

# PERSONAL PROTECTION TEXTILES

40 suppliers of heavy duty fabrics



Claudia Ollenhauer-Ries

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Textile Media Services

# Personal Protection Textiles

40 suppliers of heavy duty fabrics

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By Claudia Ollenhauer-Ries

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# Introduction

The market for personal protection equipment (PPE) is growing owing to the high standard of health and safety regulations in industrialised countries and the rising demand for PPE in emerging countries. PPE has to serve the needs of many different sectors from medical to steel industries. Public procurement plays an important role, particularly for the military and safety forces, fire workers and first responders. While national regulations may differ from country to country, the European Union (EU) has a directive that unifies national regulations between member states.

The US is leading importer of PPE from other parts of the world. On the contrary, China is the largest exporter of PPE with further prospects for growth. The leading countries in the development of PPE are Germany, the UK and the US, which all have a dense network of co-operating institutes, manufacturers and end-users. Further downstream, textiles used for PPE apparel are of utmost importance, as their features directly influence the efficiency of the garment and the compliance to wear it.

PPE refers to protective clothing or other garments designed to protect the wearer's body from injury by blunt impacts, electrical hazards, heat, chemicals and infection, for job-related occupational safety and health purposes, and in sports, martial arts, combat, etc. PPE also includes helmets, shoes, goggles and hearing protection.

Personal armour can be defined as combat-specialised protective gear. Under British legislation the term PPE does not cover items such as armour. But, body armour for civilian uses, such as skiers' back protectors or motorcycle riders' protectors, falls under European Council Directive 89/686/EEC on PPE. This means that any armour sold for civilian use (i.e. not police or military) must be CE-approved according to this Directive. However, in the case of body armour, no European standard (CEN) currently exists; other available standards, such as the HOSDB Body Armour Standards for UK Police (2007), apply.

PPE can also be used to protect the work environment from pesticide application, pollution or infection from the worker (for example in a microchip factory). Protection may also be important in both directions, as with the use of disposable gloves by surgeons and dentists.

The European Council Directive defines *expressis verbis* (in express terms) two categories of PPE, with a third category for PPE items that do neither belong to either of these. So, in effect, the PPE sector comprises three categories:

## *Category I*

Category I PPE is classified as being all those devices or appliances with a simple design, intended to protect the wearer against slight risks (of superficial, light and reversible lesions from mechanical equipment, lubricants, cleansing materials, ordinary atmospheric agents, etc.) and from light, non-aggressive soiling.

**Europe: turnover of workwear manufacturers, 2000-2007**

(€m)	2000	2001	2002	2003	2004	2005	2006	2007
Austria	68.7	59.0	67.6	66.1	68.3	71.0	76.4	79.3
Belgium	175.3	170.5	..	230.2	211.6	226.5	220.7	243.9
Bulgaria	..	..	..	..	..	41.8	49.1	55.2
Cyprus	1.1	1.3	1.3	0.8	1.2	1.8	1.7	1.6
Czech Republic	..	..	.. <sup>u</sup>	.. <sup>u</sup>	.. <sup>u</sup>	..	103.5	107.8
Denmark	128.1	124.5	115.9	115.3	105.3	112.7	123.5	150.9
Estonia	11.6	17.5	22.7	29.6	30.8	29.1	32.4	38.4
Finland	71.9	74.1	78.2	85.5	80.5	73.0	76.8	81.8
France	416.7	403.9	.. <sup>c</sup>	448.0	456.1	479.2	443.7	464.9
Germany	401.0	426.6	434.0	341.4	413.7	.. <sup>c</sup>	424.8	470.9
Greece	..	..	..	33.6	44.9	34.7	30.7	34.3
Hungary	43.8	57.8	73.5	72.1	62.3	59.2	51.5	56.9
Ireland	16.0	13.1	13.5	10.9	9.1	.. <sup>c</sup>	.. <sup>c</sup>	.. <sup>cu</sup>
Italy	271.9	323.5	316.9	335.9	358.2	372.4	402.5	442.3
Latvia	35.8 <sup>p</sup>	34.9	32.5	33.1	27.8	26.3	27.5	37.4
Lithuania	13.2	16.4	20.8	21.0	23.0	23.1	26.6	31.6
Luxembourg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Malta	3.2	2.5	.. <sup>c</sup>	..	..	..	..	..
Netherlands	142.7	160.8	118.0	127.3	102.6	122.6	90.4	138.6
Poland	204.9 <sup>p</sup>	218.1 <sup>p</sup>	196.6	183.4	180.1	165.4	195.0	210.7
Portugal	68.2	80.3	58.4	69.2	.. <sup>c</sup>	75.0	.. <sup>c</sup>	60.7
Romania	..	54.8	50.6	51.7	78.3	106.2	96.5	114.3
Slovakia	25.7	30.2	38.0	56.4	70.0	54.5	72.4	32.6
Slovenia	16.8	16.4	14.7	14.7	15.6	10.0	15.8	16.5
Spain	505.5	372.0	354.9	264.5	384.3	617.8	375.5	379.6
Sweden	109.4	105.1	108.5	112.7	103.4	131.8	117.1	137.4
UK	800.3	685.1	764.4	600.2	607.5	630.8	617.3	588.3
<b>EU-25</b>	..	..	..	<b>3359.9</b>	<b>3552.0</b>	..	..	..
<b>EU-27</b>	..	..	..	..	<b>3662.6</b>	<b>4000.0<sup>e</sup></b>	<b>3745.9</b>	<b>3979.2</b>
Norway	49.3	43.7	48.3	52.3	40.3	40.0	48.0	64.0

