

TENCATE Tecapro®

The TenCate Tecapro® collection is a range of flame-retardant finished fabrics.

BD 9311 - 335 g/m²

Flame-retardant finished fabric
Multi-risk protection
99/1% Cotton/Static-Control™

TenCate Tecapro® - BD 9311 is a flame-retardant finished fabric with a 3/1 twill construction. This cotton fabric is not only cool and breathable, but has excellent moisture absorption.

Extraordinary value – Suitable for application in protective clothing used mainly in the metal industry.

Premium thermal protection – Protects against convective and radiant heat. Tested according to EN ISO 11612 A1, A2, B1, C1, E2, F1: 2008 (Industrial flame & heat hazards).

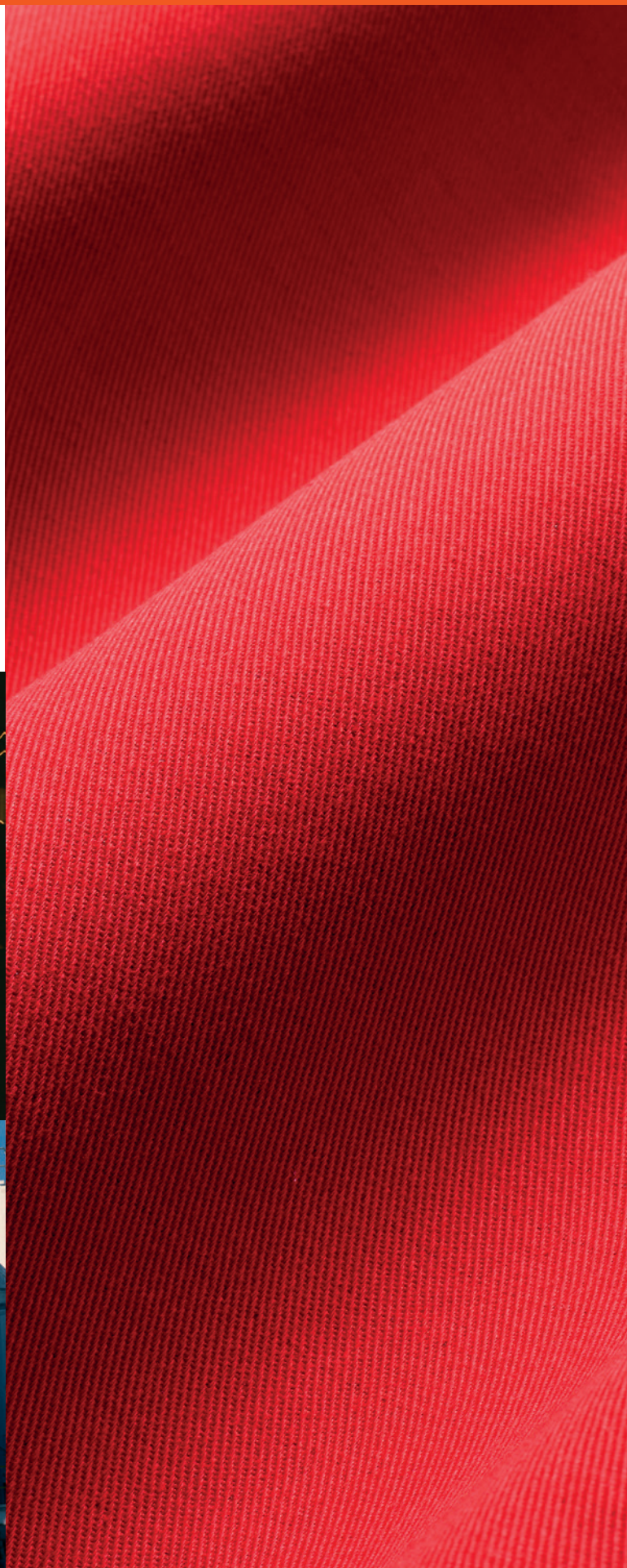
Comfortable – Feels soft and supple, thanks to our special permanent Comfort-Control finish.

Highly durable – Extremely long lifecycle at very low cost.












