

150 YEARS OF TEXTILE EXCELLENCE

# [PROTECTIVEWEAR]

FABRICS

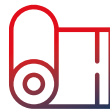


# 150 YEARS OF TEXTILE EXCELLENCE

## GROUP FACTS & FIGURES



Market leader  
in the European workwear market



The group overall produces more than  
50 millions metres of fabric annually



The group counts  
over 600 employees



Fabrics sold and distributed  
in more than 70 countries



Pionier in sustainability





## KLOPMAN INTERNATIONAL



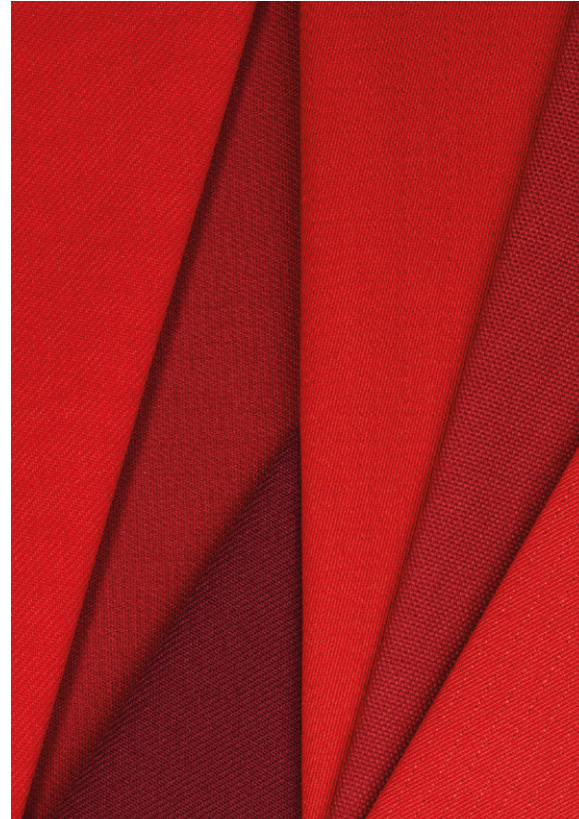
**Klopman International** has been a European leader in the production of technical fabrics for workwear for over 55 years, with three business areas dedicated to the different fields of application: Workwear, Protectivewear and Corporatewear.

The company was the first to introduce the use of polyester/cotton blend, gaining a third of the European market in some sectors and now producing fabrics in over 170 styles and different colour shades.

Klopman has its headquarters and production site in Frosinone, Italy, with a plant covering 70,000 square metres.

The company has commercial branch offices in Dusseldorf, Lyon, Borås (Sweden), Moscow, Dubai and Bangkok, plus a production site in Jakarta to serve the Asian market directly.

Klopman has always focused its attention on providing the highest customer service experience, top - quality products with an emphasis on innovation, product responsibility and sustainability.



## TDV INDUSTRIES



**TDV Industries** is a France-based company specialising in the production of high-quality technical fabrics. Founded in 1864, TDV Industries is recognised for its expertise in developing innovative and performance fabric, including those customised for clients' needs.

The company is seen as a pioneer in sustainability for its early commitment to international frameworks such as the United Nations Global Compact, and for its commitment to developing fabrics with improved environmental performance and the most positive possible social and societal impact.

As well as solid experience in fabric production for the workwear sector, TDV is highly regarded in the military sector and in security, police and fire services. The company supplies camouflage fabrics, as well as fabrics for uniforms and personal protective equipment. All fabrics meets the most stringent requirements through the use of advanced technologies and high-quality materials.





