CENTEXBEL-VKC

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Fotografie | Photographie | Photography : Marc Van Hove

CENTEXBEL-VKC

GENT | Technologiepark 70 | BE-9052 Gent | Belgium | +32(0)9 220 41 51 | gent@centexbel.be
KORTRIJK | E. Sabbelaan 49 | BE-8500 Kortrijk | Belgium | +32(0)56 29 27 00 | info@vkc.be
GRÂCE-HOLLOGNE | Rue du Travail 5 | BE-4460 Grâce-Hollogne | Belgium | +32(0)4 296 82 00 | g-h@centexbel.be

www.centexbel.be

CHANGING OF THE GUARD

After a career at Centexbel of almost 40 years, Daniël Verstraete retired on 28 February, 2021. In 1979 he graduated as a civil engineer in electro-mechanical engineering at the KU Leuven and began his career in the textile sector as maintenance engineer at Fabelta Zwijnaarde in 1980.

This turned out to be a short stop of merely one and a half years. The textile sector being in an economic crisis at that time, Daniël, as the youngest engineer, was disposed of. However, the Fabelta director knew the then director of Centexbel, Mr Stryckman, and put in a good word for him. Daniël was invited to take an entrance exam at Centexbel and was given a research file to show what a mechanical engineer could do with it. Daniël improved the calculations in the file and was promptly put on Centexbel's payroll!

Daniël was involved in the first European projects of Centexbel and was able to close his career in a circular way with the Interreg RETEX project.

He also had to set up the measuring devices for the Kawabata test and was allowed to buy 5 devices for Centexbel, each one of them costing as much as a VW Golf GTI.

Being an excellent problem-solver, Daniël became a liaison officer (later called a consultant) to the industry. In his unique and inimitable style, he performed many consulting assignments for the industry for which he called upon the expertise of all Centexbel labs. Every two years, he acted as the Centexbel booth manager at the largest biennial textile fair in Frankfurt, Techtextil, where he successfully placed Centexbel on the international map.

Finally, Daniël was the contact person involved in the testing of Relief Products (UNHCR, Red Cross), a job requiring both a thorough knowledge of these very specific tender procedures and requirements and the diplomatic skills to occasionally break the bad news about failed test results to producers from all over the world.

Did we cover all his activities? Not by far and we are sure that many of you will have some striking anecdotes to tell about Daniël.

Daniël's successor, Patrice Van Butsele, looks forward to meeting you as your new Centexbel consultant "Technical Textiles, Interior Textiles & Upholstery".

Patrice has already a long career in textiles. As a Centexbel consultant, he will be advising the industry on technical textiles, as well as on interior textiles and upholstery.

You can contact him for testing possibilities, problem solving and research projects.

Email pvb@centexbel.be
Phone +32 9 243 82 15
Mobile +32 473 71 15 92

TECHNICAL TEXTILES represent a rapidly advancing market. Worldwide, about 60% of technical textile products are produced with fibres that have been developed within the last 50 years. While nearly 20% of technical textiles are based on natural fibres such silk, cotton, and wool, the remaining 80% is made from man-made fibres such as nylon, polypropylene (PP), and viscose. Over the past few years, technical texile (yarn) producers have begun to make the transition to a circular economy.

In 2013 the European Economic and Social Committee[1] concluded that

- The sector of technical textiles which registered positive economic and employment trends in the EU is an example of "traditional sectors" able to "reinvent itself" on new business models fully suited to the needs of the new industrial revolution (more smart, more inclusive and more sustainable).
- Textile Materials and Technologies are key innovations that could respond to a huge variety of societal challenges. Technical textiles are enablers in other industries by proposing and offering:
  - alternative materials: light-weight, flexible, soft, (multi)functional, durable;
  - new technologies: flexible, continuous, versatile;
  - functional components reliable, multi-functional, cost-effective, user-friendly parts of larger technology systems and solutions.

Technical textiles can be seen as part of a wider field of "engineering of flexible materials", including foams, films, powders, resins and plastics.

Technical textiles can be divided into many categories, depending on their end use. The classification system developed by **Techtextil, Messe Frankfurt Exhibition GmbH** specifies 12 application areas:

Agrotech	**Buildtech**	**Clothtech**	**Geotech**	**Hometech**	**Indutech**
Medtech	**Mobiltech**	**Ecotech**	**Packtech**	**Protech**	**Sporttech**

This list has to be completed with **Smartech** (Smart Textiles) to cover the field of wearable computers (e-textiles) and responsive textiles.

Technical textile development include both **advanced yarn systems** and **textile formation methods**. The obtained products are further transformed by coating, dyeing, finishing, assembly and/or composite formation techniques. Because technical textiles are primarily designed and developed in view of their application field (function or purpose), the focus is on "**performance**".

In Belgium and in Europe as a whole, the technical textiles sector is one of the main pillars of the textile industry. 2020 shows a slight slowdown in activities, which can undoubtedly be attributed to the impact of the coronavirus on the overall economy.

BELGIUM : KEY FIGURES 2020[2]	
Number of companies or business units	**79**
Number of employees	**7 300**
Turnover (in million euros)	**1 897**
Export ratio	**70**
Trends in activity in 2020 (in volume)	**-9%**
Share in total added value of the Belgian textile sector	**42%**

The technical textile sector is undergoing significant industrial change with the growing importance of new applications (medical, sport and leisure, aeronautics, environment), and the implementation of composite formation, nonwoven technologies, 3D-printing in addition to traditional textile technologies (knitting, weaving, braiding).