Anti-static for explosion risk protection – TenCate's Static-Control™ fibre is a trilobal core conductive filament fibre (complies with EN 1149-5: 2008, testmethod EN 1149-3: 2004).

Long-lasting looks – Withstands repeated home or industrial laundering. The flame-retardant properties of this fabric are guaranteed even after 50 washes according to ISO 15797 (tested according to EN-ISO 15025: 1995). Please contact us for further advice on laundering.

INDUSTRIAL SAFETY



The TenCate Tecapro® collection is a range of flame-retardant finished fabrics.

| Technical data | TenCate Tecapro® | Test method |
|---|---|--|
| Quality | BD 9311 | |
| Width | 152 cm (+2/-1 cm) | ISO 3801: 1978 |
| Weight | 335 g/m ² (± 5%) | ISO 3932: 1980 |
| Composition | cotton/Static-Control™ 99/1% | |
| Construction | 3/1 twill | |
| Available finishes | Durable flame-retardant finish with Comfort-Control | |
| Tensile strength | 1300 N x 600 N (±10%) | ISO 13934-1: 1999 |
| Domestic laundering |  60 | |
| Industrial laundering |     75 °C | |
| Protection | Multi-risk protection | |
| PPE requirements* |    | |
| Certification | | |
|  | Industrial flame & heat hazards | EN ISO 11612 A1,A2,B1,C1,E2,F1: 2008 (A1 + A2= 50 x ISO 15797 - 75 °C) |
|  | Welding | EN ISO 11611, class 1: 2007 |
|  | Anti-Static for explosion risk | EN 1149-5: 2008, testmethod EN 1149-3: 2004 |
| | General requirements | EN ISO 13688: 2013 |

* Copyright symbols: NEN, Delft (Netherlands)

Standard colours



The colours above are standard colours and available with a minimum order length of 100 metres. Colours shown are references only.

Optional colours



TenCate, the world's textile dyeing expert, can produce almost every colour with a minimum quantity of 3000 metres. Smaller quantities can be ordered, subject to a surcharge. For more information about colour-combination requirements, as well as any other information you may need, please contact TenCate.



Member of the E.T.S.A.

TenCate Protective Fabrics

TenCate is the world's No. 1 producer of protective fabrics for the manufacturing of safety wear. We supply garment-makers with an extensive range of top-quality and technologically advanced fabrics.

Our fabrics become lifesaving garments for firefighters, industrial workers, military personnel and other professionals working under hazardous conditions in danger zones around the world.

We work closely with our customers, end-users, fibre and chemical manufacturers and independent laboratories. As a result, TenCate Protective Fabrics is the one source the world looks to for leadership in knowledge of materials, consistent product quality, and a proven commitment to service excellence.

TenCate is a trademark of Royal Ten Cate nv. Tecasafe is a trademark of Ten Cate Protect bv.
Ten Cate Protect bv is a subsidiary of Royal Ten Cate nv.

TENCATE
materials that make a difference

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The TenCate Tecapro® collection is a range of flame-retardant finished fabrics.

| TENCATE TECAPRO® - XB 9340 | | | |
|----------------------------|--------|-------|----------------------|
| Colour | Number | Group | XB 9340 |
| | | | 340 g/m ² |
| DARK-SLATE BLUE | 42049 | | |
| DENIMBLUE | 40518 | | |
| NIMBUS GREY | 35348 | | |
| TRAFFIC ORANGE | 35349 | | |

* Durable flame-retardant finish with Comfort-Control and Hydro-Tec

| TENCATE TECAPRO® - BD 9311 | | | |
|----------------------------|--------|-------|----------------------|
| Colour | Number | Group | BD 9311 |
| | | | 320 g/m ² |
| FIREBRICK | 42112 | S | |
| INKT BLUE | 42115 | | |
| KOBALT BLUE | 42114 | | |
| MANDARINO | 42113 | | |

* Durable flame-retardant finish with Comfort-Control

| TENCATE TECAPRO® - KS 52 | | | |
|--------------------------|--------|-------|----------------------|
| Colour | Number | Group | KS 52 |
| | | | 335 g/m ² |
| CALEDO | 47240 | S | |
| CINABER | 40472 | | |
| CORAL | 40640 | S | |
| DURANGO | 40803 | | |
| GRAPHITE | 40471 | | |
| SAPPHIRE | 40458 | | |
| TORBER | 40823 | | |

