization system to improve tensile strength and flexural performance. |
| First® MgDA-70 |  | Magnesium acrylate | EPDM | It is a reinforcing agent and cross-linking agent in rubber materials, which can improve the thermal aging resistance and compression set of rubber vulcanizates with high sulfur and low sulfur and peroxide system, and can be used to make golf balls with high hardness and high elasticity. Usually, every increase of 1.5phr can increase the hardness by 1 degree, and it can be used for conveyor belts, cable sheathing, safety tires, golf balls and tank track pads. |





# Silane series

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® SI69-50E |  | Bis-(triethoxypropyl) tetrasulfide | EPDM/SBR | It is a multifunctional silane coupling agent for natural rubber and synthetic rubber which can improve the reinforcement of fillers including silica and light-colored fillers, improve the compatibility between fillers and rubber, improve the crosslinking degree, elastic modulus and tensile strength of rubber, significantly improve the wear resistance and compression deformation of rubber, and reduce the viscosity and energy consumption of rubber. It can prevent vulcanization and reduction, and enable rubber products to obtain good heat aging resistance. |
| First® SI172-50E |  | Vinyl tris (2-methoxyethoxy) silane | EPDM/SBR | It is a bifunctional molecule with both polar and nonpolar functional groups, which can react with both inorganic fillers and organic polymers. It can improve the tensile strength of rubber compound, increase the crosslinking density, reduce the compression permanent deformation and improve the comprehensive physical and mechanical properties of products; it is suitable for peroxide cross-linked rubber compound, with better thermal aging resistance. |
| First® SI69-50P SI69-70P Coupling agent |  | Bis-(triethoxypropyl) tetrasulfide | SiO2 | It is a multifunctional silane coupling agent for natural rubber and synthetic rubber which can improve the compatibility of fillers including silica, carbon black and light-colored fillers, improve the compatibility between fillers and rubber, improve the crosslinking degree, elastic modulus and tensile strength of rubber, significantly improve the wear resistance and compression deformation performance of rubber, and reduce the viscosity and energy consumption of rubber. It can prevent vulcanization and reduction, and enable rubber products to obtain good heat aging resistance. |
| First® SI172-50P SI172-70P Coupling agent |  | Vinyl tris (2-methoxyethoxy) silane | SiO2 | It is a bifunctional molecule with both polar and nonpolar functional groups, which can react with both inorganic fillers and organic polymers. It can improve the tensile strength of rubber compound, increase the crosslinking density, reduce the compression permanent deformation and improve the comprehensive physical and mechanical properties of products; it is suitable for peroxide cross-linked rubber compound, with better thermal aging resistance. |

## Film release agent/release agent

| Trade name | Appearance | Chemical composition | Characteristics and applications |
|---|---|---|---|
| First® ZAT-98 |  | Zinc stearate, water, emulsifier | It is suitable for anti-sticking and isolation in the production and processing of all kinds of rubber and rubber compounds. |
| First® ZAT-95 |  | Colorless transparent emulsion | It is suitable for anti-sticking and isolation in the production and processing of various rubber and rubber compounds. |
| First® CAT-98 Separant |  | Fatty acid calcium soap emulsifier, water | It is suitable for anti-sticking and isolation in the production and processing of various rubber and rubber compounds. |
| First® FSM-100 External demoulding agent | NEW  | White emulsion | This product uses the characteristics of silicone siloxane, such as strong hydrophobicity, large contact angle with water, good oxidation resistance, low surface tension, high chemical stability, non-toxicity, non-irritation, no skin allergy, and insolubility with rubber and plastic, to achieve the functions of isolation, smoothness and smoothness. It is an ideal release agent and isolation agent in the production and processing of rubber, plastic and other polymer materials. |