1 https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/technical-textiles
2 source Fedustria https://www.fedustria.be/textiel-hout-meubel-industrie/textielindustrie/technisch-textiel

TECHNICAL TEXTILES - SWOT ANALYSIS[3]

STRENGHTS	▪ an increasing level of R&D and innovation within the companies, whatever their size; ▪ efficient collective tools to support innovation at national level (textiles clusters, R&D centres), particularly in Germany, France, Belgium, Italy, Spain, Netherlands, Poland; ▪ efficient collective tools at EU level: the T (Textile) and C (Clothing) technology platform with many collaborative projects that have led to cross-fertilisation between applicative markets, textile companies and researchers; a European network involving the main textile technology institutes (Textranet) university networks (AUTEX) as well as a network involving the main innovative textiles regions; ▪ EU leaders in growing markets; ▪ leading position of the EU in textile machinery manufacturing with 75% of the global market; ▪ the diversity of end-uses which is an asset in a period of low growth; ▪ a strong encouragement for personal protective equipment (PPE) considered by the EC as one of the six leading markets; ▪ better financial ratios in general than the other textiles and clothing companies (more value-added per employee, higher cash flow, higher level of margin ...); ▪ control of the leading worldwide trade fair (Techtextil).	OPPORTUNITIES	▪ growing needs of textiles solutions from the end-users: comfort and monitoring solutions for active life style, carbon emission reduction in transport (through reduced weight) and building (through thermal insulation), improvement of medical technology (nosocomial disease prevention, implants, health monitoring) ...; ▪ close cooperation between producers and customers in order to address very specific needs ("tailor-made solutions") and demand-driven innovation; ▪ growing demand for recyclability improvement, like for instance the replacement of foam by nonwovens, composite materials and in-vehicle cabin air filters; ▪ quick growth of technical textile consumption per capita worldwide and especially in China, India and Brazil.
WEAKNESSES	▪ small and medium-sized companies with limited capacity for investment; ▪ more difficult access to credit; ▪ lack of attractiveness of the textile industry for young graduates; ▪ decline in production of natural and man-made fibres in the EU, leading to difficulties in innovating with the low number of grades of fibres available and an increasing risk of dependencies on imports; ▪ at the moment low recyclability of technical textiles compared to traditional materials; ▪ a high energy-intensive industry; ▪ specialisation on mature applicative markets, such as Mobiltech (with the critical situation of the EU car manufacturing industry) or Hometech particularly for carpets, furnishing fabrics and mattresses.	THREATS	▪ scarcity of raw materials and increasing prices (mainly synthetic, regenerated or inorganic fibres, polymers, spun yarns and filament yarns); ▪ increase in energy costs (gas and electricity) in the EU that could lead to a relocation in the United-States or in Asia of the production plants for the more energy-intensive producers (man-made fibres, non woven, dyers and finishers ...); ▪ growing competition from emerging countries and increasing market access barriers to those countries. Asia is already the first production region in tonnage in 2010 having multiplied by 2.6 times its production value; ▪ growing pressure on prices, particularly on mature markets; ▪ increasing risk of counterfeiting and copies.

SUSTAINABLE PRODUCTION AND PRODUCTS

In general there is a growing trend to implement more sustainable production processes, to develop bio-based technical textiles and to use recycled content.

Dyneema® who recently developed a bio-based technical fibre, claims[4]:

> *"In line with our commitment to a sustainable future, we have developed the first ever bio-based ultra-high molecular weight polyethylene fibre. Sourced from renewable, bio-based feedstock, our newest innovation in fibre technology uses the mass balance approach to help further reduce our reliance on fossil fuel resources.*
>
> *ISCC certified, bio-based Dyneema® fibre will help our partners and customers reduce their carbon footprint and contribute to the circular economy, while continuing to rely on the same trusted performance of the world's strongest fibre™.*

Sustainable growth means an energy and resource-efficient economy with a capacity to meet its commitments in the fight against climate change and upcoming resource scarcity. The former is usually coined as "low-carbon economy", which refers to reducing CO_2 emissions.

The technical textiles sector can contribute proportionally to a sustainable growth by:

- reducing emissions of CO_2 thanks to lighter materials in transports (composites for aeronautics and carbon fibres for cars);
- offering concrete textiles solutions, for example in the fields of filtration, reinforcement and insulation for improving the energy efficiency in the housing and building sectors;
- using recyclates for fibre production.

3 source: https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/technical-textiles
4 https://www.dsm.com/dyneema/en_GB/sustainability/bio-based-dyneema-fibre.html

CENTEXBEL SERVICES TO TECHNICAL TEXTILE COMPANIES

RESEARCH PROJECTS

To make the switch to a sustainable sector, Centexbel assists the technical textiles industry to:

- consider eco-design when designing products and ways of production;
- perform life-cycle assessments (LCAs) of their products, which will play an increasingly important role in the future because until now traditional materials like metals are often cheaper to recycle.
- develop recyclable carbon fibres based on natural fibres;
- optimize recycling methods allowing the complete recycling of textiles consisting of blended fabrics, including separation techniques to remove legacy chemicals

Our research offer includes both collective (multi-client) and private research projects.

List of ongoing collective projects: https://www.centexbel.be/en/projects

More info and funding opportunities for private research projects: https://www.centexbel.be/en/contacts

NETWORKING

Since 2019, the Technical Textiles working group is active again, a cooperation of Fedustria and Centexbel. Its aim is to strengthen the network of companies active in technical textiles and to promote knowledge exchange on new innovations.

The working group technical textiles focuses on innovations in view of "a circular economy", as well as on bio-based developments and recycling. Sander De Vrieze, representing Centexbel within this open working group kindly invites all Technical Textiles companies to join!