* Durable flame-retardant finish

| TENCATE TECAPRO® - BG 9500 | | | | |
|----------------------------|--------|-------|--------|----------------------|
| Colour | Number | Group | Finish | BG 9500 |
| | | | | 350 g/m ² |
| H.V. YELLOW | 64516 | S | * | |
| MARMELADE | 66777 | S | * / ** | |
| NAVY | 63805 | | * / ** | |
| PAPAYA | 61070 | S | * / ** | |
| BLACK | 60475 | | * / ** | |
| RIVER | 60662 | | * / ** | |
| VULCANO | 66935 | | * / ** | |
| DUBLIN | 66907 | | * | |

* Durable flame-retardant finish with Comfort-Control and Hydro-Tec

** Durable flame-retardant finish with Comfort-Control

= EN 20471: 2013 (High Visibility colour yellow or contrast colour)

| TENCATE TECAPRO® - XC 9001 | | | |
|----------------------------|--------|-------|----------------------|
| Colour | Number | Group | XC 9001 |
| | | | 250 g/m ² |
| CADET BLUE | 41881 | | |
| DODGER BLUE | 41894 | | |
| GAINSBORO | 41883 | | |

* Durable flame-retardant finish with Comfort-Control and Hydro-Tec

| TENCATE TECAPRO® - BD 11 AND BD 22 | | | | |
|------------------------------------|--------|-------|----------------------|----------------------|
| Colour | Number | Group | BD 11 | BD 22 |
| | | | 230 g/m ² | 290 g/m ² |
| GRAPHITE | 40471 | | | |
| CALEDO | 47240 | S | | |
| CORAL | 40640 | S | | |
| SAPPHIRE | 40458 | | | |

* Durable flame-retardant finish

| TENCATE TECAPRO® - BG 9025, BG 9030, BG 9035 AND BG 9045 | | | | | | |
|--|--------|-------|----------------------|----------------------|----------------------|----------------------|
| Colour | Number | Group | BG 9025 | BG 9030 | BG 9035 | BG 9045 |
| | | | 260 g/m ² | 300 g/m ² | 350 g/m ² | 450 g/m ² |
| H.V. YELLOW | 64516 | S | | | | |
| MARMELADE | 66777 | S | | | | |
| NAVY | 63805 | | | | | |
| PAPAYA | 61070 | S | | | | |
| RIVER | 60662 | | | | | |
| VULCANO | 66935 | | | | | |
| STONE | 60962 | | | | | |
| BLACK | 60475 | | | | | |
| STEELORANGE | 65596 | | | | | |

* Durable flame-retardant finish with Comfort-Control and Hydro-Tec

= EN 20471: 2013 (High Visibility colour yellow or contrast colour)

COLOURS 2016

Standard colours Optional colours

The colours above are standard colours available with a minimum order length of 100 metres. Colours shown are references only. TenCate, the world's textile dyeing expert, can produce the TenCate Tecapro® fabrics in almost any colour. Minimum order 3000 m. Other lengths possible at additional charge. For more information about colour-combination requirements, as well as any other information you may need, please contact TenCate.

Protective Fabrics
Outdoor Fabrics
Aerospace Composites
Armour Composites

Geosynthetics
Industrial Fabrics
Grass

The TenCate Tecapro® collection is a range of flame-retardant finished fabrics.

TENCATE TECAPRO®

This is a collection of flame-retardant finished fabrics based on cotton in a possible mix with polyester, para-aramid or polyamide. The fabrics are finished using a special flame-retardant enhancement process. These fabrics are comfortable and breathable, due to the high cotton content.