◆ **K-FLAME PRO 175**

**175gr** - Inherent Flame Retardant  
48,5% MAC / 34% Co / 17% PA  
/ 0,5% CF  
Plain



■ **NASHNEW 5**

**205gr** - Inherent Flame Retardant  
70% MAC / 20% Co / 9% PA  
/ 1% Anti-static  
3x1 S Twill



◆ **K-FLAME PRO 175 2L**

**210 gr** - Inherent Flame Retardant  
2L Laminate - 48,5% MAC  
/ 34% Co / 17% PA / 0,5% CF  
Membrane: 100% PU  
Plain



■ **SECURIT AS 240**

**240gr** - Inherent Flame Retardant  
Crease resist - Hydrofoil  
40% Meta-Aramid / 34% MAC  
/ 25% Co / 1% Anti-static  
2x1 Z Twill



◆ **K-FLAME PRO 265**

**265gr** - Inherent Flame Retardant  
48,5% MAC / 34% Co / 17% PA  
/ 0,5% CF  
2x1 S Twill



◆ **K-FLAME PRO 320 WELD2**

**320gr** - Rough backside  
Hydrofoil  
47% MAC / 32% Co / 20,5% PA  
/ 0,5% CF - 3x1 Z Twill



◆ **K-FLAME PRO 320**

**320gr** - Inherent Flame Retardant  
Hydrofoil  
47% MAC / 32% Co / 20,5% PA  
/ 0,5% CF - 3x1 Z Twill



◆ **K-FLAME PRO FLEX 320**

**STRETCH 320gr**  
Inherent Flame Retardant  
51,5% MAC / 34,5% Co / 10,5% PA  
/ 3% EOL (XLANCE®) / 0,5% CF  
3x1 Z Twill



■ **SECURIPACK 2/320**

**320gr** - Inherent Flame Retardant  
Crease resist - Hydrofoil  
54% MAC / 45% Co / 1% Anti-static carbon - Satin 4



■ **SECURITHOR**

**390 gr** - Inherent Flame Retardant  
Crease resist – Hydrofoil  
52% PES FR / 26% MAC / 21% Co / 1% Anti-static - Double face



◆ **K-FLAME PRO 175 SOFTSHELL**

**460gr** - Softshell  
48% MAC / 34% Co / 17% PA / 1% CF  
Plain





# Aramid fibre



## ◆ K-FLAME XTRA 165

**165gr** - Inherent Flame Retardant  
45% AR / 45% CV FR / 9% PA / 1% CF  
2X1 Z Twill



## ◆ K-FLAME XTRA 245 2L

**280gr** - Inherent Flame Retardant  
2L Laminate - 35% AR / 30% MAC / 25% Co / 9% PA / 1% CF  
Membrane 100% PU  
2X1 Z Twill



## ◆ K-FLAME XTRA 180

**180gr** - Inherent Flame Retardant  
45% AR / 45% CV FR / 9% PA / 1% CF  
2X1 Z Twill



## ◆ K-FLAME XTRA 245 SOFTSHELL

**515gr** - Softshell  
35% AR / 30% MAC / 25% Co / 9% PA / 1% CF  
Membrane 100%PU - Fleece 50% MAC / 34% Co / 16% PES  
2X1 Z Twill



## ◆ K-FLAME XTRA 245 HYDRO

**245gr** - Hydrofoil  
35% AR / 30% MAC / 25% Co / 9% PA / 1% CF  
2X1 Z Twill



## ■ COREX 3

**340gr** - Inherent Flame Retardant  
64% CV FR / 35% AR / 1% Anti-static carbon  
Satin 8





# [ MULTIFUNCTIONAL ]

## ◆ MEGATEC-K

150gr - Flame retardant  
68% Co / 30% AR / 2% CF  
Plain



## ◆ MEGATEC 250N HV

245gr - Flame retardant  
Hydrofoil  
75% Co / 24% PES / 1% CF  
2X2 Z Twill



## ■ SECURIPACK 1/280

280gr - Inherent Flame Retardant  
Crease resist - Hydrofoil  
66% Co / 33% PES  
/ 1% Anti-static carbon  
Satin 4