JOIN THE TECHNICAL TEXTILES WORKING GROUP - FREE OF CHARGE

https://www.centexbel.be/en/form/technical-textiles-wg

THE PROTECTION OF INTELLECTUAL PROPERTY RIGHTS (IPR) INSIDE AND OUTSIDE THE EU

SMEs generally underestimate the value of their intangible assets. The Centexbel Patent-cell helps them to protect their Intellectual Property Rights (IPR), especially in the field of patents, by means of consulting, training sessions and by dissemination information on a regular basis during the Centexbel Horizon exploration sessions, through newsfeeds on the Centexbel website and on LinkedIN and of course through the monthly PatentAlerts included in the electronic INFO newsletter.

Follow the Centexbel PatentAlerts and Patent Newsflashes on LinkedIN

STANDARDS-CELL "TECHNICAL AND FUNCTIONAL TEXTILES

Technical textiles are high-performance textiles that require special functionalities. The market of technical textiles is expanding as the products are being put to an ever-increasing number of end uses in various industries. What is relatively new is a growing recognition of the economic and strategic potential of such textiles to the fibre and fabric manufacturing and processing industries.

The technical textiles supply chain is a long and complex one stretching from the manufacturers of polymers for technical fibres, coating and specialty membranes, through the converters and manufacturers who incorporate technical textiles into finished products and use them as an essential part of their industrial operations.

There is constant need to develop products and applications, invest in new processes and equipments and market to an increasingly diverse range of customers. To assure a level playground, international standardization organisations (ISO, CEN, ASTM) create new standards and revise existing ones to allow for these new developments.

The Centexbel Standards-cells allow you to follow the standardization activities from the front row!

Contact: Karin Eufinger | ke@centexbel.be

TESTING TECHNICAL TEXTILES

As functionality, reliability and durable performance are key to technical textiles, Centexbel offers a large variety of testing methods to evaluate the properties of technical textiles used in high-demanding applications. In this article, we will highlight a selection of tests.

Overview of testing @ centexbel : https://www.centexbel.be/en/testing

Download our testing brochure : https://www.centexbel.be/en/brochures/centexbels-testing-facilities

Physical lab: Lies Alboort | lia@centexbel.be (Gent) & Jean Léonard | jle@centexbel.be (Grâce-Hollogne)

Burning behaviour lab: Mike De Vrieze | mdv@centexbel.be

Chemical lab: Eddy Albrecht | ea@centexbel.be

UV AND WEATHERING RESISTANCE

Materials are inclined to degrade to a lesser or greater extent under the influence of weather conditions. This process can lead to the deterioration of certain material properties or aspect changes, including decoloration, yellowing, loss of lustre/gloss, delamination, loss of strength and corrosion, some of them having an impact on performance and safe use.

https://www.centexbel.be/en/testing/accelerated-aging-tests

The testing appliances described on the above webpage submit a material to a series of accelerated weathering conditons, including heat, moisture, different forms of radation including UV light, simulating real-life impact of exposure. The test specimen will then be submitted to other test to measure the impact of this exposure on relevant properties (mechanical, chemical, biodegradation (geo- and agrotextiles), etc.).

These tests are also very useful for product development and reseach purposes.

ABRASION RESISTANCE

The wear or abrasion resistance of textiles is of importance for clothing, furniture as well as for technical textiles. Wear or abrasion might initially “only” influence the appearance, but eventually lead to the destruction of the textile product. Apart from the pure mechanical damage of the fibre, the influence on certain properties could be problematic. Abrading a finishing from the surface of a fibre will affect the property that was intentionally confered to the textile (e.g. water repellency, FR).

Different testing methods are established to test and/or predict the durability of textiles and its finishings as well as to test modifications improving the durability, which simulate a mechanical and/or abrasive long-term stress. One of the most important tests for apparel and home textiles is the Martindale abrasion test according to EN ISO 12947-1.

Applying a specific weight loading, a standard test fabric (made of wool) is rubbed across the textile sample’s surface. The degree of abrasive wear is controlled at given time intervals and judged by the occurrence of a visible damage of fibres of the test sample. The test allows to evaluate the suitability of different products or materials for numerous applications with respect to wear resistance. Seat covers for furniture in private use should withstand 15,000 rubbing cycles without any damage, while those used in workplaces have to guarantee a higher durability and should last for at least 35,000 cycles.

After performing the abrasion test, the treated samples can be investigated to obtain insight into the damaging mechanisms. Centexbel uses Scanning Electron Microscopy (SEM) and digital microscopy to determine the damage and to detect the damaging mechanisms.

The martindale abrasion test is also used to evaluate the abrasion resistance of protective gloves

https://www.centexbel.be/en/testing/abrasion-resistance-protective-gloves

RESISTANCE TO COMBINED SHEAR FLEXING AND RUBBING

EN I SO 5981:2007 specifies how to evaluate the resistance of rubber or plastic coated fabrics to combined shear flexing and rubbing.