## Elastomer alloy series

| Trade name | Appearance | Chemical composition | ML1+4, 100℃ | Characteristics and applications |
|---|---|---|---|---|
| First® FST-1023 |  | Elastomer alloy | 35 | It has soft touch, resilience, high elongation, high toughness, excellent low temperature resistance, high slip resistance, good wear resistance, weather resistance and aging resistance; it also has excellent shock resistance, impact resistance, creep resistance and local oil resistance; it has high cohesive strength, good toughening and modification; it is widely used in EVA, EPDM, NBR/PVC and other molded and extruded foam products (sports equipment, thermal insulation foam pipes, thermal insulation cotton, rubber racetracks, high-grade EVA foam soles, etc.). |
| First® FST-1028 |  | Elastomer alloy | 25 | It has soft touch, resilience, high elongation, high toughness, excellent low temperature resistance, high slip resistance, good wear resistance, weather resistance and aging resistance; it also has excellent shock resistance, impact resistance, creep resistance and local oil resistance; High cohesive strength, good toughening and modification; it is widely used in EVA, EPDM, NBR/PVC and other molded and extruded foamed products. (Sports equipment, thermal insulation foam tube, thermal insulation cotton, rubber track, high-grade EVA foam outsole, etc.) |





## Light color antioxidant

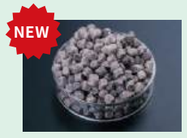
| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® TPC |  | Special ethers and acetals of olefin double bonds | EPDM | It is a special high-efficiency antioxidant for rubber, which is suitable for natural rubber and synthetic rubber. It can inhibit ozone aging and thermal oxidation aging under harsh hot and humid conditions, especially effectively prevent rubber products from frosting and whitening; it is colorless, non-migratory, pollution-free, non-toxic, low odor and is easy to disperse. The defect of low effect and pollution of that existing antioxidant in light-colored products are well solved. |
| First® TPM |  | It is a combination of mercaptobenzimidazole and diphenylamine derivatives | EPDM | This product is used as an antioxidant for natural rubber and diene synthetic rubber; it has protective effect on oxygen, weather aging and static aging, and can also effectively protect against copper damage and overcome the adverse effects caused by excessive sulfur when products are vulcanized; this product can be used alone, and can also be used with other antioxidants, especially with TPC, which has good anti-oxidation, anti-ozone and anti-frost. It is easy to disperse, does not change color in sunlight, and has no pollution. |
| First® TPK-80 |  | 4.4'- bis (α. α-dimethylbenzyl) diphenylamine | EPDM | This product is a non-toxic, non-polluting, tasteless and light-colored amine antioxidant, which is suitable for aging of chloroprene rubber, acrylate rubber and polyether polyol caused by high heat and light. It has the characteristics of high molecular weight and low volatility, which makes its antioxidant durability obviously better than that of SP, 1010, BHT and other phenolic antioxidants. It is an ideal substitute for phenolic antioxidants. It has a good synergistic effect with sulfur-containing antioxidants. |
| First® MB-80 |  | 2-mercaptobenzimidazole | EPDM | It is a general medium antioxidant, which is widely used in natural rubber and synthetic rubber; it has good heat resistance when used in sulfur-free vulcanized rubber compound, and can also be used as chloroprene rubber vulcanization accelerator and heat sensitive agent of rubber compound, and can also be used together with other antioxidants (such as TPC,DNP, AP and other non-polluting antioxidants) to obtain obvious synergistic effect; it is easy to disperse, easy to weigh, with no flying, little bitter taste, with no discoloration in sunlight, and can be used in light and dark products (except rubber products that come into contact with food). |
| First® MBZ-70 |  | 2-mercaptobenzimidazole zinc salt | EPDM | It is a general medium antioxidant, which is widely used in natural rubber and synthetic rubber products; it has protective effect on oxygen, weather aging and static aging, and can also effectively protect against copper damage and overcome the adverse effects caused by excessive sulfur when products are vulcanized; it improves the adhesion between rubber compound and skeleton; it can be used alone or together with other antioxidants (such as TPC, DNP, AP and other non-polluting antioxidants) to obtain obvious synergistic effect. |