<sup>e</sup> estimate; <sup>p</sup> provisional; <sup>c</sup> confidential; <sup>u</sup> extremely unreliable data; .. not available

Source: Eurostat

*Market for PPE*

The European market for PPE clothing is constantly growing for several reasons:

- more and stricter regulations on worker's protection, health and safety;
- new products for leisure and sports PPE clothing;
- growing demand for corporate fashion and workwear (class I).

The Eurostat statistics for industrial and occupational clothing for men and women show how the import and export rates for the EU-27 have evolved over recent years.

# TenCate Protective Fabrics

**TenCate Protective Fabrics, PO Box 186, NL-7440 AD Nijverdal, Netherlands.  
Tel: +31 548 633922. Fax: +31 548 633256. E-mail: tcp@tencate.com;  
www.tencateprotectivefabrics.com**

Royal Ten Cate (TenCate) is a multinational company that combines textile technology (spinning and weaving) with chemical processes (finishing). The production sites are located in Asia, the US and Europe. The number of Asian staff is growing steadily (2008: 936 employees), while the number of US staff has remained stable (2008: 1,573 employees) and the European number of staff has dropped constantly year by year (2008: 1,543 employees). Fabrics for personal protective equipment (PPE) are part of the Advanced Textiles & Composites division, which has a steadily growing share (2009: €397.3m) within the group's revenues (2009: €842m in total). TenCate is listed on the NYSE Euronext (AMX).

TenCate develops and produces specialist materials with specific characteristics. Its operations can be divided into four areas of application:

- safety and protection;
- aviation and aerospace;
- sport and recreation;
- infrastructure and environment.

TenCate has divided these segments further into eight divisions, each having its own products, applications and markets, such as safety fabrics, fibres for synthetic turf, geotextiles and composites for aviation, aerospace and anti-ballistics.

## Textiles for PPE

TenCate Protective Fabrics develops and produces a comprehensive range of proven, high-performance fabrics used to make protective clothing. Its fabrics are used by fire-fighters, industrial workers, military personnel and other professionals working under hazardous conditions in danger zones around the world.

TenCate Defense & Tactical is a global business unit of TenCate Protective Fabrics USA, based in Union City, Georgia, USA.

TenCate Protective Fabrics are designed for the following hazards:

- chemical hazards (dusts, acids, bases, oils, liquors);
- electric hazards (electric potential, static electricity charge);
- hot thermal hazards (heat, fire, sparks, metal splashes);
- visibility (darkness, smog, infrared light, camouflage);

to Royal Ten Cate in 1995, the last step was taken in 2006 to the current TenCate. Today, TenCate is a modern high-tech textile company, with global leadership in its markets.