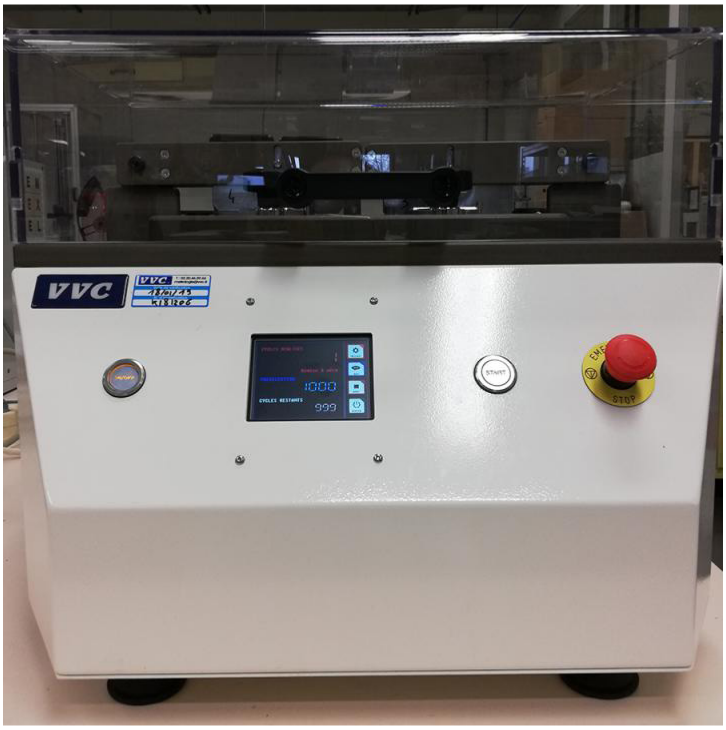
A test piece is subjected to a succession of mild abrasive rubs applied to a continuously changing pattern of folds created by a rubbing machine. The damage caused to the test piece is assessed visually.

- each test piece is submitted to 2000 rubbing cycles on a machine with two parallel clamps giving counter-reciprocating motions and a foot pressing on the flexing part of the test piece.
- six test pieces, three in the longitudinal direction and three in the transverse direction are submtitted to the test.
- if the fabrics are coated on both sides, 12 test pieces are submitted to the test so as to assess each side.

The type(s) and degree of change are assessed visually:

- holes, cracks
- surface abrasion and its depth
- separation of support and coating, or separation of different layers
- permanent creasing, etc.

The changes are evaluated directly or by comparison with a test piece of reference material.

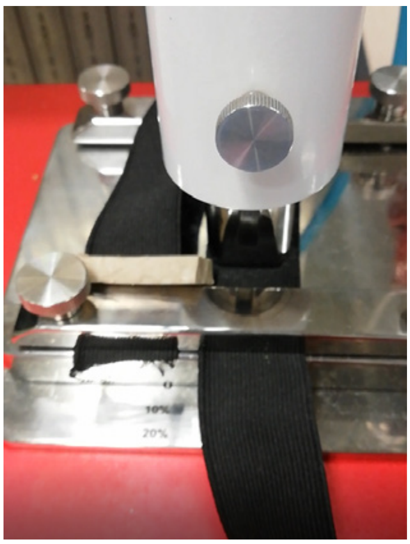


https://www.centexbel.be/en/testing/flexometer-scrub-test

FASTNESS TO RUBBING

RUBBING FASTNESS TESTER (TF414 IULTCS)

Designed to carry out rub fastness tests on the surface of leather and to assess the amount of colour transfered from the sample to the rubbing pad under dry or wet conditions, this device is also useful to determine the degree of deterioration of the surface of technical textiles, under the influence of rubbing..



Specifications

- Rubbing finger 500 +/- 25 g
- Loading weight 500 +/- 10 g
- Dimension of base of finger 15 x 15 mm
- Specimen 120 x 20 mm
- Rubbing stroke 35 ~ 40 mm
- Speed of rubbing 40 +/- 2cpm
- Counter 1-999,999 times, automatically stops

LIMITING OXYGEN INDEX (LOI) TEST

The Limiting Oxygen Index (LOI) test is a simple method that is widely used to quickly screen the flammability of materials. The method has been standardized in ASTM E2863 and ISO 4589.

LOI is defined as the minimal O_2 concentration if the O_2/N_2 mixture that maintains flame combustion of the sample for 3 min, or consumes a length of 5 cm of the sample. The sample is placed in a vertical position (see pictures below), and the top is ignited with a burner.

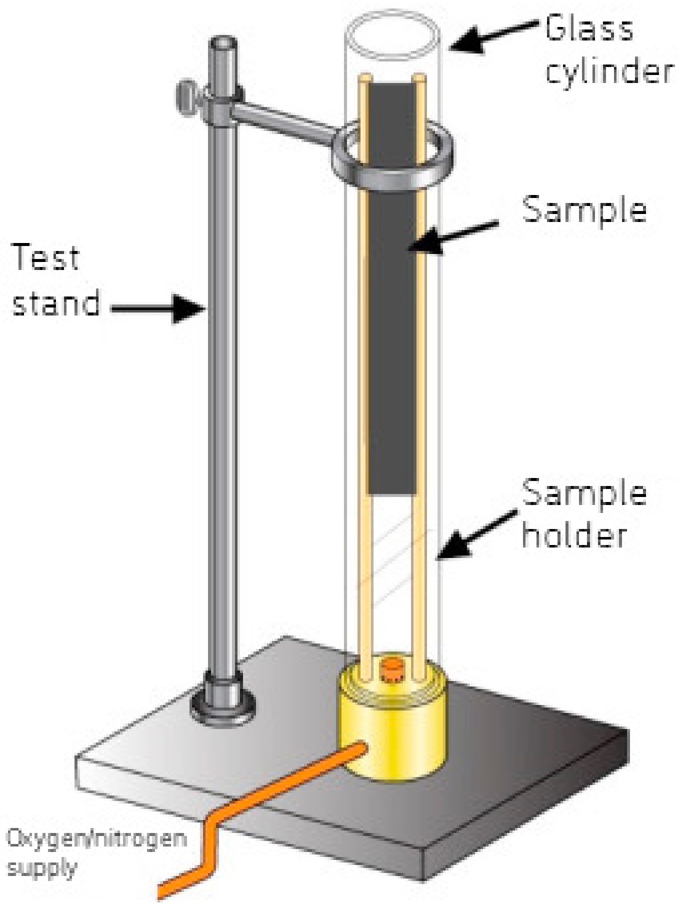
Generally, low LOI indicates highly flammability of materials, while less flammable materials have high LOI.