## ◆ MEGATEC 300N

300gr - Flame retardant  
Hydrofoil  
75% Co / 24% PES / 1% CF  
2X2 Z Twill



## ◆ MEGATEC PLUS

310gr - Flame retardant  
Hydrofoil  
75% Co / 24% PES / 1% CF  
Satin 5/2



## ◆ MEGATEC 360N

350gr - Flame Retardant  
Hydrofoil  
75% Co / 24% PES / 1% CF  
2x2 Z Twill



## ■ EUREKASTAT

360gr - Crease resist  
Hydrofoil  
64% Co / 35% PES / 1% Anti-static carbon  
2x2 S Twill







# [ TREATED FR ]

◆ **SATURN FR**  
215gr - Flame retardant  
100% Co  
Rip Stop



◆ **JUPITER FR**  
240gr - Flame retardant  
100% Co  
2x1 S Twill



◆ **BRAVO FR**  
250gr - Flame retardant  
75% Co / 25% PES  
2x2 Z Twill



◆ **ARENA FR**  
300gr - Flame Retardant  
75% Co / 25% PES  
2X2 Z Twill



◆ **SCALA FR**  
320gr - Flame Retardant  
75% Co / 25% PES  
Satin 5/2



◆ **METEOR FR**  
335gr - Flame Retardant  
100 % Co  
3x1 S Twill



◆ **GEMINI FR**  
340gr - Flame Retardant  
100% Co  
Satin 5



■ **SECURIFLAM S310**  
340gr - Flame retardant  
100% FR Co  
Satin 5



■ **SECURISTEEL**  
345gr - Flame retardant  
80% FR Co / 20% PES  
2x2 S Twill



◆ **CHALLENGER 5000 FR**  
360gr - Flame retardant  
75% Co / 25 % PES  
2x2 Z Twill



■ **EUREKA**  
360gr - Flame Retardant  
65% FR Co / 35% PES  
2x2 S Twill



◆ **TECSTONE FR**  
375gr - Flame Retardant  
Hydrofoil  
64.5% Co / 35% PES / 0.5% CF  
2x2 Z Twill



◆ **MARS FR**  
410gr - Flame Retardant  
100% Co  
Satin 5



■ **SECURIFLAM 450**  
450gr - Flame Retardant  
100% FR Co  
Moleskin



◆ **NEW CAESAR FR**  
470gr - Flame Retardant  
100% Co  
Satin 5/3





# [ HIGH VISIBILITY ]

◆ **LUMINEX C-LYTE**  
180gr - Crease resist  
50% Co / 50% PES  
Broken Twill



◆ **LUMINEX 270**  
270gr - Crease Resist  
Hydrofoil  
85% PES / 15% Co  
Satin 5/3



■ **HIGHLANDS**  
240 gr - Crease resist  
Hydrofoil  
67% PES / 33% Co  
3x1 Z Twill



■ **XMAINE 260**  
260gr - Crease Resist  
70% PES / 27% Co  
/ 3% EOL (XLANCE®)  
Satin 5



◆ **LUMINEX C-STAT HYDRO**  
265gr - Hydrofoil  
50% Co / 49.5% PES / 0.5% CF  
3X1 Broken Twill



◆ **LUMINEX C2**  
230gr - Crease Resist  
60% Co / 40% PES  
3X1 S Twill



◆ **LUMINEX C50**  
270gr - Crease Resist  
50% Co / 50% PES  
3x1 Broken Twill



■ **HELVETYS PREMIUM FT**  
270gr - Crease Resist  
70% R-PES / 30% Co  
Ripstop Satin 5



OPTION RECYCLED PES



■ **FLUOLINE 270 5050**  
270 gr - Crease Resist  
50% Co / 50% PES  
Satin 4

OPTION RECYCLED PES



■ **FLUOLINE 270 6733**  
270gr - Crease Resist  
67% Co / 33% PES  
Satin 5



◆ **LUMINEX C50 R-PES**  
280gr  
Duraclean Fabric Protector  
50% Co / 50% R-PES  
3X1 Broken Twill



