Unitex® squeegees
printing for the long run
A history of excellence

Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative engineered solutions accelerate performance for customers in a sustainable way. The Trelleborg Group has local presence in over 40 countries around the world.

Trelleborg Applied Technologies is part of the Trelleborg Group. At our manufacturing facility in the UK we produce high quality engineering polymers within polyurethanes and synthetic rubbers, as well as a range of innovative energy control materials. We have over 55 years manufacturing experience and are certified to ISO 9001 and ISO 14001.

We supply our products worldwide, through our experienced sales team and distributor partners. Our success comes from us providing technical solutions, being flexible, offering free technical advice as well as first class after-sales support.

Unitex® screen printing squeegees is an established brand within Trelleborg Applied Technologies product portfolio. It has earned a deserved reputation for providing industry leading performance and exceptional quality. As part of an ongoing development programme, Unitex® remains at the forefront in squeegee technology. The Unitex® squeegee range covers the full breadth of screen printing applications. Unitex®, Ulon® and Marathon® are all trademarks of Trelleborg.

Member of:

FESPA Federation of European Screen Printers Associations
SGIA Speciality Graphic Imaging Association
CPSIA China Speciality Graphic Imaging Association

ISO 9001 Registered Quality Management
ISO 14001 Registered Environmental Management
Market leading screen printing squeegee
What makes Unitex® screen printing squeegees the best:

**Excellent print quality and accuracy**
- Ultra sharp printing edge that provides exceptional print quality and accuracy
- Consistently sharp printing edge which is capable of depositing printed layers accurately between 70µm and 10µm (microns)
- Reduce ink usage and screen breakages

**Extended print runs**
- Extremely low chemical absorption from modern ink systems
- Eliminates/significantly slows down the risk of squeegee deformation
- Longer print runs and less downtime

**Longer Squeegee life**
- Exceptional abrasion resistance
- Significantly reduces high squeegee usage and additional downtime that can result from low cost squeegees
- Very cost effective - long predictable squeegee life/significant reduction in scrap

**Quicker set up timeset**
- Unrivalled quality and industry leading tight dimensional tolerances - every squeegee is physically and mechanically tested
- Consistent quality ensures the squeegees are fit for purpose every time
- Drastically reduces additional printing setup time that can result from poor quality squeegees

**All applications covered**
- The Unitex® squeegee range covers the full breadth of screen printing applications including:
  - Electronics
  - Graphics
  - Textiles
  - Glass
  - Bottles/Containers
  - Solar Cells

**Cost Versus Benefit**

Unitex® Squeegees can offer up to a 47% cost saving on your ink usage

Independent tests carried out – report available on request
Specialist squeegees for screen printing professionals

As one of the original squeegee polyurethane manufacturers, we have a wealth of experience and expertise in processing squeegee materials. In addition to making standard squeegees we are also experts in making composite squeegees. We only use the best virgin raw materials and we do not use fillers or plasticisers.

Unitex® Ulon HP

Unitex® Ulon HP squeegee range provides optimum performance for the most demanding screen print application.

It is made from NDI (Naphthalene Diisocyanate) technology, which provides the highest level of chemical and abrasion resistance. Widely recognised as the best squeegee in solvent based, plastisol and water based inks. Offers exceptional wear and tear resistance.

* Ideal for high precision/value printing applications such as electronics, solar cells and glass

Advantages
- Maintains the printing edge and durometer under harsh conditions
- Sharper printing edge
- Long squeegee life – optimum abrasion resistance
- Does not wear screens
- Consistent product quality and tight dimensional tolerances

Shore A° - Durometer - Colour Coding

<table>
<thead>
<tr>
<th>Shore A°</th>
<th>Durometer</th>
<th>Colour Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>60°</td>
<td>55-60°</td>
<td>YELLOW</td>
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<tr>
<td>65°</td>
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<td>FAWN</td>
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<tr>
<td>90°</td>
<td>85-90°</td>
<td>PINK</td>
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</table>

Unitex® Marathon

Unitex® Marathon provides premium screen printing performance and quality at a competitive price.

It is made from MDI (Diphenylmethane Diisocyanate) technology. Designed to give superior resistance to degradation by commonly used inks, solvents and monomers used in modern printing processes.