Examples of LOI values of some commonly used fibres:

FIBRE	LIMITING OXYGEN INDEX	IGNITION TEMPERATURE (°C)	EASE OF IGNITION
Polyvinyl chloride (PVC)	35-40	575	Flame resistant
Wool	24-25	590	Will not ignite readily
Polyester	20-23	485	combustible
Acrylic	18-20	390	combustible
Polypropylene	17-18	350	Burns easily
Cotton	18-21	390	Burns easily

DISCOVERED CORRELATION!

While performing a series LOI tests on knitted textiles made from technical yarns, Centexbel discovered the correlation between a low LOI value and the amount of loose fibres of the samples, indicating that LOI tests can be used as a method to characterize the hairiness of technical textiles.



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PERMEATION RESISTANCE TO CHEMICALS

There are many chemicals causing adverse effects on the (unprotected) skin ranging from contact dermatitis to permeation of the skin and systemic toxic effects.

ISO 374-1 Protective gloves against dangerous chemicals and micro-organisms - Part 1: Terminology and performance requirements for chemical risks - is the product standard comprising amongst others the testing standard EN ISO 16523 - Determination of material resistance to permeation by chemicals - part 1: Permeation by liquid chemical under conditions of continuous contact.

Permeation is a process by which a chemical moves through the material on a molecular level, involving

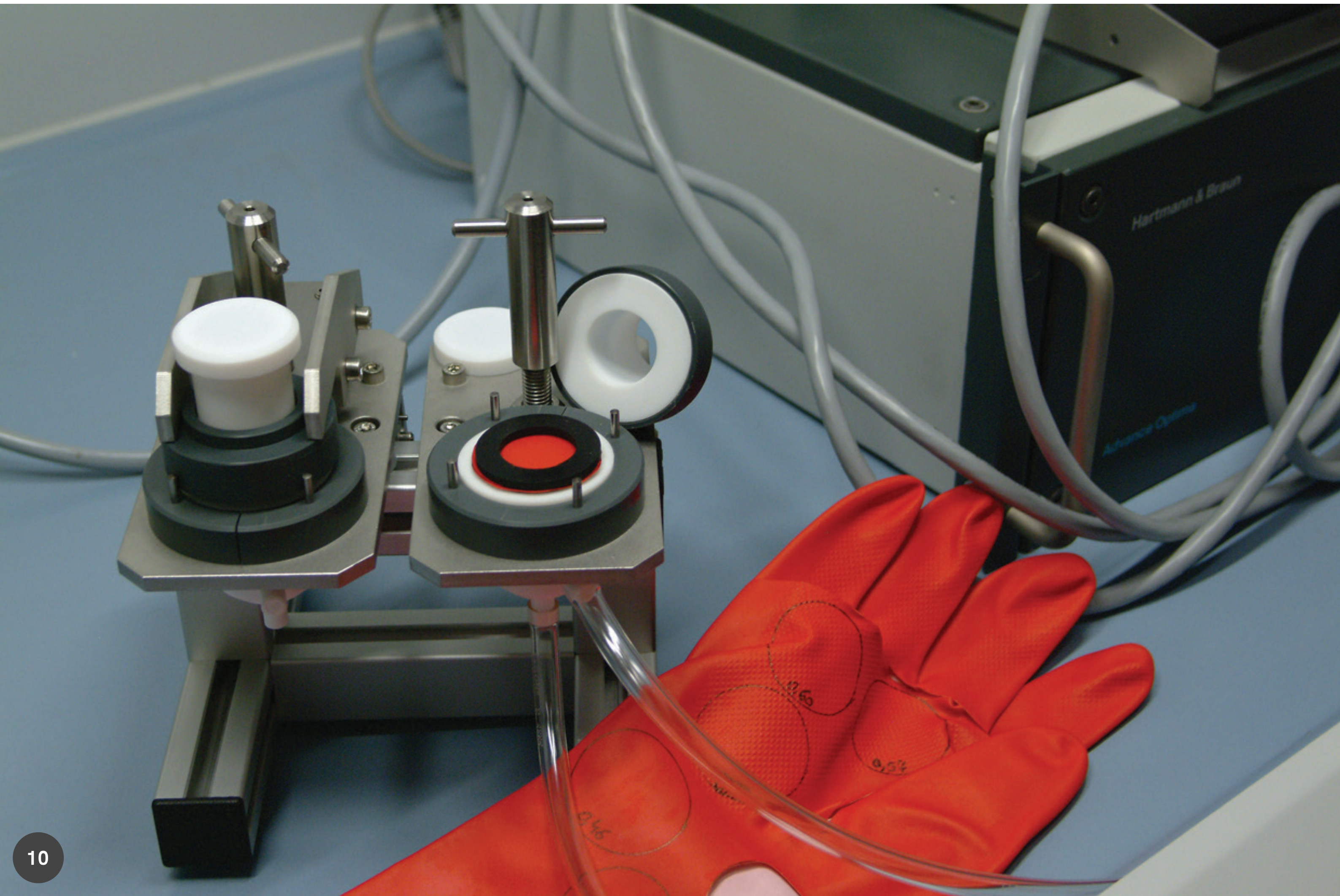
- the absorption of molecules of the chemical into the contacted (outside) surface of a material
- the diffusion of the absorbed molecules in the material
- the desorption of the molecules from the opposite (inside) surface of the material

The test specimen is mounted between the two halves of the permeation cell. The outer surface of the protective clothing, glove or footwear material is brought in contact with the challenge chemical. The permeation cell is placed in a temperature controlled room, cabinet or water bath at (23 ± 1) °C. The detection equipment is connected and the collecting medium is connected to the cell. The flow and/or stirring is adjusted to the required rate.