Suitable for application in protective clothing used, for example in the metal, welding, utilities, chemical and energy sectors. The fabrics offer protection against heat & flame, molten metal splash, electric arc, static electricity, poor visibility or liquid chemicals.

| | Productname | Composition | Blend | Weight (± 5%) | PPE-requirements | |
|------------|----------------------------|------------------------------------|----------|----------------------|------------------|----------|
| | | | | | Standard | Optional |
| NEW | TenCate Tecapro® - BG 9025 | cotton/polyester/Static-Control™ | 79/20/1% | 260 g/m ² | 🔥 ⚡ ⚡ ⚡ | 🏢 |
| | TenCate Tecapro® - BG 9030 | | | 300 g/m ² | 🔥 ⚡ ⚡ ⚡ | 🏢 |
| | TenCate Tecapro® - BG 9035 | | | 350 g/m ² | 🔥 ⚡ ⚡ ⚡ | 🏢 |
| | TenCate Tecapro® - BG 9045 | | | 450 g/m ² | 🔥 ⚡ ⚡ ⚡ | |
| | TenCate Tecapro® - KS 52 | cotton | 100% | 335 g/m ² | 🔥 ⚡ ⚡ | |
| | TenCate Tecapro® - BD 11 | cotton | 100% | 230 g/m ² | 🔥* | |
| | TenCate Tecapro® - BD 22 | cotton | 100% | 290 g/m ² | 🔥 | |
| | TenCate Tecapro® - BD 9311 | cotton/Static-Control™ | 99/1% | 320 g/m ² | 🔥 ⚡ ⚡ | |
| | TenCate Tecapro® - BG 9500 | cotton/polyester/Static-Control™ | 64/35/1% | 350 g/m ² | 🔥 ⚡ ⚡ ⚡ | 🏢 |
| | TenCate Tecapro® - XB 9340 | cotton/para-aramid/Static-Control™ | 74/25/1% | 340 g/m ² | 🔥 ⚡ ⚡ ⚡ | 🏢 |
| | TenCate Tecapro® - XC 9001 | cotton/polyamide/Static-Control™ | 84/15/1% | 250 g/m ² | 🔥 ⚡ ⚡ ⚡ | |

EN-Symbols

| | | | | | | | |
|----|------------------------------------|---|--|---|---|---|---|
| 🔥 | Heat & flame EN ISO 11612: 2008 | ⚡ | Electric arc EN IEC 61482-1-2: 2007 | 🔧 | Welding EN ISO 11611: 2007 | 🔧 | Anti-static EN 1149-3: 2004 |
| 🔥* | Heat & flame EN ISO 14116: 2008 | 🏢 | Liquid chemicals EN 13034: 2005 | 🏢 | High visibility or contrast colour EN 20471: 2013, EN 471:2003 | | General requirements ISO 13688: 2013 |

Collection 2016 - Copyright symbols: NEN, Delft (Netherlands)



Protective Fabrics

Outdoor Fabrics

Aerospace Composites

Armour Composites

Geosynthetics

Industrial Fabrics

Grass

PROTECTIVE FABRICS

TENCATE
Tecapro[®] A range of flame-retardant finished fabrics

Laundrying, care and maintenance recommendations

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Protective Fabrics
Outdoor Fabrics
Advanced Composites
Advanced Armour

Geosynthetics
Grass

TENCATE
materials that make a difference

1.0 INTRODUCTION

Laundering recommendations

Domestic laundering:      

Industrial laundering: 75°C

The extensive TenCate Tecapro® collection is a range of flame-retardant finished fabrics which provide high-quality solutions in terms of safety, comfort, durability and ease of maintenance. The fabrics are suitable for application in protective clothing used in various industries, and offer optimum protection against heat & flame, molten metal splashes, electric arc, static electricity, poor visibility or (limited) protection against liquid chemicals.

TenCate FR treatment

TenCate Protective Fabrics is a leading expert when it comes to textile technology and chemical processes. The TenCate Tecapro® fabrics have been specifically engineered to be flame-retardant protective fabrics. Durable flame-retardant properties of the TenCate Tecapro® collection are achieved by subjecting these fabrics to a flame-retardant treatment during processing. As a result of this chemical treatment, the fabrics are able to withstand the industrial laundering conditions required for proper cleaning of protective work clothing by maintaining the flame-retardant properties for the useful life of the garments when the correct care instructions and procedures are followed.

