

WHAT IS XLA™ FIBER TECHNOLOGY?

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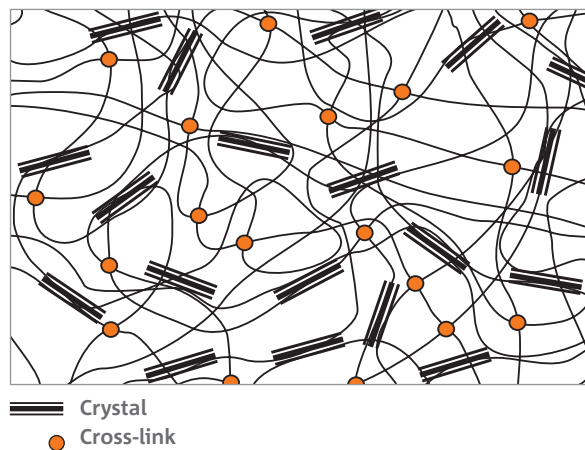
XLA™ fiber technology is a unique, elastic fiber that is olefin-based and designed for durable, comfortable stretch performance with excellent heat and chemical resistance.

Incorporating XLA fiber into fabrics offers unmatched opportunities for developing easy-to-handle, durable garments with improved shape retention.

How does XLA fiber technology provide comfortable stretch and maintain its shape?

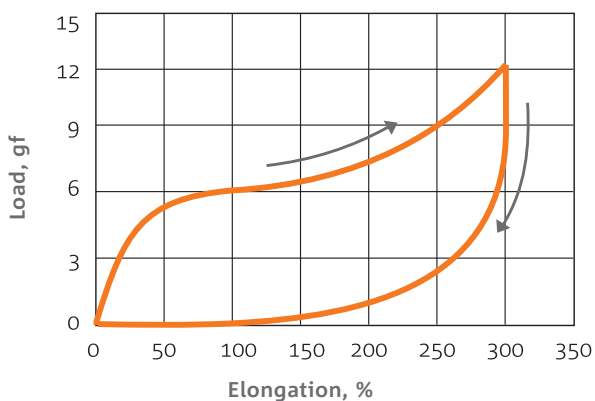
The special microstructure of XLA combines long, flexible chains with crystallites and covalent bonds or cross-links, forming an intricate network (Figure 1). Using Dow proprietary technology, the length of the chains and number of crystallites are specifically controlled to give XLA fiber a unique elastic profile. This is reflected in the fiber's load-elongation curve (Figure 2), which shows that high stretch is achieved with low levels of force, allowing garments to stretch and flex effortlessly and still return to their original shape. This unique elongation and recovery behavior results in clothing of such comfort that it becomes the preferred clothing of those who try it on.

FIGURE 1: MICROSTRUCTURE OF XLA FIBER



Covalent Cross-links Between Chains Deliver Extreme Heat Resistance

FIGURE 2: LOAD-ELONGATION RESPONSE AND RECOVERY FOR 70-DENIER XLA FIBER



Fabrics Based on XLA Fiber Offer A Natural Comfort Stretch

How does XLA fiber technology resist heat?

The cross-links formed in the fiber's molecular structure are the key to superior heat resistance. As the temperature increases, crystallites will gradually disappear and cross-links take over, keeping the network intact. After cooling to room temperature, crystallites will reform. This makes XLA very different from conventional melt-spun fibers, which rely on crystallites for both recovery and heat resistance. Figure 3 shows fibers at room temperature and after three minutes at 220°C. When the slide cover was slightly pressed, the degraded spandex fiber came apart, while the XLA fiber maintained its integrity.

Because XLA fiber can survive intense heat, it enables a greater range of processing for stretch fabrics and garments. High temperature thermosol dyeing, high pressure and high temperature jet dyeing of polyester (130°C), and high temperature or extended time-curing processes for functional finishes are now possible. Stretch fabrics enhanced with XLA can also withstand high temperature steam press (Hoffman Press), tumble-drying and medium or high ironing temperatures.

