

SUN PROTECTIVE TEXTILES - PART III

REF: TT/ APRIL 2019 / WK 4

UV Protection by chemical finishing

The UV finishing process is applied by conventional textile chemical finishing processes. This wet process takes place after dyeing and printing of fabrics when the base fabric has a poor inherent UV barrier property.

The chemical finishes that provide protection against UV radiation are mainly

- **Treatment with metal oxides** - The presence of TiO_2 , ZnO , CeO_2 , and Al_2O_3 particles in a fabric results in the scattering of UV rays and making the fabric less permeable to UV rays.

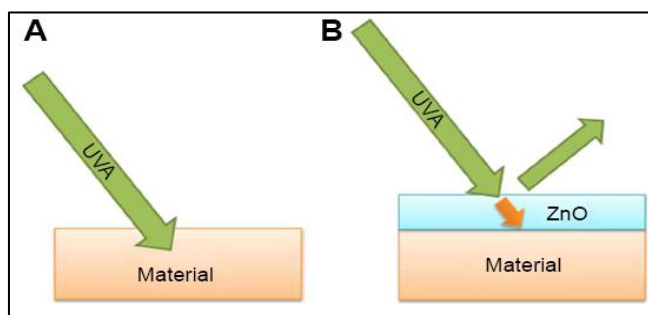
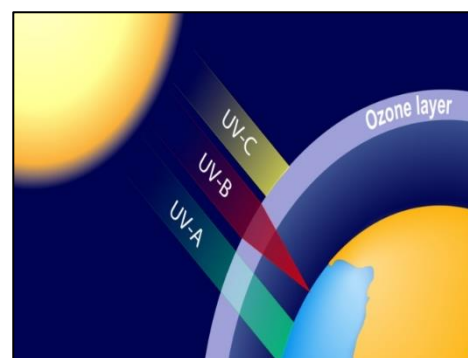


Fig 1.1 Penetration of UV rays (A) Without UV blockers (B) With UV blockers

- **Finishing with UV absorbers** - UV absorbers like Benzotriazole and Phenyl Benzotriazole, molecules can absorb UV rays of sunlight. These UV absorbers convert UV energy into harmless heat energy. This transformation is regenerative and can be repeated indefinitely. A UV absorber can be applied either during fibre manufacture or in the final fabric finish which gives the same degree of protection. By using UV absorbers, exposure of the fabric to UV lights, as well as the intensity of the transmitted UV light, is reduced.

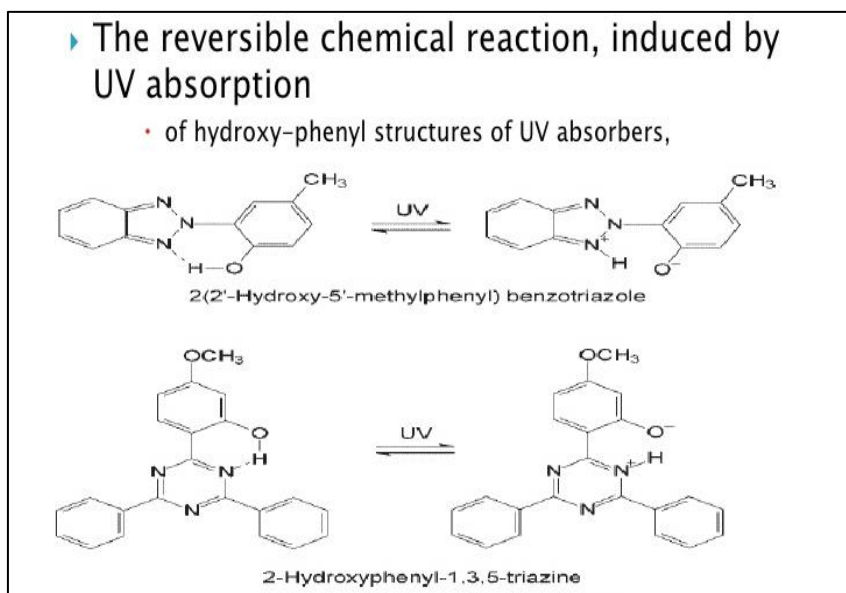


Fig 1.2 Chemistry of UV absorbers

What are SPF AND UPF?

SPF (Sun Protection Factor) - SPF is a measure of how sunscreen protects the skin from burning and is measured by timing, as to, how long skin covered with sunscreen.

UPF (Ultra Violet Protection Factor) - This terminology is used by the textile and clothing industry. UPF is based on a vitro test method and it is a ranking of the sun protective abilities of textile. It is the ratio of an average effective ultraviolet radiation irradiance calculated for unprotected skin to the average effective UVR irradiance calculated for skin protected by the test fabric. It is the quotient of the permitted radiation exposure relative to a minimum reddening of the skin in the protected area. The objective is to achieve factors between 30 and 50.

To be continued.....

Wishing you a great week ahead!

Technical Tuesdays is a knowledge sharing initiative by Resil Chemicals Private Limited
arc@resil.com | www.resil.com.