The concentration of the chemical in the collecting medium is measured periodically or continuously.

The NBT (normalised breakthrough time) has occurred when the permeation rates of the challenge chemical reaches the NPR (normalised permeation rate).

https://www.centexbel.be/en/testing/permeation-test



IMPACT RESISTANCE

In a matter of seconds, a situation can escalate from a small bump on the hand to a life-altering injury. To meet the newest materials used in the manufacturing of protective gloves, the range of standard test methods has been updated (EN 388:2016) and extended to include the impact test as described in EN 13594, to enable workers to make an informed decision about the performance levels of the gloves they need.

MORE TRANSPARENT INFORMATION LEADS TO SAFER WORK ENVIRONMENTS AND FEWER INJURIES

The impact protection on the back of the hand of protective gloves is tested according to EN 388:2016 that includes an impact resistance test in accordance with clause 6.9 of EN 13594.

IMPACT PROTECTION IS ONE OF THE REQUIREMENTS OF PROTECTIVE GLOVES ACCORDING TO EN 388:2016

To pass the test, the transmitted force shall be less than or equal to 7 kN (kilonewton) and no result shall be greater than 9 kN. When a glove has passed the test, it means that the protective material successfully and safely dissipates the forces away from back of the hand.

https://www.centexbel.be/en/testing/impact-tester-ppe-gloves

A 2,5 kg striker with a flat impactor face is raised to a height that will provide the required impact energy of 5 J (± 0,1 J) when touching the test piece.

Striker hits the test spot

After releasing the impactor, the peak force is recorded.

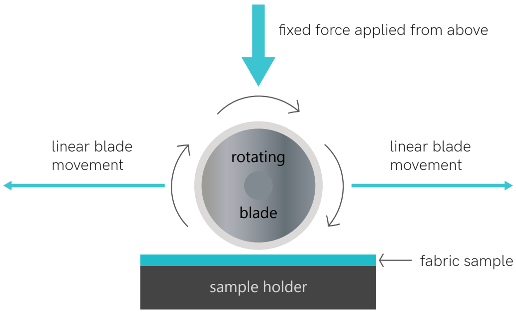
CUT RESISTANCE

EN 388 is used to regulate protection classes of cut restistant safety gloves. To achieve a high level of cut protection, several technical materials – known as high performance fibres – are used. Testing procedures and product classifications are adapted to reckon with this continuous process of product and material developments. The Centexbel laboratory is equipped with the required measuring technology to conduct tests in accordance with both the EN 388 "Coupe test" and the ISO 13997 "Cut resistance test".

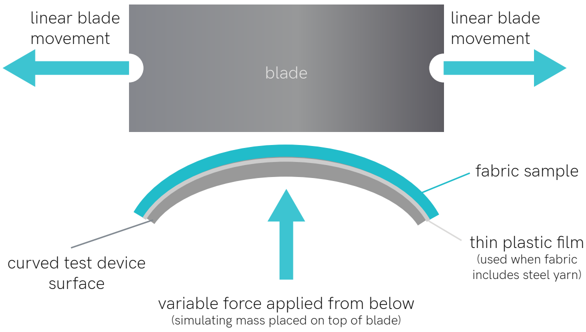
https://www.centexbel.be/en/testing/cut-resistance-protective-gloves

EN 388 COUPE TEST

- sampling area: palm of the glove
- linear movement of a rotating knife over the sample until the fabric is cut through
- introduction of reference material (typically cotton)
- altenration of sample and reference material until at least 5 results are registered
- loss of sharpness of te knife is compensated by cutting the reference material before and after the sample
- cut resistance is determined by the number of cycles needed to cut trhough the sample related to the reference material



EN 388: 2016 includes an additional cut resistant test according to ISO 13997 that is suited to evaluate new high performance fibres used in the production of protective gloves.



ISO 13997

- a fabric sample is fixed on a curved testing device and a force from beneath is applied
- the knife sharpness is calibrated after each completed cycle or when the knife has cut through the sample
- the cut-through is established when an electric contact is observed between the knife and the testing device
- if the sample contains any metallic yarns, a plastic film is placed between the testing device and the fabric to prevent electric contact initiated by the fabric
- the sample is submitted to a minimum of 20 cutting movements applied with variable forces
- the distance that is covered to cut through the material is measured
- the data are used to establish the force that is needed to cut through the fabric

ULTRAVIOLET PROTECTION FACTOR (UPF) OF TEXTILES

With its Solar Light's Ultraviolet Protection Factor (UPF) Analyzer, SPF-290AS, Centexbel determines the UPF values of sun protecting fabrics and clothing.

SPF ANALYZER 290AS

The Solar Light's versatile SPF-290AS UV Transmittance / Sunscreen Protection Factor Analyzer is an integrated UV spectrophotometer to determine the SPF values of textiles and clothing materials.

Covering both the UVB and UVA spectral regions, the system automatically scans from 290 to 400 nm, accumulating and storing data at intervals of 1, 2, or 5nm.

The monochromatic protection factor (MPF) is determined for each of the selected wavelengths, and used to calculate the SPF value, using solar irradiance and erythemal constants that are programmed in the software.

PRINCIPLE

The Ultraviolet Protection Factor (UPF) of textiles is tested according to the Australian/New Zealand Standard AS/NZS 4399, European standard EN 13758-1, or the American Standard AATCC TM 183.

UPF is an indication of the UV protection provided by textiles in view of the spectral composition of the sunlight and the human skin sensitivity.