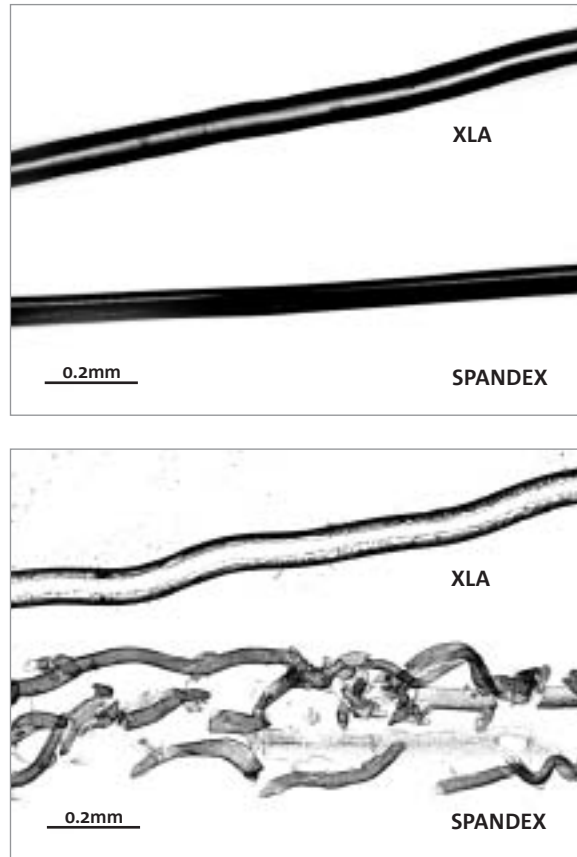
What happens when XLA is exposed to harsh chemicals or damaging UV light?

XLA fiber technology is based on olefin chemistry. And just like other olefin-based plastics — which can be used to make bottles for bleach and cleaners — the fibers are inherently resistant to chemical degradation.

Fiber test exposures were carried out in conditions closely simulating — or even more severe than — industrial processes such as no-iron finishing, mercerizing, and industrial laundering*. Under the stress of these harsh conditions, the fiber strength did not noticeably change. (Figure 4).

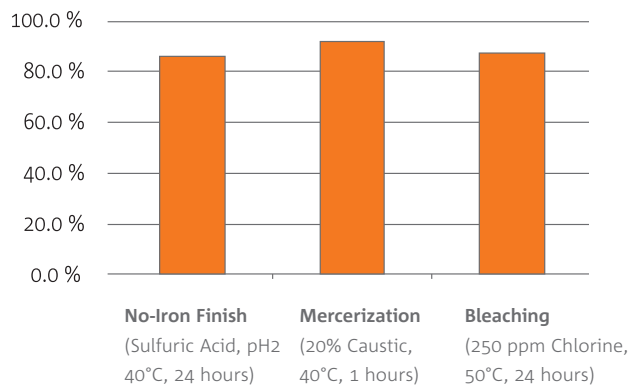
* Because olefins have an affinity to hydrocarbon solvents and mineral oils, XLA fiber should not be exposed to these classes of chemicals for extended periods of time.

FIGURE 3: HOT-STAGE PHOTOMICROGRAPHS OF 40-DENIER XLA FIBER AND SPANDEX



XLA Fiber Retains Thermal Stability Up to 220°C

FIGURE 4:



Managing the effects of UV light is in the best interest of everyone — from sunbathers to carmakers — and polymer scientists who want to minimize fiber degradation. To simulate the effects of these rays on fiber properties, samples were exposed to Xenon (AATCC Test Method 16E) and UV light (AATCC Test Method 186). Just as it wards off the effects of chemicals, XLA resists degradation caused by UV light (figure 5).

The chemical and UV light resistance of XLA fiber technology enable valuable processing advantages and offer excellent durability:

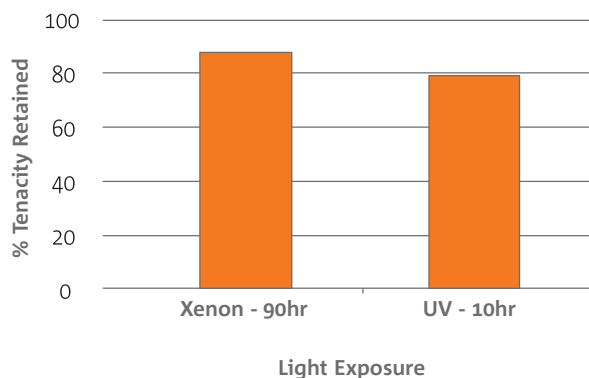
Broader fabric processing window: Resistance to chemicals allows for optimum processing conditions and enables the application of a wide variety of functional finishes.

More garment processing options: Chemical resistance enables aggressive garment processing like denim washes, no-iron garment dipping, and refurbishment via commercial laundering and dry-cleaning — even industrial laundering and the high-heat tunnel drying of uniforms.

UV/Xenon resistance opens new doors of opportunity to deliver stretch in end-use applications demanding top-notch performance such as activewear, industrial, and automotive.

XLA fiber technology is undeniably unique in its chemical properties and behavior. It has the ability to transform the way consumers look and feel by making comfortable, beautiful, easy-to-wear clothing essential to everyday life.

FIGURE 5: RESISTANCE OF XLA FIBER TO LIGHT DEGRADATION



XLA Fiber Retains a High Level of Tenacity After Exposure to Xenon and UV Light