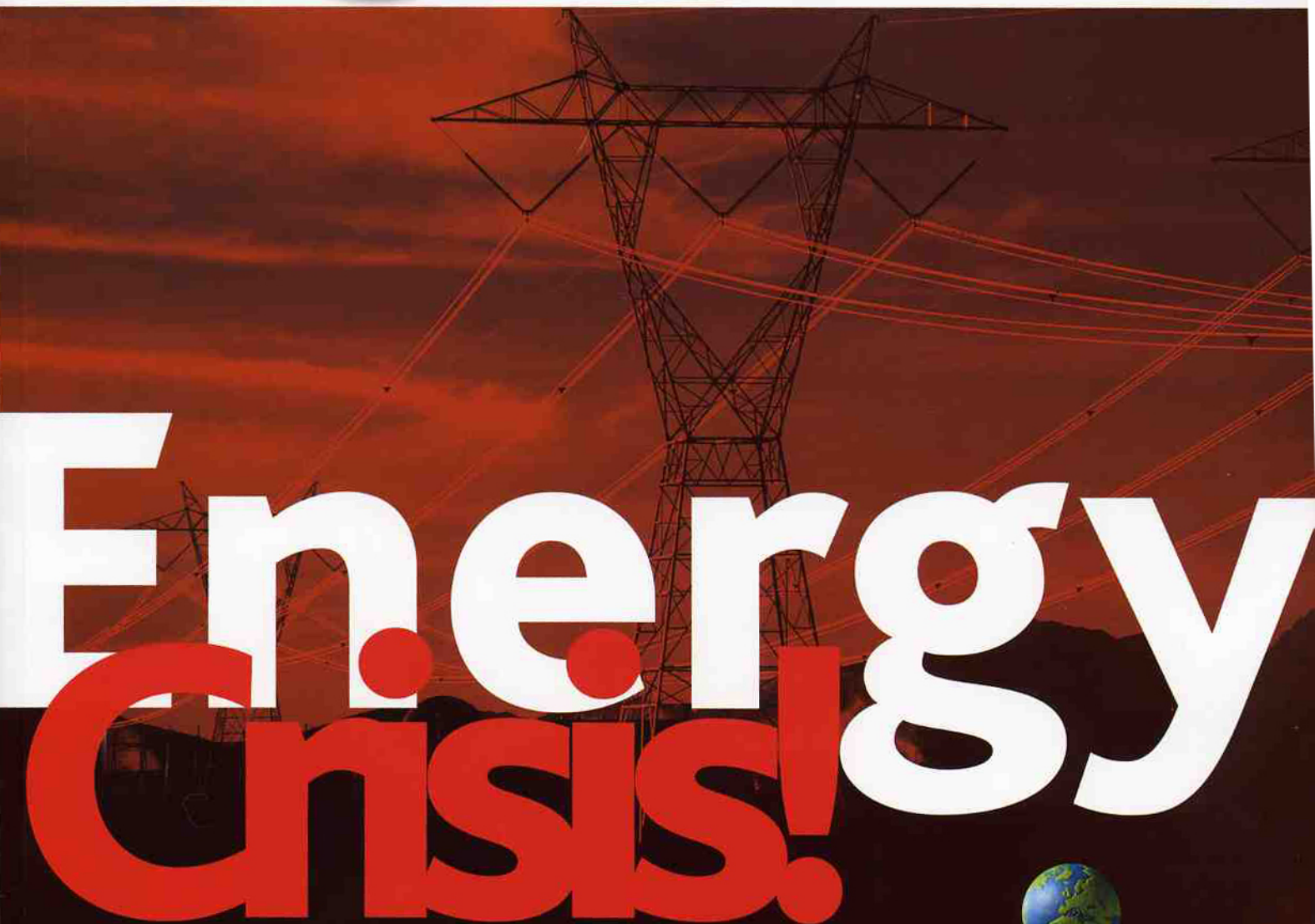


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# glass

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# Futuristic body armour

DALLAS POWELL OUTLINES THE BENEFITS OF A NEW CLOTHING MATERIAL THAT CAN BE WORN BY GLASS PLANT PERSONNEL

**S**upreme Corporation, a textile research and development company from the USA, has introduced Tuff-n-Lite, a new cut, slash and abrasive protective apparel that can be used in the glass industry.