■ **FLUOLINE 300 55/45**  
300gr - Crease resist  
55% Co / 45% PES  
Satin 5



◆ **LUMINEX 310**  
310gr - Crease resist  
Hydrofoil  
85% PES / 15% Co  
Satin 5





# Sustainable Stretch & High-Vis fabrics



## ■ XMAINE 230 PC

230gr

85,5% PES / 12% Co / 2,5% EOL (XLANCE®)

Broken Twill



## ■ XMAINE 280 RPL

280gr - Crease resist

65% R-PES / 32% Lyocell / 3% EOL (XLANCE®)

3x1 S Twill



## ■ FLUOLINE 270 5050 R-PES

270gr - Crease resist

50% Co / 50% R-PES

Satin 4



## ◆ LUMINEX FLEX 280

280gr - Crease resist

79.5% PES / 16.5% Co / 4% EOL (XLANCE®)

3x1 Broken Twill



## ◆ LUMINEX 10CL SR

270gr - Duraclean Fabric Protector

50% Lyocell / 50% PES

3x1 Broken Twill



## ■ FLUOLINE 300 55/45 PREMIUM FT

300gr - Crease resist

55% Organic & Fairtrade Cotton / 45% R-PES

Satin 5





# [ ANTISTATIC ]



◆ **CONCEPT ESD**  
**150gr** - Crease resist soft  
67.5% PES / 31% Co / 1.5% CF  
Plain



◆ **TELESTAT PLUS**  
**175 gr** - Crease Resist  
68% PES / 31% Co / 1% CF  
Plain



◆ **SUPERBANDMASTER  
NEGASTAT**  
**205gr** - Crease resist  
65 % PES / 34% Co / 1% CF  
2X1 Z Twill



◆ **COVERSTAT 210**  
**210gr** - Regular  
75% Co / 24% PES / 1% CF  
2X2 Z Twill



◆ **SUPERBANDMASTER ESD**  
**210gr** - Crease resist  
66.5 % PES / 32% Co / 1.5% CF  
2x1 Z Twill



◆ **INDESTRUCTIBLE  
NEGASTAT**  
**240gr** - Crease resist  
65% PES / 34% Co / 1% CF  
2X1 Z Twill



◆ **INDESTRUCTIBLE ESD**  
**245 gr** - Crease resist  
66.5% PES / 32% Co / 1.5% CF  
2X1 Z Twill



◆ **COVERSTAT 250**  
**250gr** - Regular  
75% Co / 24% PES / 1% CF  
2X2 Z Twill



◆ **COVERSTAT 300**  
**305gr** - Regular  
75% Co / 24% PES / 1% CF  
2X2 Z Twill



# [ BARRIER ]



◆ **VEKTRON 3005**  
**115gr** - Pure  
98.7% PES / 1.3% CF  
2X2 Z Twill







# [ FOULWEATHER FABRICS ]



◆ **DETROIT 2L**  
170gr - 2L Laminate  
100% PES - Membrane: 100% PU  
Plain



◆ **STARFIELD 2L**  
275gr - 2L Laminate  
65% PES / 35% Co - Membrane 100% PU  
Panama IRR



# [ CHEMICAL PROTECTION ]



◆ **NEOSTAT 275**  
275gr - Hydrofoil  
99.5% PES / 0.5% CF  
3X1 Broken Twill



Scan the QR code to check all available on-line colours for each fabric style

## **MATERIALS**

### **Aramid**

Also known as aromatic polyamide, aramid fibre is a manmade material with outstanding mechanical characteristics as well as heat resistance (up to 200°C – 300°C). It neither flames nor melts. It is what's known as "inherently flame retardant". Aramid fibres are the right candidates for fabrics expected to be light and soft at the same time as offering high resistance to heat and flame.

### **Modacrylic**

Modacrylic is an inherently flame-retardant fibre that can be used alone or in blends. It has self-extinguishing properties, and a char barrier works as a shield to minimize fire damage.

