

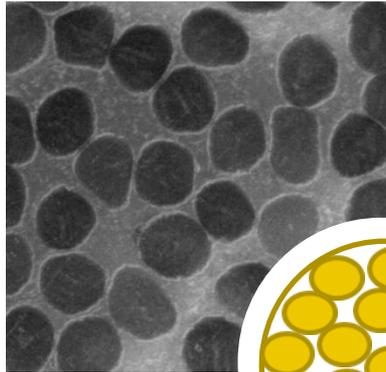
A pair of yellow protective gloves is shown against a dark, metallic background. One glove is positioned vertically, showing its wristband which has a black label with white text. The other glove is positioned horizontally in the foreground. The background features a circular opening and a small screw. The TEIJIN logo is visible in the top right corner.

TEIJIN

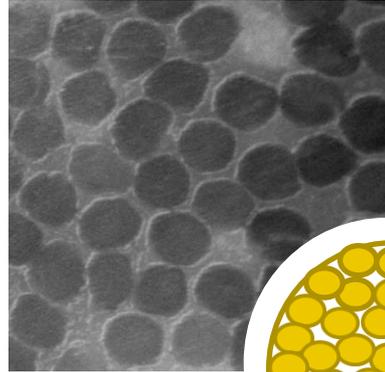
Advantages of Twaron® in protective gloves

More comfort combined with maximum protection

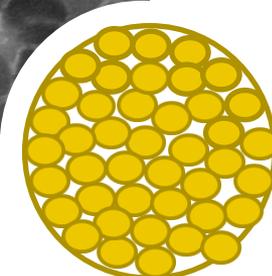
Typical yarn cross section



2.25



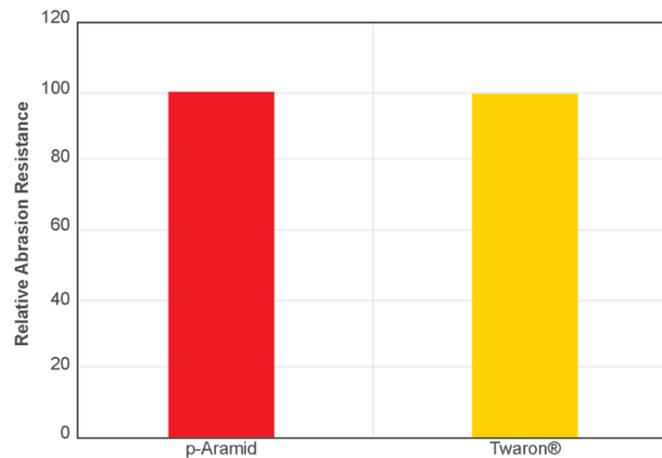
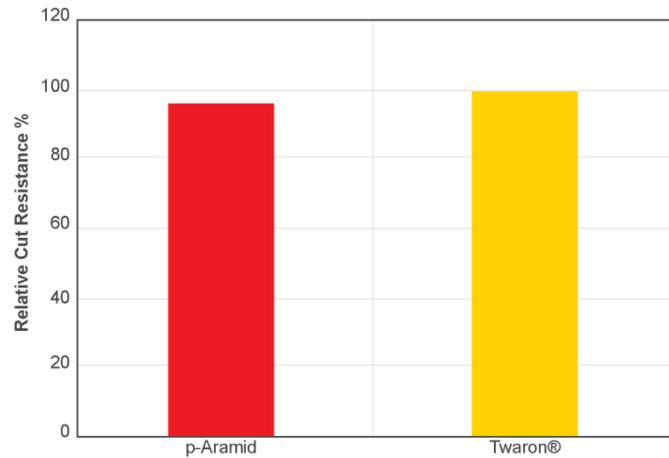
1.50