The Australian/New Zealand Standard (AS/NZS 4399) simulates the solar spectrum of Melbourne, Australia.

The European EN 13758-1 and the American AATCC TM 183 standards apply the solar spectrum of Albuquerque, USA, where the solar radiation is similar to that of Southern Europe.

Depending on the UPF level that is measured, the textiles are graded from "Minimum" (UPF 15), over "Good" (UPF 30) to "Excellent" (UPF 50, 50+).

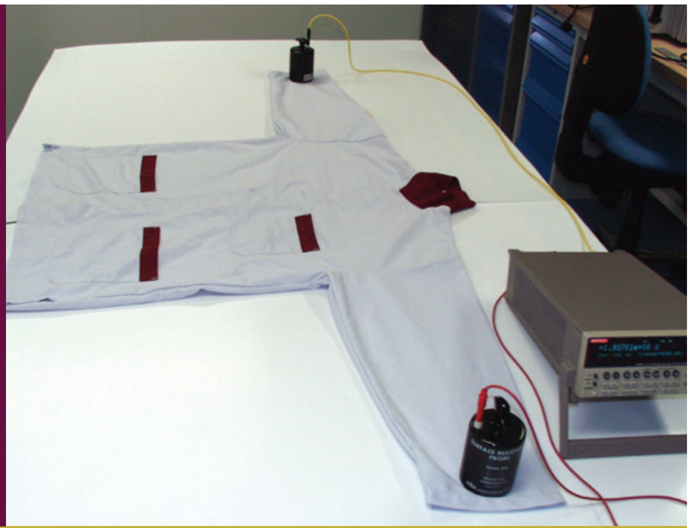
https://www.centexbel.be/en/testing/ultraviolet-protection-factor-upf-textiles

ELECTROSTATIC SAFETY

https://www.centexbel.be/en/testing/electrostatic-safety

Electrostatic measurement

- surface resistance
- resistivity
- point-to-point resistance
- earth resistance
- discharge time
- discharge time by induction
- efficiency of electrostatic insulation



Climate room with atmospheric control

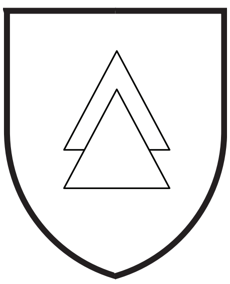
- temperatures between 19 and 26 °C
- relative humidity between 10 and 60 %

The room of $50m^3$ is insulated against electric perturbations and is used to characterize the electrostatic behaviour of protective clothing, clean-room clothing, carpets, coatings, etc..

ELECTRIC ARC FLASH

An arc flash is the result of energy that is released rapidly due to a fault between two electrodes. This energy release occurs during short circuit conditions. The flash quickly passes through the gap, or fault.

IEC 61482-2 is the overall standard covering protective clothing against thermal arc hazards of an electric arc. This standard also covers various aspects of the garment design. Garments complying with all of these requirements should be marked with the IEC 61482-2 symbol as well as the level of protection it meets.



IEC 61482-2:
Class x

IEC 61482-1-1 Live working – Protective clothing against the thermal hazards of an electric arc – Part 1-1: Test methods – Method 1: Determination of the arc rating (ATPV or ^{E}BT50) of flame resistant materials for clothing. It determines the ATPV level (Arc Thermal Protection Value) of the garment. The basic principle is that the Garment ATPV must be higher than the Arc Flash energy level as calculated. The Arc Rating is expressed in cal/cm2

IEC 61482-1-2 Live working – Protective clothing against the thermal hazards of an electric arc – Part 1-2: Test methods – Method 2: Determination of arc protection class of material and clothing by using a constrained and directed arc (box test).

4 YEARS' PROJECT ON PIEZO-PLA OPENS MANY PERSPECTIVES

Birgit Stubbe | bst@centexbel.be

Cédric Samuel | Project Coordinator | cedric.samuel@imt-lille-douai.fr

The partners of the BIOHARV project organised their closing event on 3 February 2021. The event addressed the innovations in electroactive polymer materials and the prospects of this collaborative project between France, Wallonia, and Flanders.

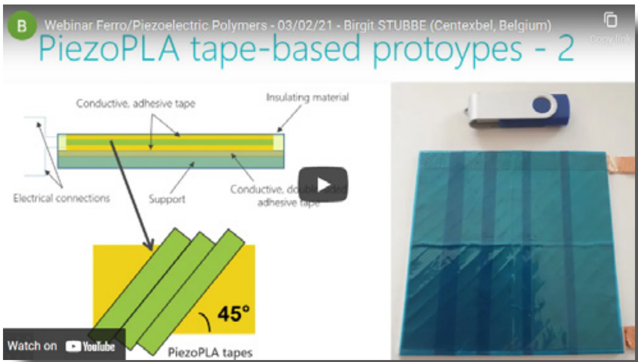
Started at the end of 2016 and coordinated by IMT Lille Douai, the BIOHARV project has enabled the development of solid cross-border expertise on piezoelectric bio-based polymers of the PLA[1] type, ranging from its transformation by plastics/textile processes to the characterisation of electroactive properties at various spatial scales.

Unique piezoelectric properties have been demonstrated for this functional material, which is an alternative to PZT[2] and PVDF[3] ceramics, with an innovative combination of environmental performance and drastically reduced material/manufacturing costs without neglecting technical performance.

Cross-border collaboration has also been crucial in proving application concepts on a laboratory scale (sensors, µ-energy generators, transducers, etc.). Many technical challenges obviously remain (advanced formulations of PiezoPLA, incorporation of flexible electrodes, textile versions, etc.) but a strong application potential is detected for these functional materials.