Through a tremendous amount of thought and design, the Keel jacket was born. Tuff-n-Lite teamed up with glass factory workers and safety managers around the world to fine-tune the jacket for the industry. The company developed an exclusive process, making a very strong material with a tensile strength that is up to 15 times stronger than steel.

Tuff-n-Lite's composite blend of fibres and manufacturing process makes it almost three times more cut-resistant than apparel made

entirely of Kevlar, Twaron, Spectra or Dyneema. Tuff-n-Lite is also cool and breathable. Unlike aramids, Tuff-n-Lite doesn't lose its strength as quickly from the continual flexing and folding that apparel endures.

It can be cleaned and disinfected with chlorine bleach and household laundering chemicals without harm and won't lose its strength from exposure to most strong acids or bases. Its strength is also virtually unharmed from ultra-violet rays, either from the sun or inside lighting.

### BLEND OF FIBRES

Aramids can lose their strength for many of these reasons. Tuff-n-Lite had reports from glass factories that some people fainted from heat stroke while working, so the company formulated a yarn that is flexible,

comfortable and breathable. The blend of fibres wick away moisture and heat from the body and the knit construction allows air to pass through (it is possible to see through it when it is held up to a light).

Some of the glass factories were using woven aramid jackets, along with sleeves, arm guards, aprons and other items to gain the level of safety they needed



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for each task. This was quite expensive. Tuff-n-Lite resolved this issue by protecting the vital areas with a 2 1/2 inch collar and extended the length of the jacket and sleeves. The company also added a double layer forearm, which provides more protection than an aramid jacket and a cane wrist guard combined.

**ABRASION RESISTANCE**

Tuff-n-Lite is also more abrasion-resistant than aramids. The Martindale Abrader is used to determine abrasion resistance. It randomly orbits a piece of material with a sanding disc, dramatically increasing the timeframe that a piece of material will fail. On the Martindale Abrader, a swatch of pure aramid fibre fails at 180 cycles. Tuff-n-Lite lasted over 3000 cycles, resulting in outstanding abrasion resistance.

After only six laundering cycles with detergent and chlorine bleach, Kevlar loses 88% of its strength. According to outside sources, in laundering, aramids begin to lose their strength retention from acids with a pH of 4 or less, and from bases with a pH of 8 and higher.

To give an idea of these pH ranges, common household acids such as orange juice, tomatoes, strawberries, apple juice, cola, lemon or lime juice and vinegar all typically have a pH of 4 or less.

Bases with a pH of 8 and above are items such as egg whites, seawater, baking soda, most hand soaps, household ammonia, bleach, lye and drain cleaner. Laundry detergent ranges from an average of 8 for the liquids to an average of 10.5 for the powders.

**STRONG RESISTANCE**

Tuff-n-Lite has an overall strong resistance to acids, bases, detergents and chlorine bleach. It can be impregnated with Micro-Texpur, which permanently adds antimicrobial treatment lasting the life of the garment killing bacteria, providing protection from infections and minimising body odour.

Heat resistance is one area where aramids prevail. Aramids' strength degradation begins in the range of 800-900°F where Tuff-n-Lite has a melting point in the range of 280-305°F. The human body can't take that type of extreme heat for an extended amount of time. This would primarily be a factor for people working closely with molten glass where there is a risk of splatter. Tuff-n-Lite suggests its use to be in areas with continual temperatures of 194°F or below. ■



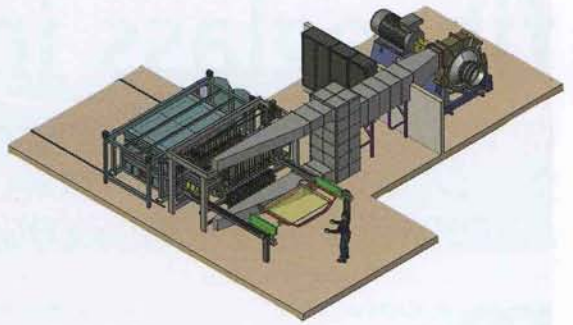
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