It has a very good LOI property value of > 32 (LOI=Limited Oxygen Index)

### **Polyamide**

Polyamide is a light synthetic fibre with outstanding mechanical properties; it is often used in blend with other fibres to boost resistance to abrasion and to tear. For fabrics expected to get dry very fast, polyamide, being non-water absorbent.

### **Cotton**

Cotton is a natural fibre providing comfort and resistance. It is particularly suitable for fabrics in direct contact with the skin, as it is non-allergenic and moisture absorbent. Cotton is a natural fibre that can be treated to be flame-resistant.

### **FR Viscose**

FR Viscose is based on wood-pulp that has been treated to become inherent flame-retardant. This is a man-made cellulosic fibre has flame retardant properties and is extensively used in fabric blends where it provides increased moisture absorption and comfort without compromising on protection.

### **Viscose**

Viscose is an artificial fibre chemically obtained from wood-pulp (cellulose). The fibre is breathable and grants silkiness and softness to fabrics; for that reason viscose is also named «artificial silk».

### **Polyester**

Polyester is a light non-water absorbent strong synthetic fibre. Used in blend with other fibres, it makes fabrics easy to wash and dry. Polyester fibre is long-lasting and resistant to many chemical products.

### **Antistatic fibres**

The proper name should be «conductive fibres» (of electricity) that dissipate electrostatic discharge. They can be composed of polyester or polyamide that has been coated or has a conductive core (copper, carbon, silver ...). There are also metallic conductive fibres (stainless steel).



## NORMS & FEATURES

### PROTECTION AGAINST HEAT & FLAME

Flame retardant (FR) fabrics and clothing are designed to prevent people in contact with flame and heat from being injured or burned. FR fabrics might char but should neither flame nor burn. Depending on working conditions or industrial fields, different norms can apply.



#### EN 11612

**EN 11612** manages the protection against heat and flame in industrial fields excepted the welding sector. 5 criteria are controlled:

- > Flame spread A1 (method A) or A2 (method B) requires: no flame + no hole + no melt + no flaming or molten debris + no afterglow.
- > Convective heat from the minimal and lowest B1 to the highest B3
- > Radiant heat from the minimal and lowest C1 to the highest C4
- > Aluminium molten splash from the minimal and lowest D1 to the highest D3
- > Cast-iron molten splash from the minimal and lowest E1 to the highest E3
- > Contact heat from the minimal and lowest F1 to the highest F3



#### EN ISO 14116

The EN ISO 14116 standard specifies fabrics with limited flame spread in order to protect the user from short-term, accidental contact with heat or sparks. The norm classifies the flame spread in 3 categories, index 1 for the least demanding to index 3.

| INDEX1   | INDEX2   | INDEX3   |
|--|--|--|
| No flame or hole to reach the upper edge of the fabric | No flame or hole to reach the upper edge of the fabric | No flame or hole to reach the upper edge of the fabric |
| No flaming debris                                      | No flaming debris                                      | No flaming debris                                      |
| No Afterglow   | No Afterglow   | No Afterglow   |
| X  | No hole formation                                      | No hole formation                                      |
| X  | X  | No afterflame > 2s                                     |



#### EN ISO 15384

EN ISO 15384 provides minimum performance requirements for protective clothing designed for use for extended periods during wildland firefighting and associated activities.



#### NFPA 2112

The NFPA 2112 (National Fire Protection Association 2112) Standard provides minimum requirements for the design, construction, evaluation, and certification of flame-resistant fabrics used in garments for industrial personnel. The standard, mostly used in non-European areas, specifies the minimum performance requirements and tests methods for flame-resistant fabrics and components and the certification is required for garments for use in areas at risk from flash fires.