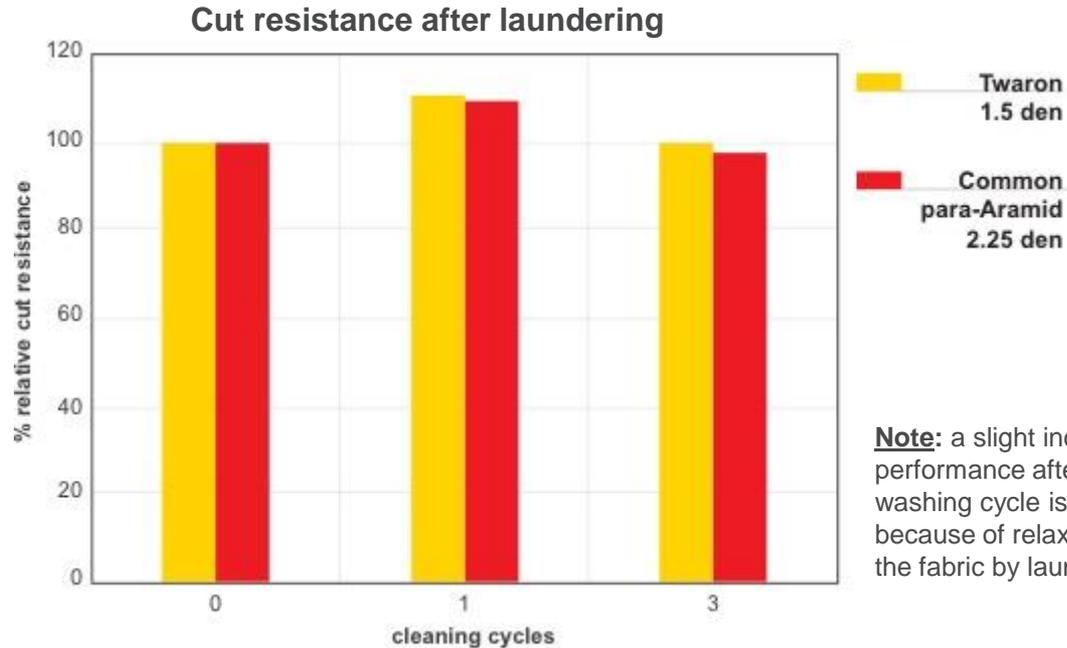
Teijin promotes a finer 1.5 denier Twaron fiber for use in protective gloves compared to 2.25 denier fiber commonly used in the market. A coarse fiber of 2.25 denier is stiffer compared to Twaron 1.5 denier fiber. To compensate for this, 2.25 denier para-aramid yarns are often spun having less twist which could result in a weaker yarn. The finer staple fiber in combination with a higher twist produces a tighter yarn bundle.

The benefit for the end user is a **longer lasting, more comfortable** product with maximum protective properties.

Comparative data cut/abrasion resistance common 2.25 denier versus Twaron 1.5 denier



Greater lifecycle - higher cost effectiveness



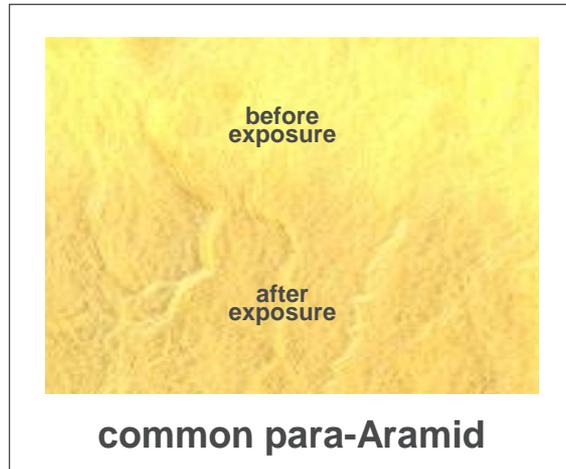
Note: a slight increase in performance after the first washing cycle is found, because of relaxation of the fabric by laundering

The life cycle of a glove depends on the daily use. During normal usage cuts, snags and abrasion may occur which may reduce the life cycle of a glove. If cleaned according to cleaning recommendations, Twaron gloves do not show any significant loss in cut or abrasion resistance.

Customers reported a greater life cycle compared to competitive products.