* Ideal for decorative/personalised printing applications such as textiles, graphics, bottles and containers

Advantages
- Low swelling characteristics to solvent cleaners and inks
- Ideal for UV ink systems
- Long squeegee life – good abrasion resistance
- Does not wear screens
- Consistent product quality and tight dimensional tolerances

Shore A° - Durometer - Colour Coding

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<td>75°</td>
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<td>75-80°</td>
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<td>85°</td>
<td>80-85°</td>
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<td>90°</td>
<td>85-90°</td>
<td>WHITE</td>
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* There is cross over between the ranges depending on the application, please contact us directly if you need help specifying the best Unitex® Squeegee for your application.
## Technical data

### Unitex® Ulon HP

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Plain Section</th>
<th>Tolerance</th>
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</thead>
<tbody>
<tr>
<td>Length</td>
<td>Up to 3750mm (147&quot;)</td>
<td>+/- 10mm</td>
</tr>
<tr>
<td>Width</td>
<td>15 - 50mm (0.6 - 2&quot;)</td>
<td>+/- 0.5mm</td>
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<td></td>
<td>50 - 100mm (2 - 4&quot;)</td>
<td>+/- 1mm</td>
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<tr>
<td>Thickness</td>
<td>up to 12.5mm (0.5&quot;)</td>
<td>+/- 0.4mm</td>
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<tr>
<th>Dimensions</th>
<th>Triple Section</th>
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<tr>
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<td>15 - 50mm (0.6 - 2&quot;)</td>
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<td>50 - 100mm (2 - 4&quot;)</td>
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<tr>
<td>Thickness</td>
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### Unitex® Marathon

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### Technical Data - Unitex® Ulon HP 500/4 70-75º Shore A (Durometer)

<table>
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<tr>
<th>Properties</th>
<th>Values</th>
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<th>British Standard</th>
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<td>Tensile modulus at 200% elongation</td>
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<td>%</td>
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<td>Abrasion weight loss (mg)</td>
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<td>(mg)</td>
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### Technical Data - Unitex® Marathon GREEN 75º Shore A (Durometer)

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<th>Properties</th>
<th>Values</th>
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<tbody>
<tr>
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<td>Tensile modulus at 200% elongation</td>
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<td>Tensile modulus at 300% elongation</td>
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<td>Tear resistance (initiated tear)</td>
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<td>KN/m</td>
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<tr>
<td>Specific gravity</td>
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<td>Abrasion weight loss (mg)</td>
<td>13.4</td>
<td>(mg)</td>
<td>BS 903:A9:1988</td>
</tr>
</tbody>
</table>

Unitex® Squeegees are now even longer

Even better value for money
All screen printing applications covered

Glass
Automotive - Architectural
- A high value finished product demands a high quality squeegee for perfect results and reduced product defects
- Unitex® Ulon HP is an excellent squeegee for screen printing onto glass substrates using enamels which are fired permanently into the surface of the glass. It is also ideal for the frequently abrasive cold ceramic ‘Frit’ waterbased inks used in architectural glass applications
- Unitex® Ulon HP Composite 500/1 (55-60º Shore A) hardness is ideal when a large amount of ink is required onto the substrate with good tip control - see page 8 for more information on our Composite range
- Unitex® Ulon HP 500/4 (70-75º Shore A) hardness when the definition detail is fine

Graphics
Plastic - PVC - Decals - Vinyl - Paper - Packaging Labels
- For printing graphics the squeegee must have the right amount of flexing to transfer ink correctly through the screen and have good solvent/UV ink resistance. Also, it must be free from surface imperfections and irregularities, especially for high quality graphics
- Typically for high resolution graphics a 75º Shore A (or harder) squeegee is used
- Many printers use the Unitex® Marathon Triple 75º Shore A or higher when high print pressure is required to ensure fine detail. As it is a multi purpose squeegee can be used on many different types of machines which cuts down on inventory - see page 8 for more information on our Triple range
- Generally lower hardness squeegees are used for larger mesh openings

Bottles and Containers
Plastic - Glass Packaging
- Unitex® Marathon S-Cut and D-Cut squeegees play an important role in meeting the increasing demands on the bottle printer. S-Cut and D-Cut profiles provide the benefit of a sharper edge for an accurate ink deposit, in addition to maximum definition
- For greater tip control use S-Cut and D-Cut profiles with Land indicates a flat tip which is normally 1mm
- The profiles are available in 45° and 65° angles - see page 9 for more information on our profiles
**Solar Cells and Electronics**

Cell Busbars - Fingers - PCB - Battery - RFID - Insulators - OLED - Bio Sensors - Thick-Film - Thin-Film - Switch Membrane

- A high value finished product demands a high quality squeegee for perfect results and reduced product defects. Unitex® Ulon HP is the squeegee of choice for numerous electronics manufacturers worldwide.
- Unitex® Ulon HP squeegee is ideal for multi layer printing where tight registration control and printing accuracy is essential.
- For fine track spacing and deposits in 20µm to 30µm range use Unitex® Ulon HP 500/4 (70-75º Shore A) and 500/8 (75-80º Shore A) hardness. For deposits 50µm+ use Unitex® Ulon HP 500/3 (65-70º Shore A) hardness.
- Used with inks, pastes, resins etc.
- Unitex® Ulon HP is OEM on many of today's Electronic Printing Machines.
- Unitex® Ulon HP is fully RoHs compliant.