## Light color antioxidant

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® MMBI-70 |  | 2- mercaptomethyl | EPDM | It is a general medium antioxidant, which is widely used in natural rubber and synthetic rubber products. It has protective effects on oxygen, weather aging and static aging, and can also effectively protect against copper damage and overcome the adverse effects caused by excessive sulfur during product vulcanization. It can be used alone or together with other antioxidants (such as TPC, DNP, AP and other non-polluting antioxidants) to obtain obvious synergistic effects. |
| First® ZMMBI-70 |  | Benzimidazole | EPDM | It is a general medium antioxidant, which is widely used in natural rubber and synthetic rubber products. It has protective effect on oxygen, weather aging and static aging, and can also effectively protect against copper damage and overcome the adverse effects caused by excessive sulfur during product vulcanization, and improve the adhesion between rubber compound and skeleton. It can be used alone or together with other antioxidants (such as TPC, DNP, AP and other non-polluting antioxidants) to obtain obvious synergistic effect. |
| First® SP-B |  | 2- mercaptomethyl benzimidazole zinc salt | SBR | This product is a moderate non-polluting antioxidant, which has a good protective effect on heat aging, flex resistance, light resistance and weather aging. It is used for natural rubber, cis-butadiene rubber, styrene-butadiene rubber, chloroprene rubber, nitrile rubber, butyl rubber and other light-colored rubber products, as well as polyolefin, polyoxymethylene and other plastic products. It has no discoloration, no pollution, no frost spraying and is easy to disperse. |
| First® SP-P SP-C |  | Styrenated phenol | SIO2 | This product is a moderate non-polluting antioxidant, which has a good protective effect on heat aging, flex resistance, light resistance and weather aging. It is used for natural rubber, cis-butadiene rubber, styrene-butadiene rubber, chloroprene rubber, nitrile rubber, butyl rubber and other light-colored rubber products, as well as polyolefin, polyoxymethylene and other plastic products. It has no discoloration, no pollution, no frost spraying and is easy to disperse. |
| First® TPL |  | Styrenated phenol | ≥131℃ | It is a polymeric hindered phenol antioxidant which is suitable for natural and synthetic rubber and its latex and butadiene compound. It is mainly used to protect the color stability and durability of polymers and rubber products; it has no obvious effect on the vulcanization characteristics of the compound. It has no pollution, with excellent extraction resistance. |
| irst® TPK |  | 4.4'- bis (α. α-dimethylbenzyl) diphenylamine | ≥95°C | This product is a non-toxic, non-polluting, tasteless and light-colored amine antioxidant, which is suitable for aging of chloroprene rubber, acrylate rubber and polyether polyol caused by high heat and light. It has the characteristics of high molecular weight and low volatility, which makes its antioxidant durability obviously better than that of SP, 1010, BHT and other phenolic antioxidants. It is an ideal substitute for phenolic antioxidants. It has a good synergistic effect with sulfur-containing antioxidants. |



## Dark antioxidant

| Trade name | Appearance | Chemical composition | Melting point | Characteristics and applications |
|---|---|---|---|---|
| First® TPA |  | High-efficiency anti-oxygen, anti-ozone agent and mixture of interface activation homogenizer and polymer. | / | It is an efficient anti-frosting antioxidant special for rubber can inhibit oxidation, thermal aging and weather aging under harsh conditions, and can effectively prevent rubber products from frosting; this product can reduce the Mooney viscosity of rubber compound, improve the processability and fluidity of rubber compound and increase the surface gloss of products; it can also be used with other antioxidants, such as TPM, with good synergistic effect. |
| First® RD |  | 2,2,4- trimethyl -1,2-dihydroquinoline polymer | 80-100°C | It is a general-purpose excellent amine antioxidant which is suitable for synthetic rubber (except NR and Cr), especially for rubber products with thermal-oxidative aging, and is often used with other antioxidants with excellent flexural fatigue resistance and ozone aging resistance to improve dynamic fatigue and ozone aging resistance; it can inhibit harmful metals. Compared with DNP, it has lower discoloration and coloring effect and lower pollution, so it is not suitable for light-colored products. |
| First® 4010NA |  | N- isopropyl -N'- phenyl p-phenylenediamine | ≥70°C | It is a general-purpose excellent amine antioxidant, which is especially suitable for SBR, NBR, CR, NR, BR and IR, with excellent protective effect on ozone and bending fatigue; it also has a good protective effect on general aging such as oxygen and heat; but also can inhibit the damage of harmful metals such as copper and manganese to rubber. It is often used to make rubber products with high dynamic and static stress. It has pollution and cannot be used in light-colored products. |
| First® 4020 |  | N-(1,3-dimethylbutyl) -N'- phenyl p-phenylenediamine | ≥ 44°C | It is a general-purpose excellent amine antioxidant with strong ozone resistance and oxidation resistance, with excellent protective effect on ozone cracking and flex fatigue aging, and gives rubber compound excellent high-temperature fatigue resistance and flex resistance. It has good water resistance and solvent extractability, and long-term protection. It has good dispersibility and softening effect in rubber compound, and has little effect on sulfur speed. It has pollution and cannot be used in light-colored products. |
| First® NDBC |  | Nickel N,N- di-n-butyl dithiocarbamate | ≥ 86°C | It is used as an anti-ozone agent in CR, CSM, CO, ECO, NBR, EPDM and other rubbers, which can effectively inhibit the cracking caused by exposure to ozone and sunlight when rubber products work dynamically; it has good oxidation resistance in common applications, can provide protection against thermal oxidation and weather resistance, and improve the sun resistance of EPDM and CSM vulcanizates and colored CR products. |
| First® TPB | NEW  | It is a compound of special amine antioxidant and imidazole salt | EPDM/ SBR | It is a derivative compound of special amines, ethoxyquinolines and imidazole zinc salts with a good inhibitory effect on heat, oxygen, ozone and harmful metals, and their migration, pollution and flooding phenomena are significantly reduced compared with those of 4010NA,4020 RD, etc. It is suitable for NR,SBR,NBR,EPDM and other rubber products, and the dosage is 1-5PHR. |

