Introduction of rubber antiaging agent and its type and functions

Detail Introduction :

What is rubber anti-aging agent?

Rubber and its products in the long-term storage and use of the process, because of heat, oxyge variable metal ions, mechanical stress, light, high-energy rays, as well as other chemical substances erosion, will gradually become sticky, hard brittle or cracked. This decrease in physical and m properties and elasticity over time is called aging. With the aging process and development, the per of rubber and its products will gradually reduce to completely lose the use value. To this end, it is nec add some chemical substances in rubber and its products to improve its resistance to all kinds of delay or inhibit the aging process, so as to extend the storage period and service life of rubbe products, this kind of substance is called antiaging agent.

Antiaging agent classification by chemical structure, can be divided into the following 5 categories

1. Amine antiaging agent (subdivided into 6 categories: aldehyde amine antiaging agent, keto
antiaging agent, two aryl secondary amine, phenylenediamine, diphenylaniline, alkyl aryl secondary a
2. Phenolic antiaging agents (divided into monophenol, bisphenol, polyphenol)
3. Heterocyclic anti-aging agent
4. Phosphite ester anti-aging agent
5. Other types of antiaging agent (long-acting antiaging agent, nickel salt, wax, thiourea, newly d
antiaging agent)

Antiaging agent effect and representative products

1. Amine anti-aging agent

The most prominent protective effect, the most varieties. Main protective effects: thermal oxyg ozone aging, catalytic oxidation of hot heavy metals and ultraviolet light and fatigue aging have s protective effects. The protective effect of this kind of antiaging agent is incomparable to phenolic agent, far better than phenolic antiaging agent. Disadvantages: pollution, not suitable for white colored rubber products. The molecular structure of the stabilizer contains amino (NH2, - NH - a some varieties can directly generate carcinogenic substance, nitrosamines, some species c carcinogens produced, some varieties can also cause serious color rubber products, rubber some are easy to form a bloom phenomenon, at the same time have a polluting,Irritating to human body varying degrees. So this kind of product can only be used in dark or black rubber products. The main are: antiaging agent D (D), antiaging agent A (A), antiaging agent DNP, antiaging agent 4010NA/IPPD, agent 4020/6PPD, antiaging agent TMQ/RD, antiaging agent BLE.

1.1 Aldehydes and amines for aging. It is the reaction product of aliphatic aldehyde and primary amine. It is the oldest category of antiaging agent. Aldehyde amine antiaging agent is effective caused by heat, oxygen and light. There are anti-aging agents AH and AP.

1.2 Ketone amine antiaging agent. It has the best effect of anti-aging agent. There are: anti-aging aging AW, anti-aging BLE.

1.3 Diaryl secondary amine antiaging agent. This is one of the ancient varieties, A few days ago antiaging agents still ranked the first, antiaging agent D (D), antiaging agent A (A), antiaging agent DN

1.4 P-phenylenediamine antiaging agent. Including the most important kind of antiaging agent, b promising kind of antiaging agent. There are 4010NA/IPPD, 4020/6ppD, 4010/CPPD, ODA, DPPD, 7PI 3100/DTPD, 445.

1.5 diphenylamine antiaging agent. Fewer varieties, less outstanding performanc application. Diphenylamine itself is a good anti-aging agent, but it is very easy to volatilize, usually derivatives as anti-aging agent, the main varieties are 4, 4-dimethoxy diphenylamine, with ou performance of fatigue aging.

1.6 alkyl aryl secondary amine antiaging agent. This kind of antiaging agent is less polluting and ca for light-colored products, but the protection effect is poor. The main varieties are anti-aging agent D aging agent CMA.

Tyre

Shoes

Rubber Be

Rubber Gloves

Rubber Tape

Rubber W

2. Phenolic antiaging agents

Phenolic antioxidant protection and other stabilizer are not as good as amine stabilizer, only outstanding performance of the pollution, not change color, no pollution, no spray frost, but th protective protective effect in general, the price is expensive, little consumption, in Western Europe, antioxidant account for only 8.1% antiager, while China accounted for only 6%. Phenolic antiag molecular structure contains phenolic base, will not produce harmful substances to human body, b non-toxic additives, can be used in the food industry and contact with rubber products (animals), but of antiaging agent has peculiar smell, poor storage safety, easy to deteriorate conditions. Representative products are antiaging agent 2246, antiaging agent BHT (264), antiaging BHA.

3. Heterocyclic anti-aging agent (sulfur type)

It has good non-discoloration and good thermal oxidation resistance. It is best to be used with o aging agents. But there is a bitter taste, slightly pollution, large amount of easy to produce spray fro same time to vulcanization (in addition to chloroprene rubber) has delayed effect, belong environmental protection products, in the rubber industry, less consumption. There are anti-aging a anti-aging agent MMB, anti-aging agent MBZ, anti-aging agent MMBZ.

4. Phosphite ester anti-aging agent

It has good stability and thermal oxidation resistance, as well as certain plasticity, but it has certai odor and estrogen-like sex, and is also easy to spray frost, which is greatly limited in th industry. There is the anti-aging agent TNP. Phosphite hydroperoxide decomposers and free radical which play an auxiliary antioxidant role in polymer systems. They are mostly used with hindered phe rarely used alone.

5. Other kinds of anti-aging agents

5.1 Long-acting anti-aging agent. When rubber products are used in high temperature and environment, the antiaging agent in rubber will reduce or lose its protective effect be volatilization. And if rubber products are used in contact with liquid medium for a long time, they w or lose protective efficacy because of rapid extraction. For this development of non-volatile or low non-extraction or low extraction type of antiaging agent, according to the current open products ar diphenylamine (NDPA), allyl substituted phenol (TAP) and so on.

5.2 Nickel salt antiaging agent. There are anti-aging agent NDBC, anti-aging agent NDIBC, anti-ag NDMC. All green powder. With good ozone resistance and thermal oxidation resistance, expensiv nickel on the earth less storage, but a wide range of uses), but also a certain toxicity, deep color, easy frost, not suitable for light color rubber products, in the rubber industry consumption is very few.

5.3 Wax anti-aging agents. When the amount of the rubber in excess of the solubility in rubber, vulc is transferred to the surface, forming a layer of protective film, can effectively prevent static ozone products, paraffin wax, microcrystalline wax.

5.4 Thiourea antiaging agents. Thiourea organic thiourea derivatives were first used as vulcanizing p of oxygen-containing rubber in the rubber industry. With the application research, it is found that them have good anti-ozone aging properties on other rubber besides chlorine rubber. Thiourea agents have good ozone aging resistance and thermal oxidation resistance under dynamic a conditions, and can significantly improve the service life of rubber products. This kind of product is n tasteless, non-pollution, non-frosting, can be used in white or black products, belongs to the envir harmless green variety, especially suitable for light colored products and food, medicine, healt products, rubber industry has a huge market potential. Representative products are DBTU, DETU, b derivatives.

5.5 Newly developed anti-aging agent. Lactam derivatives, non-flexion (anti-flexion)LAS(LAS-P), s
triazine derivatives, 6-QDI, Durazone37 and other types