## PROTECTION AGAINST FLAME AND HEAT DURING WELDING



EN 11611

EN 11611 manages protection against flame and heat during welding and allied processes and identifies 2 levels of risks:

> Class 1: low risks (> 15 molten splash drops and low radiant heat)

> Class 2: high risks (> 25 molten splash drops and elevated radiant heat)

For both levels of risks fabric should not flame, hole formation is forbidden as are molten or flaming debris are excluded, no afterglow is allowed.

## ELECTRIC ARC PROTECTION



The IEC 61482-2 standard specifies requirements and test methods applicable to materials and garments for protection against the thermal hazards of an electric arc. An electric arc is a continuous high-voltage electric discharge between conductors generating light and very intense heat. There are two international test methods:

### Container test method CEI EN 61482-1-2:

The fabric/garment is exposed to an electric arc constrained in a specific container with a specific electrode arrangement for 0.5 seconds.

> **APC 1** (Arc Protection Class 1) corresponds to an arc current of 4kA;

> **APC 2** (Arc Protection Class 2) corresponds to an arc current of 7 kA.

### Open arc method CEI EN 61482-1-1:

This test method aims at establishing the ATPV (Arc Thermal Performance Value), EBT (Energy Breakopen Threshold) or the incident energy limit (ELIM) of a fabric. The ATPV is the amount of energy required to cause a second-degree burn. The EBT is the amount of energy that opens the material. ELIM is the numerical value of incident energy below which there is no data point with the amount of heat transmitted through the product reaching the Stoll criteria or with the product exhibiting breakopen.

All these values are expressed in calories per cm<sup>2</sup>. The HAF (Heat Attenuation Factor) is also measured during the test, describing the amount of heat blocked by the fabric.

## PROTECTION AGAINST ELECTROSTATIC DISCHARGE:



EN 1149-5

EN 1149-5 is the European Standard for garments. It specifies material and design requirements for electrostatic dissipative protective clothing, used as part of a total earthed system, to avoid incendiary discharges. The requirements may not be sufficient in oxygen enriched flammable atmospheres. The European standard is not applicable for protection against mains voltages.

> Part 1 (EN 1149-1) measures surface resistivity

> Part 2 (EN 1149-2) measures cross resistance

> Part 3 (EN 1149-3) measures the charge decay

## ESD PROTECTION

Electrostatic Discharge, or ESD, is a single-event, rapid transfer of electrostatic charge between two objects, usually resulting when two objects at different potentials come into direct contact with each other.



**IEC 61340-5-1**

IEC 61340-5-1 is a product standard and refers to the general requirement for an ESD control program. ESD can have very short duration high current levels and can cause ignition of flammable materials or damage to electronic components. This method includes garment testing.

## PROTECTION AGAINST LIQUID CHEMICAL SPLASH / WATER-OIL SPLASH:



**EN 13034**

The standard EN 13034 manages protective clothing (Type 6 for overalls or Type PB6 for garments partially covering the body) against low and medium risks of contact with liquid chemicals (i.e. accidental splash or light sprays). Liquid repellency (at least level 3) and liquid penetration resistance (at least level 2) are expected to comply with the norm.

## HIGH-VISIBILITY FABRICS



**EN 20471**

High-visibility fabrics certified for EN ISO 20471 are designed to ensure people are as visible as possible in the workplace. Yellow, orange-red and red are the 3 official Hi-Vis colours and the vast majority Hi-Vis colours produced by Klopman & TDV Industries comply with EN 20471 even after 50 industrial washes conforming to ISO 15797 at 75°C.

## PROTECTION AGAINST LIQUID PHYTOSANITARY SPLASH



**ISO 27065**

ISO 27065 manages protective clothing for people in contact with or handling phytosanitary products (pesticides). 3 levels of protection have been defined:

- > Level 1 (C1): low potential risk / when there is no handling but potential indirect contact (re-entry),
- > Level 2 (C2): average to high risk / when handling pesticide products,
- > Level 3 (C3): high risk / when handling concentrated pesticide products or direct contact (spraying operations).

Most of the time leak-proof single-use PPE are requested to cover level 3. Protective textile solutions by TDV Industries cover levels C1 and C2.