The potential of this material was notably discussed in a closing event organised on 3 February 2021 to define future R&D actions in collaboration with industrials to move towards more precise application markets in the near future. This webinar brought together some fifty academic and industrial experts on the emerging applications of piezoelectric polymer materials. It was a day rich in information on recent advances in functional polymer materials with many exchanges on these new technologies.

Application prospects are emerging for PiezoPLA at the crossroads of connected objects, industry 4.0, biomedical and emerging manufacturing technologies with structuring actions to be prospected in the FWVL INTERREG zone and on a European scale for a rapid implementation of these technologies by the industry. To be continued in the coming months.



WEBINAR CLOSING EVENT:

The webinar was recorded and all presentations are available on: http://www.gotos3.eu/fr/nieuws/projet-bioharv-4-ans-de-collaboration-transfrontaliere-sur-le-piezopla-et-de-nombreuses-perspectives

Birgit illustrates Centexbel's contribution to the project in the following video: HTTPS://YOUTU.BE/YYVI2H6PLBO

1 PLA: Poly(lactic acid) or Poly(L-Lactide) - Bio-based piezoelectric polymer studied in BIOHARV
2 PZT: Lead Zirconium Titanate piezoelectric ceramics - Piezoelectric reference material
3 PVDF : Poly(vinylidene fluoride) - Piezoelectric reference polymer

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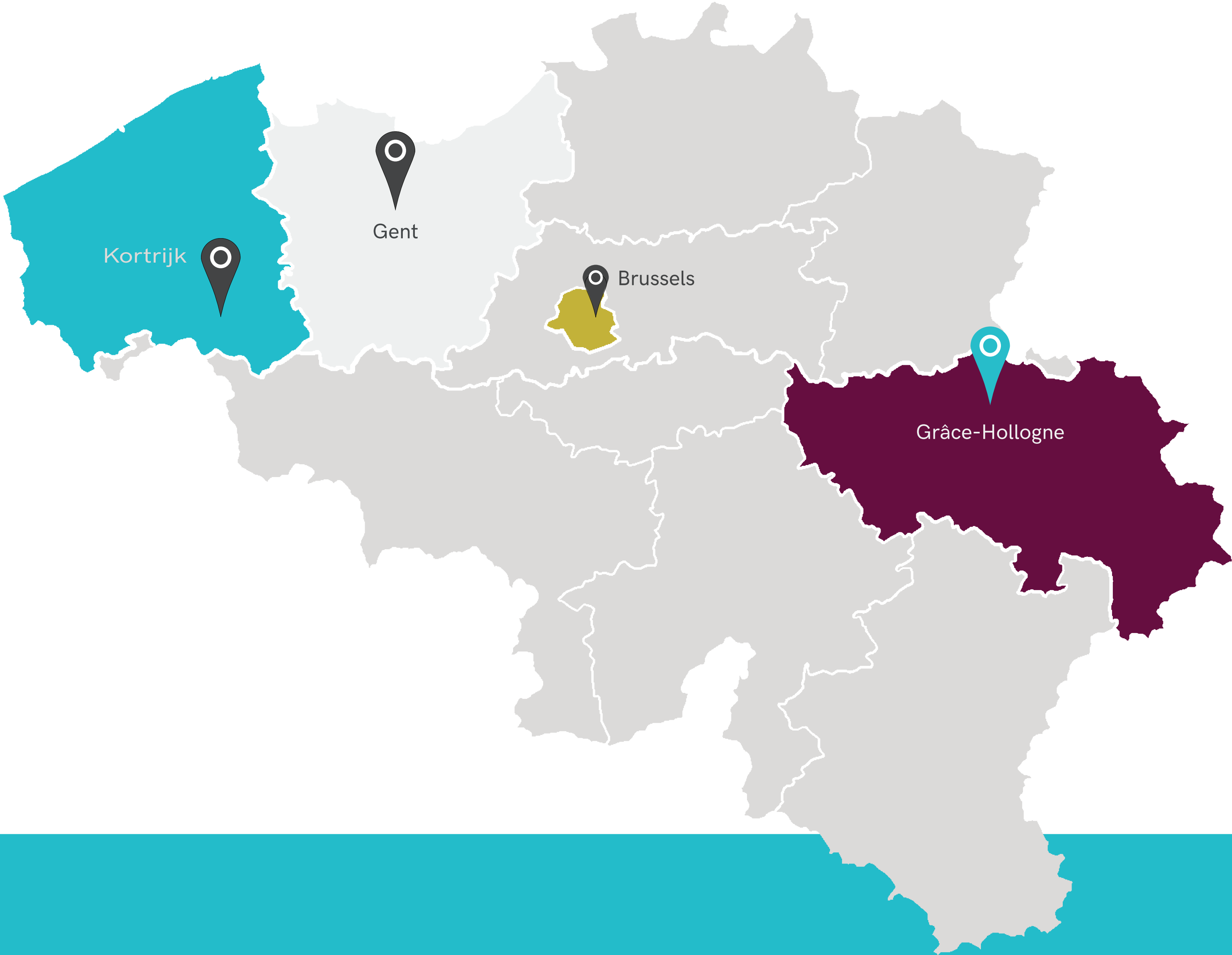

Centexbel-VKC

GENT | Technologiepark 70 | BE-9052 Gent | +32 9 220 41 51 | gent@centexbel.be
KORTRIJK | E. Sabbelaan 49 | BE-8500 Kortrijk | +32 56 29 27 00 | kortrijk@centexbel.be
GRÂCE-HOLLOGNE | Rue du Travail 5 | BE-4460 Grâce-Hollogne | +32 4 296 82 00 | g-h@centexbel.be
www.centexbel.be