| Trade name | Appearance | Chemical composition | Melting point | Characteristics and applications |
|---|---|---|---|---|
| First®<br>MC |  | N-4<br>(anilinophenyl)<br>maleimide | | It is a reactive anti-aging agent which is suitable for NR and synthetic rubber seals and oil seals. In the vulcanization process, free radicals can be accepted to open the double bonds and form transverse bonds to cross-link with rubber, and under the initiation of peroxide, N-substituent derivatives can generate free radicals to cause graft polymerization and cross-linking, and the generated macromolecules are resistant to oil, high temperature, medium and aging, which can replace traditional high-temperature anti-aging systems (such as 445, NAPM,4010NA.4020, etc.), and the dosage is 1-3PHR. |
| First®<br>FST-FP100<br>Anti-blue agent | NEW<br>  | A compound of polyolefine derivative and special active agent | 无 | This product can effectively prevent the surface of rubber products from bluing, flooding, frosting and oil spraying caused by carbon black, antioxidant and softening oil, improve the appearance quality of products and keep them bright for a long time. It is suitable for rubber products such as NR,SBR,IR,BR,NBR,EPDM, etc. in sulfur and peroxide vulcanization system, with dosage of 2-6PHR. |





## Protective wax series

| Trade name | Appearance | Chemical composition | Melting point | Characteristics and applications |
|---|---|---|---|---|
| First®<br>ZT-660 |  | Microcrystalline wax | 62-66°C | It is widely used in various tires, conveyor belts and other rubber products. It has no effect on vulcanization speed, and can also improve the lubricity and processability of the compound. The anti-ozone cracking resistance of products under dynamic conditions can be significantly improved by adding anti-ozone agent. |
| First®<br>ZT-880 |  | Microcrystalline wax | 70-75°C | It is widely used in various tires, conveyor belts and other rubber products. It has no effect on vulcanization speed, and can also improve the lubricity and processability of the compound. The anti-ozone cracking resistance of products under dynamic conditions can be significantly improved by adding anti-ozone agent. It can effectively prevent or delay the surface atomization and spraying of rubber products caused by wax. |