**Textiles**

Most Substrates - Decorative/Personalised Printing

- Screen printing can cope with intricate designs on silk through to durable bold prints on a wide range of fabric based substrates. Inks range from water or solvent based pigments and dyes to plastisol types.
- Textiles such as T-shirts often require a large amount of ink deposited, so a softer squeegee is required such as Unitex® Marathon 60 and 65º Shore A.
- For finer meshes, increase the hardness of the squeegee to reduce ink deposited and increase detail.
- If a very heavy ink deposit is required use a Bull Nose profile - see page 9 for more information on our profiles.

**CD/DVD**

Screen Printing

- The CD/DVD industry require squeegees with high durability, close tolerances and a wide range of sizes.
- The print quality must be high with maximum definition and machine set up times kept to a minimum.
- Unitex® Ulon HP and Unitex® Marathon are available in a range of sizes, from length 100mm to 160mm and width 20mm to 35mm.
- They are both ideal for high speed printing applications and one to five colour processes.
Guide to selecting the right Unitex® squeegee

Hardness/Durometer

The hardness of squeegees is measured in Shore A° (Durometer) usually covering a range of grades from 55° to 95° as a means of identification for the industry. Unitex® uniquely offers strict 5° hardness bands, and guarantees the printer a more repeatable performance. Although hardness plays a dominant role in a blade's deformation and wear, the elastic modulus of the squeegee controls the stiffness or amount of flexing or bending.

Many squeegee manufacturers may produce blades with the same hardness, but the elastic modulus can differ from one producer's squeegee to another. This can have a marked effect on performance. Unitex® squeegees are manufactured to tight specifications thus minimising print variables. The hardness value influences the way the squeegee aligns to the surface and determines the level of printing force required to achieve the transfer of ink through the screen. The softer the grade the more adaptable the squeegee is to the surface - as a result less printing force is required.

The chart recommendations are for standard pressures, medium stroke of printing speeds and standard squeegee angles. It does not cover squeegees which are swollen or damaged through misuse or wear, or to squeegees which are outside the manufacturer's dimensional specification.

Choosing the hardness

There are generally three broad categories of hardness, which includes soft, medium or hard. Ranging from 55° to 95° Shore A° in 5° increments.

Soft Grades

Unitex® Ulon HP 500/1 500/3
Unitex® Marathon 60° 65°

Generally used for medium squeegee pressure with large mesh opening and low viscosity inks. They are ideal for irregular substrates and uneven beds. In general, softer squeegees will deposit a high amount of ink with medium detail control. Ideal for use with large coloured surfaces and glazes, as well on to glass and ceramics.

Medium Grades

Unitex® Ulon HP 500/3-4 500/4
Unitex® Marathon 70° 75°

Ideal for higher squeegee pressure with a wide range of mesh count and inks. Will give good ink deposit and fine detail control. They are used for most screen printing applications.

Hard Grades

Unitex® Ulon HP 500/8 500/9 101/9 500/15
Unitex® Marathon 80° 85° 90°

Used for maximum squeegee pressure and high viscosity inks. Gives lower ink deposit and good, fine detailed control. They are mainly used for fine mesh screens and thin ink layers.
Unitex® Ulon HP/Marathon
Dual and Triple Range

The Dual and Triple hardness range of squeegees have a unique chemically laminated designed blade.

Generally of a soft/hard and soft/hard/soft construction. These squeegees are designed to overcome the problems normally associated with applying too much pressure with a soft or medium hardness blade.

At high pressure, softer blades will distort, considerably decreasing the attack angle and drastically reducing the ability of the squeegee to shear the ink correctly. The blade may then aquaplane over the surface leaving ink on the screen. The harder section of these blades prevents bending under high pressure and the softer layer gives the perfect print.

Unitex® Ulon HP
Composite Range

The Unitex® Ulon HP range of Composite squeegees complements our range of Plain and Angled squeegees. They have proved to give excellent results on high speed machines in applications such as flat glass, solder paste as well as giving consistent film thickness on multi colour and UV lacquer products.

Advantages Include:
• Prevents blade distortion
• Less vibration
• Reduced screen pressure
• Increases stencil and mesh life
• Less screen stretching
• Excellent ink control
• Stability without distortion
Choosing the right profile

Plain
Standard rectangle profile - most commonly used profile for general graphics and textiles. Can be used on a variety of substrates with a wide range of inks. Provides medium adaptability and maximum force. Pushes the smallest amount of ink through the screen. Ideal for sharp line and halftone dot production. The less ink deposited the sharper the printed image.