In January 2008 TenCate acquired 100% of the shares of Composix of Newark, Ohio, USA. In March 2008 TenCate acquired 100% of the shares of YLA and CCS Composites, both of Benicia, California, USA. Also in March 2008, TenCate acquired 75% of inkjet research and development company Xenxia Technology of Cambridge, UK. In May 2008 TenCate acquired 50% of Edel Grass, Genemuiden, the Netherlands. In August 2008 TenCate acquired 50.65% of the newly formed company TenCate-Union Protective Fabrics Asia of Bangkok, Thailand.

## Strategy

TenCate aims to achieve leadership in growing markets for specialist, functional materials. Its strategy is characterised by value chain management, a focus on specialist materials, growth and a balanced product portfolio. For this purpose, TenCate invests in fast-growing markets and/or specific material applications in complementary technologies.

TenCate endeavours to achieve critical mass and strategic coherence between activities. Its strategy can be summarised as:

- focus on markets for specialised materials;
- market leadership;
- value chain management (TenCate business model);
  - end-user marketing (and intellectual property policy);
  - product differentiation;
  - technological innovation;
  - cost leadership;
- growth (buy and build strategy);
- balanced portfolio (fix it/exit strategy).

<b>Royal Ten Cate: financial performance, 2005-2009</b>					
(€m)	2005	2006	2007	2008	2009
Revenue	686.5	770.5	886.0	1,032.6	842.0
Operating result before amortisation (EBITA)	39.2	51.1	73.0	95.4	41.5
EBITA margin (%)	5.7	6.6	8.2	9.2	7.9
Operating result (EBIT)	38.5	50.1	69.4	83.8	32.7
Net income	30.5	76.0	46.4	51.1	23.9

Source: Royal Ten Cate

# Appendix IV: Standards

## Leading associations for standards

- ASTM International, West Conshohocken, Pennsylvania; USA, [www.astm.org](http://www.astm.org)
- CEN, Committee for European Standardization, Brussels, Belgium; [www.cen.eu](http://www.cen.eu)
- EPA, US Environmental Protection Agency, Washington, DC, USA; [www.epa.gov](http://www.epa.gov)
- European Agency for Safety and Health at Work, Bilbao, Spain; [www.osha.europa.eu](http://www.osha.europa.eu)
- IEC, International Electrotechnical Commission, Geneva, Switzerland; [www.iec.ch](http://www.iec.ch)
- IEEE, Standards Association, New York, NY, USA; [www.standards.ieee.org](http://www.standards.ieee.org)
- ILO, International Labour Organization, Geneva, Switzerland; [www.ilo.org](http://www.ilo.org)
- ISO, International Organization for Standardization, Geneva, Switzerland; [www.iso.org](http://www.iso.org)
- NESC, US National Electrical Safety Code, New York, NY, USA; [www.standards.ieee.org/nesc](http://www.standards.ieee.org/nesc)
- NFPA, National Fire Protection Association, Quincy, Massachusetts, USA; [www.nfpa.org](http://www.nfpa.org)
- Oeko-Tex Association, Zürich, Switzerland; [www.oeko-tex.com](http://www.oeko-tex.com)
- OSHA, Occupational Safety & Health Administration, Washington, DC, USA; [www.osha.gov](http://www.osha.gov)

## Important European standards

- DIN EN 100015 – Basic specification: protection of electrostatic sensitive devices
- DIN EN 25077 – Textiles: determination of dimensional change in washing and drying (ISO 5077)
- EN 340 – Protective clothing: general requirements
- EN 342 – Protective clothing: protection against cold
- EN 343 – Protective clothing: protection against bad weather
- EN 348 – Protective clothing: determination of behaviour of materials on impact of small splashes of molten metal
- EN 366 – Protective clothing: protection against heat and fire; evaluation of materials and material assemblies when exposed to a source of radiant heat
- EN 367 – Protective clothing: protection against heat and flames; determination of heat transmission on exposure to flame
- EN 368 – Protective clothing for use against liquid chemicals; resistance of materials to penetration by liquids
- EN 369 – Protective clothing: protection against liquid chemicals; resistance of material to permeation by liquids

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