## EVA product additives

| Trade name | Appearance | Chemical composition | Melting point | Characteristics and applications |
|---|---|---|---|---|
| First®<br>EFB-106<br>EVA antiwear agent |  | Trimethoxy γ-glycidyl ether oxy propyl silicone | EVA | It can effectively improve the wear resistance and tear strength of EVA compound; the reinforcement of the filler can be improved. This product is suitable for various foamed products of EVA or EVA combined with other rubbers. |
| First®<br>EFB-108<br>EVA antiwear agent |  | Trimethoxy γ-glycidyl ether oxy propyl silicone | EVA | It can effectively improve the wear resistance and tear strength of EVA compound; the reinforcement of the filler can be improved. This product is suitable for various foamed products of EVA or EVA combined with other rubbers. |
| First®<br>anti-shrinkage agent |  | Polymer calcium silane-based coating | / | It is mainly used as an anti-shrinkage agent for EVA, HDPE, PP, PS, ABS and engineering plastics and injection molded products; it can improve the smoothness of the skin of the product without concave-convex marks; it can solve the problem of uneven shrinkage of injection molded parts caused by cooling, obviously reduce shrinkage deformation, improve dimensional stability, especially for thick products with good resin compatibility, reduce intermolecular friction, shorten production cycle, and improve yield, without affecting various physical indexes of plastic products, which is pollution-free, environmental-friendly, non-toxic and harmless. |

# Other additives series

| Trade name | Appearance | Chemical composition | Polymer carrier | Characteristics and applications |
|---|---|---|---|---|
| First® CaO-80GE Dehumidifying defoamer |  | Calcium oxide | EPDM/ EVM | It is used in natural rubber and synthetic rubber; it can absorb the moisture in the rubber compound and eliminate the bad appearance caused by the moisture in the rubber compound; it can improve the bubble uniformity of foamed products and reduce the defective rate; it is suitable for atmospheric continuous vulcanization system, such as salt bath, microwave or hot air vulcanization. |
| First® CaO-90P Dehumidifying defoamer |  | Calcium oxide | / | Used in natural rubber and synthetic rubber; It can absorb the moisture in the rubber compound and eliminate the bad appearance caused by the moisture in the rubber compound; It can improve the bubble uniformity of foamed products and reduce the defective rate; Suitable for atmospheric continuous vulcanization system, such as salt bath, microwave or hot air vulcanization. |
| First® Ca(OH)2-70GE |  | Calcium hydroxide | EPDM/ AEM | It is used as a vulcanizing activator of natural and synthetic rubber, which can improve vulcanization speed; it is also used as an activator of fluororubber, with very low compression deformation; in styrene-butadiene rubber, its activity is higher than that of zinc oxide, except for thiuram and groove carbon black rubber. It can be widely used in reclaimed rubber to prevent blowholes. |
| First® RO-75GE Rubber deodorizer |  | Special porous regular silicate | EPDM/ EVM | It has excellent and unique functions of "adsorption effect" and "flame retardant and smoke suppression"; it can adsorb odor molecules in rubber and plastic products, deodorize, detoxify and deodorize, antistatic and other characteristics, significantly enhance the rigidity, toughness, surface gloss, thermal stability and dimensional stability of the products, and improve the rheological properties of the system; HCL can be absorbed in halogen-containing products, which can improve the flame retardant effect as a base material, and formaldehyde, ammonia, benzene, HCL and other toxic substances can be adsorbed in the air. |
| First® MgO-70 |  | Active magnesium oxide | EPDM/ AEM | It is an accelerator, activator and acid absorber for chloroprene rubber and fluororubber; it has the characteristics of high temperature resistance, fire resistance, flame retardancy, wear resistance and corrosion resistance. The product is odorless, tasteless, easy to disperse and easy to weigh; this product can be widely used in wires, cables and conveyor belts. |
| First® TiO2-80GE |  | Titanium dioxide | EPDM | In the rubber industry, it is not only used as a colorant, but also has the functions of reinforcement, anti-aging and filling; with EPDM as the carrier, the dispersion of titanium dioxide in the rubber compound is greatly improved by several special high dispersion processing techniques, avoiding agglomeration, with superior whiteness, blue phase, high weatherability, high hiding power, high luster, good fading resistance and no toxicity; rutile type. It has enhanced ozone resistance and ultraviolet resistance. |
| First® RB anti-slip agent |  | Butene modified derivatives | EPDM | It is suitable for rubber and EVA products such as NR,SBR,BR,NBR, etc. It can effectively improve the anti-slip performance of the products, overcome the balance between the anti-slip performance and wear resistance of the products, and also effectively improve the anti-ozone aging performance and prevent frosting on the surface of the products. |
| First® FST-RD120 Deodorizer |  | A compound of special chelating agent, active agent and complex | EPDM | It is a compound of special chelating agent, active agent and complex which can chelate with various harmful gases (such as toluene, xylene, formaldehyde, acetaldehyde, ethyl ketone, sulfur dioxide, hydrogen sulfide, ammonia, acetophenone, etc.) to effectively reduce or remove the odor of various rubber and plastic products, and the dosage is 2-5PHR. |
| First® FST-MG420 Lightweight agent |  | A microsphere with special polymer and silicate combination structure | EPDM | Based on the composition, special structure and coating of microspheres, this product can obviously and effectively improve the weight of products and reduce the material density in rubber, plastic and other products. When this product is added, the sulfur speed, hardness and tear strength of the rubber compound have little influence, and the specific gravity can reach 0.8-0.9. It is especially suitable for aerospace parts, automobile sealing strips, rubber hoses, shoe materials, sports equipment and other products that require light specific gravity, and the dosage is 3-15%. |