Maximum wear life

The flame-retardant properties of the TenCate Tecapro® fabrics are guaranteed for at least 50 washes at 75°C (EN-ISO 15025:1995; ISO 15797:2002). However, the protective properties of flame-retardant finished fabrics, as well as other flame-resistant fabrics, can be compromised by the presence of flammable contaminants on the garment, or on the fabric from which it is made. Protective clothing must therefore be laundered regularly and thoroughly to ensure that garments do not become excessively soiled, to remove contaminants and to avoid permanent staining. Following appropriate laundering, care and maintenance processes is essential to maximising a garment's wear life and ensuring the protective properties are not degraded. This should preferably be done by a professional industrial laundry to ensure that all necessary parameters (temperature, choice of detergents and dosage, mechanical action, nature of stains and type of fabric, etc.) are factored in and that the protective clothing will offer the required protection throughout its wear life.

TenCate Tecapro® collection

The TenCate Tecapro® collection is a range of safety-wear fabrics developed with either cotton or cotton-rich blends with polyester, polyamide or para-aramid fibres. Thanks to a high cotton content, the flame-retardant finished fabrics are highly comfortable and breathable. Specifically the fabrics with a satin weave are experienced by end-users as more comfortable, due to the fact that these fabrics feel softer and suppler.



| Productcode | Composition | Weight | Construction |
|-------------|---|----------------------|--------------|
| BG 9025 | cotton/polyester/Static-Control™ 79/20/1% | 260 g/m ² | satin |
| BG 9030 | cotton/polyester/Static-Control™ 79/20/1% | 300 g/m ² | satin |
| BG 9035 | cotton/polyester/Static-Control™ 79/20/1% | 350 g/m ² | satin |
| BG 9045 | cotton/polyester/Static-Control™ 79/20/1% | 450g/m ² | satin |
| KS 52 | cotton 100% | 335 g/m ² | satin |
| XB 9340 | cotton/para-aramid/Static-Control™ 74/25/1% | 340 g/m ² | satin |
| BD 9311 | cotton/Static-Control™ 99/1% | 320 g/m ² | twill |
| BG 9500 | cotton/polyester/Static-Control™ 64/35/1% | 350 g/m ² | twill |
| XC 9001 | cotton/polyamide/Static-Control™ 84/15/1% | 250 g/m ² | twill |
| BD 11 | cotton 100% | 230 g/m ² | twill |
| BD 22 | cotton 100% | 290 g/m ² | twill |

For optimum performance and comfort of protective clothing developed with TenCate Tecapro® fabrics, we recommend laundering the garment prior to the first wearing.

2.0 INDUSTRIAL LAUNDERING

2.1 DETERGENTS AND OTHER LAUNDRY PRODUCTS

Washing detergents. It is important to use detergents and wash temperatures that are sufficient to thoroughly clean the soiled clothing. The use of soaps (salts of fatty acids) is not recommended as they can form insoluble scums with hard water that are deposited on the fabric. Soap scums may be flammable and can adversely affect the thermal protective performance of the garment.

Alkalinity. In the industrial laundry processes, detergents with pH values ranging from 10–12 are effective in removing dirt and oil from soiled garments. It is commonly known that use of detergents with higher alkalinity, together with higher wash temperature, will improve cleaning. However, although the flame-retardant properties of the finished fabrics are not adversely affected by high pH, the effect on the colourfastness of garments, as well as on surface appearance, should be checked to maintain an acceptable balance between cleanliness and good after-wash appearance retention of the garments.

Bleach. Chlorine bleach (sodium hypochlorite) and hydrogen peroxide should not be used on flame-retardant finished fabrics, either separately or in detergents. Chlorine bleach and the presence of metals with hydrogen peroxide (oxygen bleach) chemically attack the flame-retardant finish and reduce the flame-retardant properties of the fabric. The gradual deterioration in fabric flame-retardant protective performance can also be caused by washing at high temperatures with detergents containing higher concentration of sodium perborate (also an oxygen bleach).

Optical brighteners. Detergents with optical brighteners should not be used as they may influence the colour change after washing.

Softeners. Softeners and other laundry additives can adversely affect the flame-retardant performance of the fabrics. We recommend against using supplemental softener, unless the impact on flame-retardant properties has been tested.