## PROTECTION AGAINST FOUL WEATHER CONDITIONS



**EN 343**

EN 343 is a European Standard for protective clothing that outlines a minimum level of protection against wet weather, with the whole garment construction taken into consideration, in addition to the fabric used. This standard also tests for strength and tear resistance, as durability is crucial for an item of waterproof clothing to retain its functionality and be able to withstand a hard day's work.

## OTHER OPTIONAL FUNCTIONALITIES



**Hydrofoil**

### **Water repellency**

A special combined finish grants both water and oil repellency granting then the above mentioned performances. For long lasting performance reimpregnation is necessary. Advised reimpregnation procedure is given to you on request.

### **Oil repellency**

A special finish processed onto the fabric to grant oil repellency properties so that major greasy substances (except graphites) are not absorbed by the fabric. This is especially important when fabrics include polyester fibre which is oleophilic. For long lasting performance reproofing is recommended.

### **Oil & water repellency**

A special combined finish granting both water and oil repellency characteristics. For long lasting performance reimpregnation is necessary. The recommended reimpregnation procedure is on request.



**Duraclean: resistant to soil - easy to wash**

Based on a new generation of eco-friendly chemistry, Duraclean is a Klopman finish which gives fabrics the ideal balance of repellency and washability.

When worn in dry conditions, Duraclean has hydrophobic features which make it resistant to oil and soil, thanks to a chemical component which reduces absorption. In wet conditions (during the washing process), Duraclean has soil-release properties, enabling the water and detergent molecules to extract soil from the fabric.

The fabric, and therefore the garment, stays cleaner when in use and releases soil during washing.



## OUR SUSTAINABLE OPTIONS

Greenwear™ is our registered trademark. It summarises the concept of moving forward to a greener consciousness when wearing a garment. We offer the market different solutions even in combination.



### Fabrics made with Recycled Polyester

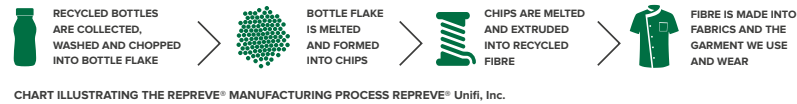


Klopman proudly offers the market fabrics formed using **high-quality recycled yarns made from recycled materials** including **recycled plastic bottles**. This means making sustainable use of thousands of tonnes of waste plastic bottles which might otherwise end up in landfill.

**and traceability of the whole supply chain.**

This solution makes products more earth-friendly; in comparison with virgin polyester, recycled polyester reduces energy and water consumption and greenhouse gas emissions.

**Klopman fabrics made with recycled polyester ensure maximum transparency**



### Better Cotton

Better Cotton is a not-for-profit organisation that exists to help cotton communities thrive and survive, while protecting the environment.



### Organic Cotton

Buying organic cotton means purchasing natural fibres which haven't been subjected to the use of fertilisers, insecticides or pesticides. The benefits are significant: from enhancing biodiversity to taking care of the final wearer with a safer, more sustainable solution. We use traceable international standards for organic cotton sourcing.

TDV Industries: EGL/62719/869939/1



### Fairtrade Cotton

Buying products made with Fairtrade-certified cotton guarantees the empowerment of cotton farmers through better prices, while the payment of the Fairtrade premium also contributes to protecting people and the environment through the prohibition of genetically modified seeds.

TDV Industries: FLO ID 3517

Klopman: FLO ID 19786



### Ecolabel

The EU Ecolabel is the official European Union voluntary label for environmental excellence. The EU Ecolabel certifies products with a guaranteed and independently verified low environmental impact, which is why "labelled" services must meet high environmental standards throughout their entire life cycle: from raw material extraction through production and distribution to disposal.





**Klopman International**



[www.klopman.com](http://www.klopman.com)

**TDV Industries**



[www.tdvindustries.com](http://www.tdvindustries.com)