| Number | Item Number | Appearance | | Color | Packing | Properties and applications |
|---|---|---|---|---|---|---|
| 1 | FST-100 |  Yellow1% |  Yellow 4% | Yellow | 20KG/CTN | The color phase is slightly red but it is easier to vomit color. When the amount of addition is less than 0.2 %, its heat resistance is poor, so it is not recommended to use it in color matching. |
| 2 | FST- 101 |  Yellow 1% |  Yellow 4% | Yellow | 20KG/CTN | The color is bluer and its color vomit resistance is better than FST-100. It is a yellow pigment that widely used in rubber coloring and it does not apply to a small amount of color matching. |
| 3 | FST- 1002 |  Heat resistant yellow 1% |  Heat resistant yellow 4% | Heat resistant yellow | 20KG/CTN | Due to its good heat resistance, FST-1002 could be used for a small amount of color matching. |
| 4 | FST- 1005 |  Heat resistant yellow 1% |  Heat resistant yellow 4% | Heat resistant yellow | 20KG/CTN | With good light resistance and heat resistance, FST-1005 can be applied to colors of content below 0.2 %. |
| 5 | FST-103 |  Orange 1% |  Orange 4% | Orange | 20KG/CTN | FST-103 is widely used in rubber and basketball coloring products.If only use a small amount of FST-103, it will with poor heat resistance and not suitable for color matching. |
| 6 | FST- 104 |  Red 1% |  Red 4% | Red | 20KG/CTN | FST-104 is clear yellow in color and has poor heat resistance. It is an economical red coloring material. |
| 7 | FST- 105 |  Red 1% |  Red 4% | Red | 20KG/CTN | FST-105 has better heat resistance and light resistance than FST-104 and FST-106. When the amount of addition is less than 0.2 %, it is prohibited to use it. |
| 8 | FST-106 |  Red 1% |  Red 4% | Red | 20KG/CTN | FST-106 is the most widely used red for foaming boards. Due to the heat resistance is poor if only adding a small amount, it is forbidden to use it for adding less than 0.2 %. |
| 9 | FST- 1057 |  Pink 1% |  Pink 4% | Pink | 20KG/CTN | FST-1057 is bright and with good light-resistance and heat-resistance. It can be used for a small amount(below 0.2%)of color matching. |
| 10 | FST- 1057-1 |  Pink 1% |  Pink 4% | Pink | 20KG/CTN | FST-1057-1 is bright and with good light-resistance and heat-resistance. It can be used for a small amount(below 0.2%)of color matching. The concentration is 30 % lower than FST-1057.It's economic. |