D-Cut and D-Cut with Land
D-Cut - V-shaped profile with a sharp tip.
D-Cut with Land - V-shaped profile with flat tip.

Gives excellent control when printing on glass or plastic cylindrical objects. The Land version gives good control of printing angle. Also used for fine printing on textile cloth.

- Profiles are available in 45˚ and 62˚ angles.
- All Lands are normally 1mm.

Bull Nose
Rounded Bull Nose profile - Used for a variety of applications from textile printing to adhesive printing. Will give maximum ink deposit.

Diamond
Diamond profile - This blade profile is specifically designed for the use on PCB machines, the squeegee is held close to the holder giving greater control whilst printing. It enables very close control of the squeegee angle and shows very little squeegee bending under pressure.

S-Cut and S-Cut with Land
S-Cut - Chisel shaped profile with a sharp tip.
S-Cut with Land - Chisel shaped profile with flat tip.

Used extensively in container printing. Good adaptation to irregular surfaces and excellent ink deposit control.

- Profiles are available in 45˚ and 62˚ angles.
- All Lands are normally 1mm.

What do our customers say...

“Yes, there is cheaper out there but there isn’t anything better than Unitex® squeegees.”
Print Supervisor, Textile Printer, Indonesia

“Our purchasing department saved a few Dollars by getting a low cost squeegee, what a mistake, we lost a large customer through providing an inferior print.”
Managing Director, Automotive, Taiwan

“From a single shipment of one (Non Unitex®) squeegee type the Shore Hardness ranged between 69˚ and 82˚. It took ages to set up and the finished product was inconsistent.”
Screen Printer, Graphics, USA

“While printing with our last new squeegee there was a defect right in the middle of the printing edge. We went straight back to Unitex® after that.”
Printing Technician, Multi-National Electronic Goods Manufacturer, Asia

“We print Solar Cells. Saving a few Euros on a squeegee and potentially scrapping a print run worth thousands is not a risk we are willing to take.”
Technical Manager, Solar Cell Manufacturer, Europe
Unitex® squeegee care - maintaining quality and reducing costs

The Squeegee Care guide is designed to ensure your Unitex® Squeegee is running to an optimum level of performance at all times.

Before use

- Squeegees should not be stored in sunlight or bright light - UV light will darken the squeegee colour, although this will not have a negative effect on the quality of its performance
- Try to store squeegees between 15-25°C in dry conditions and away from inks - in high humidity squeegees will absorb moisture and solvents from the air
- Store squeegees flat, do not leave rolled up
- When using a roll, leave flat for 24 hours so the squeegee has time to relax

General

- Squeegees harden with time – test old squeegee regularly. Do not use old squeegee that is 5 to 10 degrees more than its original hardness
- The shelf life of the new unused squeegee is approximately two years if stored correctly
- Do not use a squeegee without ink. It will quickly destroy the printing edge after very few passes

In use

- Squeegees should be cleaned immediately after use to prevent the accumulation of dried ink
- Remove all remaining ink deposits from the holder and the squeegee. Any remaining can cause marks from the squeegee during subsequent printing operations
- Print quality may deteriorate during a long run as the sharp edge is lost; therefore plan to swap the squeegee early. Rounded edges use and deposit more ink
- When storing a squeegee still mounted in the holder, do not rest it on the squeegee or allow the squeegee to touch anything during storage
- Squeegees or their holders must not be left in solvents to soak. Soaking will cause swelling and loss of resilience
- When cleaning the squeegee use a soft cloth and always wipe away from the edge
- To prolong the life of a squeegee, “rest” it for 12 hours after cleaning and before the next printing operation starts

Grinding/Sharpening

- You should not be required to sharpen a squeegee prior to use
- Only sharpen a squeegee that is clean, dry and has not been used for printing for at least 12 hours

Packaging

- Your squeegee packaging is optimised to ensure it arrives with you in the best condition possible
- We use secure, moisture proof containers for sea freight.
- Light weight packaging for air freight
- Priority freight if required for fast delivery
- Customer specified carriers when required

Squeegee marking

Unless specified at time of ordering all Unitex® squeegees are marked with:

- UNITEX
- Uلون HP or MARATHON
- Squeegee Grade
- Batch Number
- Made in the UK
Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Our innovative engineered solutions accelerate performance for customers in a sustainable way. The Trelleborg Group has local presence in over 40 countries around the world.

WWW.TRELLEBORG.COM/APPLIEDTECHNOLOGIES

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www.linkedin.com/company/unites--trelleborg-applied-technologies

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