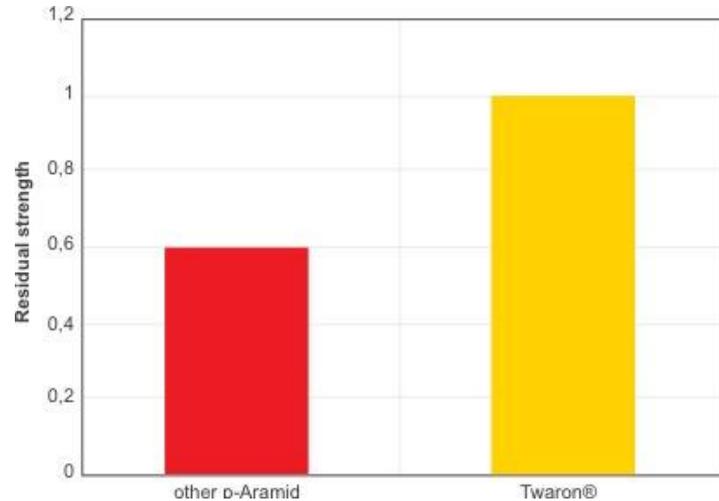
Maximum color retention, minimal UV degradation

Effect of exposure to UV light (Xenontester)
for 48 hours constant exposure



Due to its patented manufacturing process Twaron is showing less change of color after UV exposure. This visual perception builds confidence of inherent quality and performance characteristics.

Greater residual strength after outdoor exposure



Residual strength of material after outdoor exposure for one year compared to strength of Twaron after one year.

Fabric integrity will be **enhanced** with greater residual strength.

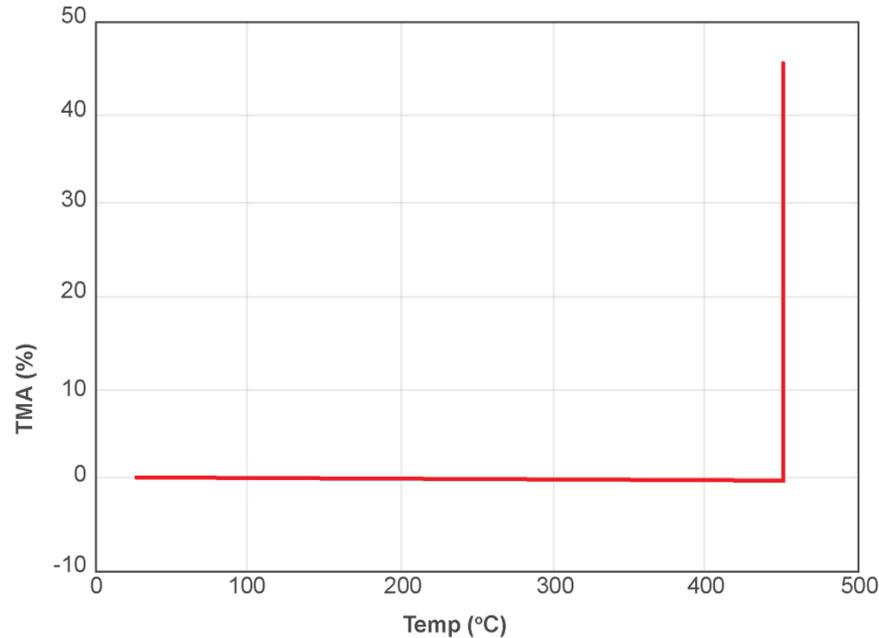


Thermal characteristics of Twaron



- Does not burn
- Does not melt or drip
- Decomposing starts at 450°C/ 842°F
- Has low heat shrinkage
- Retains dimensional stability at high temperatures
- Release little smoke under extreme conditions

Thermal characteristics of Twaron



Thermal decomposition of Twaron starts at 450°C/ 842°F and is very sharp.

No decomposition or evaporation of dangerous gases/substances below this temperature.

TMA% = Thermo-Mechanical Analysis explains the fibers thermal decomposition temperature.

Characteristics of most common glove materials

PRODUCT	HEAT RESISTANCE	CUT RESISTANCE	ABRASION RESISTANCE
Cotton	+	++	+
Leather	+++	+	++
Nylon (Polyamide)	++	++	+++
Polyethylene (UHMW-PE)	+	+++	++++
Polyester	++	+	+
Twaron® (para-Aramid)	++++	++++	+++

If a combination of heat, cut and abrasion resistance is required, para-aramid such as Twaron® is the choice material



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**Thanks for
your attention**

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