Starch. We do not recommend using starch or other hand builders, except in unique circumstances that are tested for impact on flame-retardant properties.

Use of softened water. For best cleaning results and the preservation of protective characteristics, an adequate supply of soft water is recommended for laundering processes. Hard water contains mineral salts, such as calcium and magnesium, that combine with other salts and fatty-based soaps to form insoluble deposits in the wash process and can deposit on the surface of the fabric in wash process. These can build up and mask the flame-retardant characteristics of the fabric. Using soft water reduces detergent consumption, improves the quality of washing and avoids adverse effects on flame retardancy.

2.2 WASHING PROCEDURES

Sorting. Garments should be sorted before washing into fabric type (composition and weight), dark and light colours and/or degree of soiling, and washed separately. Doing this avoids the transfer of any foreign flammable fibres, contamination or staining of light-coloured garments. It is common knowledge that washing and drying garments inside out minimizes surface abrasion and aids in maintaining good surface appearance, although this might not be easily done in practice. Specifically fabrics with a satin weave are more sensitive to surface appearance changes after multiple washes. Hard materials (buttons, zippers, or tools left in pockets during washing) can cause wear and tear.

Loading. Normal washer loads are generally set at 80% of washer capacity for 100% cotton garments. However, loading at 65% will provide better cleaning. It is important not to overload the machine. To ensure a cleaner wash and avoid setting wash wrinkles or other adverse after-wash appearance on the garments due to the excessive mechanical agitation, the load size must permit clothes to move freely through the wash water and rinse cycle.

Wash temperature. TenCate Tecapro® fabrics can be washed at temperatures up to 75°C. The higher the temperature, the better the cleaning for heavily soiled garments. However, washing at high temperatures may affect colourfastness and garment appearance.

Rinsing. Protective clothing must be adequately rinsed to remove wash chemicals and to lower the pH to that of the water supply. Detergent residues can adversely affect the flame-retardant properties of the fabric. To minimize washer-induced wrinkles, water temperature is reduced in each succeeding rinse cycle until the last operation (sour) where it should be 38°C or lower.

Sour. When laundering garments constructed of TenCate Tecapro® fabrics, the use of a sour operation after thorough rinsing is strongly recommended. The primary effect of sour is to reduce the fabric's pH from the alkaline detergents used for cleaning. This has the clear benefit of reducing the possibility of dermatological reactions from high pH. The use of acid sour has no adverse effects on flame resistance. To ensure that all traces of wash chemical alkalinity are neutralized, sour can be added to the final rinse cycle in the wash wheel. For suitable products and instructions for use, please refer to your detergent and chemical supplier.

Reapplication. When laundering TenCate Tecapro® fabrics with a Hydro-Tec finish, special attention should be paid to the following aspects. The fabric must be adequately rinsed to remove wash chemicals. Detergent residues disturb the repelling properties of the Hydro-Tec finish. For the most optimal performance the repellents should be applied after each wash. For suitable products and instructions for use, please refer to your detergent and chemical supplier.



2.3 DRYING PROCEDURES

TenCate Tecapro® fabrics can be dried and finished using common methods for cotton fabrics available to laundries. However, regardless of which method is chosen, it is important to put every effort to avoid unnecessary shrinkage, wrinkling, and adverse appearance of the garments after drying, in most cases known to be caused by overloading and overdrying. We do not recommend drying the garments below a moisture content of 3%. The fabrics with satin weave are more sensitive to surface appearance change after washing and drying.

Reactivation. It is important to make sure that TenCate Tecapro® fabrics with Hydro-Tec finish are completely dry after tunnel finishing or tumble drying. Heat and time are required to achieve optimal reactivation of the Hydro-Tec finish or a repellent finish reapplied after washing. Ironing and pressing have a positive effect on reactivation.

Tumble drying. For achieving the best results on the garments constructed of TenCate Tecapro® fabrics, tumble driers should not be overloaded and outlet temperatures should not exceed 80°C. Again, excessive shrinkage and an adverse look of the garments may occur if higher temperatures and overdrying are encountered. Tumbling without heat for an additional 10 minutes at the end of the drying cycle will cool the garments and will help to avoid unnecessary wrinkling. In addition, the garments should not remain in a hot tumbler when the drying cycle is complete.

