

Silk and It's Use

Properties of the silk

Silk contains 70-75% fibroin and 25-30% sericin protein. The biochemical composition of fibroin can be represented by the formula $C_{15}H_{23}N_5O_6$. It has the characteristic appearance of pure silk with pearly lustre. It is insoluble in water, ether or alcohol, but dissolves in concentrated alkaline solutions, mineral acids, and glacial acetic acid and in ammoniacal solution of oxides of copper. Sericin, a gummy covering of the fiber is a gelatinous body which dissolves readily in warm soapy solutions and in hot water, which on cooling forms a jelly with even as little as 1% of the substance. It is precipitated as a white powder from hot solutions by alcohol. Its chemical formula is $C_{15}H_{25}N_5O_8$. It can be dyed before or after it has been woven into a cloth. The weight in gram of 900m long silk filaments is called a denier which represents size of silk filament.

Silk has following peculiar properties:

1. Natural colour of Mulberry silk is white , yellow or yellowish green; that of Tasar brown; of Muga, light brown or golden; and of Eri, brick red or creamy white or light brown.
2. Silk has all desirable qualities of textile fibres, viz. strength, elasticity, softness, coolness, and affinity to dyes. The silk fibre is exceptionally strong having a breaking strength of 65,000-lbs/sq. inch.
3. Silk fibre can elongate 20% of original length before breaking.
4. Density is 1.3-1.37g/cm³.
5. Natural silk is hygroscopic and gains moisture up to 11%.
6. Silk is poor conductor of heat and electricity. However, under friction, it produces static electricity. Silk is sensitive to light and UV- rays.

7. Silk fibre can be heated to higher temperature without damage. It becomes pale yellow at 110° C in 15 minutes and disintegrates at 165° C.
8. On burning it produces a deadly hydrocyanic gas.

Use of silk

Silk is used in the manufacture of following articles

- Garments in various weaves like plain, crepe, georgette and velvet.
- Knitted goods such as vests, gloves, socks, stockings.
- Silk is dyed and printed to prepare ornamented fabrics for saris, ghagras, lehengas and dupattas.
- Jackets, shawls and wrappers.
- Caps, handkerchiefs, scarves, dhotis, turbans.
- Quilts, bedcovers, cushions, table-cloths and curtains generally from Erisilk or spun silk.
- Parachutes and parachute cords.
- Fishing lines.
- Sieve for flour mills.
- Insulation coil for electric and telephone wire.
- Tyres of racing cars.
- Artillery gunpowder.
- Surgical sutures.