| | | | | | | |
|---|---|---|---|---|---|---|
| 11 | FST-1081 |  Violet 1% |  Violet 4% | Violet | 20KG/CTN | FST-1081 is bright violet.Its light resistance and heat resistance are belong to upper levels. |
| 12 | FST-1091 |  Blue 1% |  Blue 4% | Blue | 20KG/CTN | Bright Sky Blue is a stable blue pigment. |
| 13 | FST-1102 |  Blue 1% |  Blue 4% | Blue | 20KG/CTN | Bright Sky Blue is a stable blue pigment. |
| 14 | FST- 111A2 |  Green 1% |  Green 4% | Green | 20KG/CTN | With good thermal stability,FST-111A2 can be used in any added ratio. It can also be combined with FST-1002 to form a bright green. |
| 15 | FST- 1002-1 |  Yellow1% |  Yellow 4% | Yellow | 20KG/CTN | FST-1002-1 is with good heat resistance, so it could be used for small amount of color matching. |
| 16 | FST-1005-1 |  Yellow1% |  Yellow 4% | Yellow | 20KG/CTN | With good light resistance and heat resistance,FST-1005-1 could be applied to color matching below 0.2 % |
| 17 | FST-1072 |  Red 1% |  Red 4% | Red | 20KG/CTN | FST-1072 is close to FST-106 in color.Due to its good heat resistance, it can be used for color matching. |
| 18 | FST -1072A |  Red 1% |  Red 4% | Red | 20KG/CTN | FST-1072A is close to FST-106 in color.Due to its good heat resistance, it can be used for color matching. |
| 19 | FST- 300 |  Blue 1% |  Blue 4% | Blue | 20KG/CTN | FST-300 is widely used in white materials and color matching. |
| 20 | FST- 300A |  Blue 1% |  Blue 4% | Blue | 20KG/CTN | FST-300A is widely used in white materials and color matching. |

| | | | | | | |
|---|---|---|---|---|---|---|
| 21 | FST-301 |  Brown 1% |  Brown 4% | Brown | 20KG/CTN | FST-301 is a bright color pigment with high temperature resistance. |
| 22 | FST-302 |  Brown 1% |  Brown 4% | Brown | 20KG/CTN | FST-302 is a bright color pigment with high temperature resistance. |
| 23 | FST-110A |  Blue 1% |  Blue 4% | Blue | 20KG/CTN | FST-110A is not stable and it may crystallize at high temperatures. |
| 24 | FST-5568 |  Red 1% |  Red 4% | Red | 20KG/CTN | FST-5569 is the most widely used red pigment in foaming boards.It has good heat resistance. |
| 25 | FST-2004 |  Fluorescent yellow 1% |  Fluorescent yellow4% | Fluorescent yellow | 20KG/CTN | FST-2004 is with good heat resistance and easy to disperse. |
| 26 | FST-2024 |  Fluorescent orange 1% |  Fluorescent orange 4% | Fluorescent orange | 20KG/CTN | FST-2024 is with good heat resistance and easy to disperse. |
| 27 | FST-2034 |  Fluorescent red 1% |  Fluorescent red 4% | Fluorescent red | 20KG/CTN | FST-2034 is with good heat resistance and easy to disperse. |
| 28 | FST-2044 |  Fluorescent pink 1% |  Fluorescent pink 4% | Fluorescent pink | 20KG/CTN | FST-2044 is with good heat resistance and easy to disperse. |
| 29 | FST- 2064 |  Fluorescent green 1% |  Fluorescent green 4% | Fluorescent green | 20KG/CTN | FST-2064 is with good heat resistance and easy to disperse. |
| 30 | FST- 2066 |  Fluorescent green 1% |  Fluorescent green 4% | Fluorescent green | 20KG/CTN | FST-2066 is with good heat resistance and easy to disperse. |

# Rubber masterbatch series

| Number | Item Number | Appearance | | Color | Packing | Properties and applications |
|---|---|---|---|---|---|---|
| 31 | FST- 307 |  1% Black |  4% Black | Black | 20KG/CTN | Do not migrate, do not spit blue light and with strong coloring concentration.FST-307 is an economical black pigment. |
| 32 | FST-307A |  1% Black |  4% Black | Black | 20KG/CTN | FST-307A is with features of high concentration,no migration and high coloring concentration. |
| 33 | FST-308 |  1% Black |  4% Black | Black | 20KG/CTN | FST-308 is with features of high concentration,no migration and high coloring concentration. |
| 34 | FST-801<br>FST-802<br>FST-803 |  1% Black |  4% Black | Black | 20KG/CTN | FST-801/802/803 is with features of high concentration,no migration and high coloring concentration. |



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