Tunnel finishing. Wet garments can be finished by hanging on a hanger, and passing through a tunnel at a rate just sufficient to completely dry the garments. Garment temperature should not exceed 140°C. Every effort should be put to avoid overdrying.

Pressing and ironing. Depending on individual preferences, TenCate Tecapro® fabrics may be pressed or ironed and this does not adversely affect the flame-retardant properties.



3.0 DRY CLEANING & 4.0 REPAIR

3.0 DRY CLEANING

Dry cleaning is desirable for effective removal of greases and oils that are not easily removed by industrial or domestic laundering. Dry cleaning may not be as effective as wet washing in removing body soils and odours. Occasional laundering is recommended to remove these.

TenCate Tecapro® fabrics may be dry-cleaned using any of the normally used dry-cleaning solvents without impairing the flame-retardant properties. Standard precautions in the prevention of cross-staining related to the cleaning of mixed colours and batches should be adhered to. In addition, it is important that the dry-cleaning process is effective in removing all contaminants. Inefficient dry cleaning may lead to the build-up of water-soluble deposits, which could mask the flame-retardant properties of the fabrics.

This can be eliminated by occasional wet laundering.

4.0 REPAIR

To perform its protective function, a garment must be maintained in its original condition. Rips, tears, scuffing and thin spots are normal consequences of use and they should be repaired or restored before each wearing. Garments should be repaired with comparable flame-retardant fabric, thread and garment components. TenCate does not have specific guideline on repairs. Therefore the garment manufacturer must be consulted for instructions.



5.0 SITUATIONS TO AVOID IN USE

Do not use in the presence of strong acids, oxidizers or reducers. The flame-retardant polymer contained in the TenCate Tecapro® fabrics is highly resistant to most acids, bases and solvents. However, exposure to strong acids, such as hydrochloric or sulphuric, may degrade the strength of the cotton fibre and even cause holes in the fabric. Additionally, these fabrics should not be exposed to strong oxidizers and reducers, since these can cause an adverse reaction with the flame-retardant polymer.

The laundering, care and maintenance recommendations provided in this document are to the best of TenCate Protective Fabrics' knowledge at the time of printing and are intended to help achieving optimum cleaning while maximising the wear life of garments made of TenCate Tecapro® fabrics during practical use. They are based on general lab and industrial experience. TenCate Protective Fabrics would be happy to give further advice and assistance, but customers must ensure that the products are suitable for their purpose and conditions of use. They should then achieve similar results by performing their own tests and, if necessary, obtaining assistance from chemical suppliers for the chemicals used.

Collection 2015. These recommendations have been compiled with the greatest care by TenCate Protective Fabrics EMEA. TenCate is not liable for damage caused by not (correctly) following this advice. No rights can be derived from these recommendations.



PROTECTIVE FABRICS

Should any further information be required, please contact TenCate Protective Fabrics at the address below:

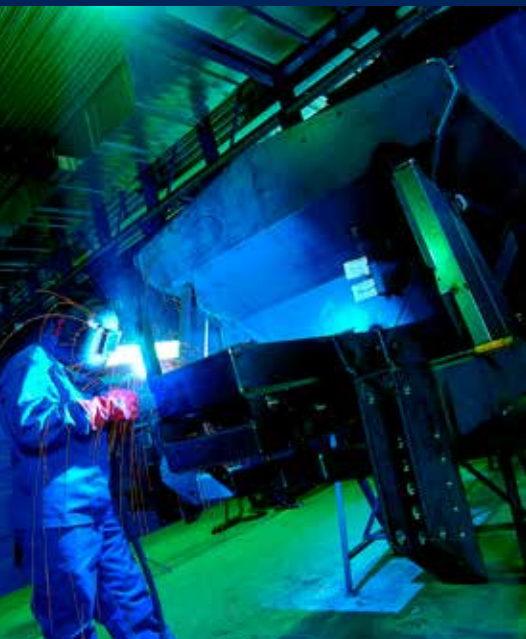
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 **TENCATE**
materials that make a difference