

Material Name: Aramid Fiber

Application Field

Aramid fiber is a new type of high-tech synthetic fiber, ultra-high strength, high modulus and high temperature resistant, acid and alkali resistance, light weight, excellent properties, such as 5 ~ 6 times that of steel wire on its strength, modulus of steel wire or fiber glass 2 ~ 3 times, toughness is 2 times of wire, and weight is only about 1/5 of the steel wire, the temperature of 560 degrees, don't break, don't melt. It has good insulation and anti-aging properties, and has a long life cycle. The discovery of aramid fiber is considered to be a very important historical process in the material world.

Aramid fiber is an important military material for national defense. In order to meet the needs of modern war, currently, the bulletproof jackets of developed countries such as the United States and the United Kingdom are made of aramid fiber. The lightness of aramid fiber bulletproof jackets and helmets effectively improves the rapid reaction ability and lethality of military forces. In the Gulf War, American and French aircraft used a large number of aramid composite materials. In addition to the military applications, as a high-tech fiber material has been widely used in aerospace, mechanical and electrical, construction, automotive, sporting goods and other aspects of the national economy. In terms of aviation and aerospace, aramid fiber saves a lot of power fuel due to its light weight and high strength. According to international data, during the launch process of spacecraft, every weight reduction of 1 kg means a cost reduction of 1 million US dollars. In addition, the rapid development of science and technology is opening up more new civil space for Aramid. It is reported that at present, about 7 ~ 8% of aramid products are used for flak jackets, helmets, etc., and about 40% are used for aerospace materials and sports materials. Tire skeleton material, conveyor belt material and other aspects of about 20%, and high strength rope and other aspects of about 13%.

Types and Functions of Aramid fiber: Para-Aramid fiber (PPTA) and interaromatic amide fiber (PMIA)

After the successful development and industrialization of aramid fiber by DuPont in the 1960s, in more than 30 years, aramid fiber has gone through the process of transition from military strategic materials to civilian materials, and its price has been reduced by nearly half. At present, foreign aramid fibers are maturing both in research

and development level and in scale production. In the field of aramid fiber production, para aramide fiber is the fastest growing, with its production capacity mainly concentrated in Japan, the United States and Europe. For example, Kevlar from Dupont, Twaron fiber from Akzo Nobel (merged with Teren), Technora fiber from TeREN of Japan, Terlon fiber from Russia, etc.

There are Nomex, Conex, Fenelon fiber and so on. Dupont of the United States is a pioneer in the development of aramid. It ranks first in the world no matter in the research and development of new products, production rules and market share. At present, its Kevlar fibers have more than 10 brands, such as Kevlar 149 and Kevlar 29, and each brand has dozens of specifications. Dupont announced last year that it would expand its Kevlar production capacity, and the expansion project is expected to be completed by the end of this year. Not to be outdone, well-known aramid production enterprises such as Di Ren and Hearst have expanded production or joined forces, and actively explored the market, hoping to become a new force in this sunrise industry.

German Acordis company recently developed high-performance ultrafine contrapuntal aron (Twaron) products, which neither burn nor melt, and have high strength and great cutting resistance, mainly used in the production of coated and uncoated fabrics, knitted products and needle felt and other high-temperature and cutting resistance of all kinds of textile and clothing equipment. The fineness of Twaron super thin silk is only 60% of that of the counterpoint arylon commonly used in occupational safety suits, and it can be used to make gloves. • Its anti-cutting ability can be improved by 10%. It can be used to produce woven fabrics and knitted products, with softer hand feel and more comfortable use. Twaron anti-cutting gloves are mainly used in automobile manufacturing industry, glass industry and metal parts manufacturers. They can also be used in the forest industry to produce leg-protection products and provide anti-damage equipment for public transportation industry. Twaron's fire retardant property can be used to provide fire brigade with protective suits and felt blankets, as well as high temperature operation departments such as casting, furnace, glass factory, etc., as well as production of fire retardant cladding materials for aircraft seats. This high performance fiber can also be used to create automotive tires, cooling hoses, V-belt and other machinery, optical fiber cables and bulletproof vests and other protective equipment, but also can replace asbestos as friction materials and sealing materials.

Market demand

According to statistics, the world total demand of aramid fiber is 360,000 tons/year in 2001, and will reach 500,000 tons/year in 2005. The global demand for aramid fiber is constantly increasing, and aramid fiber, as a new high-performance fiber, has entered a period of rapid development.

General aramid fiber colors:

