

2011 | number 1 | spring

**THEME: END-USER MARKETING**

# txtures



Royal Ten Cate (TenCate) is a multinational company which combines textile technology with chemical processes in the development and production of functional materials. Various market applications have been created around this technological base. TenCate occupies leading positions worldwide in its core markets.

TenCate's growth is based principally on global trends, namely, safety / protection and sustainability / the environment. TenCate materials are principally used for:

- personal safety and the protection of living and working environments;
- modernization of military and police equipment
- space and aerospace (reduction in fuel costs through lighter materials);
- water management and environmental protection;

TenCate's strategy is based on the concept of value chain management. The four cornerstones of this policy are:

- cost leadership;
- product differentiation, focusing on specific applications and customer requirements;
- end-user marketing and an industrial intellectual property policy;
- technological innovation.

These four cornerstones within the TenCate business model are related to market, product, process and technology, and their interaction.

In this spring edition, we highlight the efforts in general of TenCate in end-user marketing.

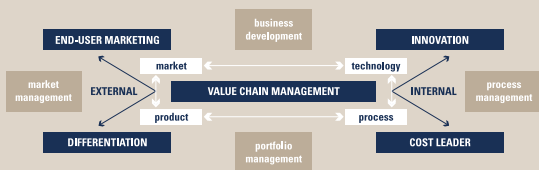
Cover photo: Production of composite materials at TenCate Advanced Armour in Vissenbjerg (Denmark)

# Connected through end-user marketing

**The theme of TenCate's 2010 Annual Report, which will be published on 22 March, is 'Connected through end-user marketing'. Marketing that is focused on the end-user is one of the four cornerstones of the TenCate business model, which was introduced into the company ten years ago. This cornerstone will be further highlighted in both the annual report and this edition of txtures.**

TenCate's strategic framework is based on four cornerstones: end-user marketing, product differentiation, cost leadership and technological innovation. The translation of customer needs into system solutions is one of the basic principles of end-user marketing. In addition, co-creation (the development of integrated systems together with the

customer) is playing an ever greater role. TenCate develops and produces materials with a wide range of characteristics, with the binding factor being the technologies, processes, patents, formulae, etc. behind them. TenCate materials are more and more often forming a part of integrated systems that combine materials or technologies.





### **Needs of end-users**

In the past few years the focus within the commercial process has gradually shifted from the direct customer, such as distributors, installers and designers, to translating the specific needs of end-users. These needs often have their origin in laws and regulations, standards and criteria. TenCate concentrates

on applications in which the materials used must comply with strict standards. Markets are usually regulated by government agencies when it comes to standards. This involves for example environmental or employment legislation. One of the key standards applies to the field of safety and protection. In most cases, where bidding and tendering are

concerned, the materials must meet strict specifications.

The transition to a more market-oriented organization has also resulted in the emphasis shifting increasingly towards the added value of revenues. Added value is also an important factor when it comes to having control within the value chain.

*Continued on page 4*

## CONNECTED THROUGH END-USER MARKETING (1)

Continued from previous page

### Internal collaboration

The result of this strategy is increasing internal collaboration in both technological and commercial fields. TenCate speaks of product-market-technology combinations. New, customer-oriented solutions can be achieved time and again through internal collaboration and by mobilizing and combining knowledge, particularly in the field of technology. Some examples of this include the three-dimensional weaving of synthetic turf systems and the successful launch of TenCate Tecasafe® Plus on the American industrial market and of TenCate Defender™ M on the European defence and police markets.

This more solutions-based approach also means optimizing marketing and sales activities. The re-sellers network of agents and dealers will increasingly be replaced by specialist salespeople and product specialists.

### Connection with the value chain

Connection with the market means connection with the entire value chain, for both upstream and downstream activities. TenCate is operating increasingly in networks within the value chain. This leads to the creation of collaborative relationships with for example OEMs (original equipment manufacturers), knowledge institutes, technology partners, suppliers, public sector bodies, companies with international operations and specialist companies in the field of water management and the environment, specialists in the processing of composite materials and companies that market synthetic turf concepts. Through its external focus and willingness to collaborate, TenCate intends to remain ahead of the field in technology. This is a guarantee for providing solutions both now and in the long term.

- **This cornerstone of the TenCate business model is further highlighted in TenCate's 2010 Annual Report, which has as its theme 'Connected through end-user marketing'**
- **Solutions can be achieved through internal collaboration and by mobilizing technological knowledge,**
- **Within TenCate a shift has taken place towards a more market-oriented organization, characterized by a solutions-based approach**

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The position of TenCate in the value chain







TenCate Protective Fabrics focuses in part on the industrial safety market segment. Protective fabrics from TenCate combine protection, a long service life, comfort and affordability



Theme of 2010 Annual Report

**CONNECTED THROUGH END-USER MARKETING (2)**







# End-user centre stage

**By listening attentively to what customers or end-users want, a company can come up with the solution to their problem. Talks with the end-user give rise to ideas that subsequently provide the impetus for innovation and product development. 'Increasingly the end-user is coming to see TenCate as a problem solver.'**

TenCate develops and produces solution-oriented concepts (materials, modules and systems). Its strategy is directed towards making customers aware of these concepts and their advantages through end-user marketing. To understand what motivates the end-users and to know what specifications and what quality and functional characteristics they demand of materials and systems, TenCate wants to be connected with them and thus exert influence on product specifications and customer wishes. Ultimately it's a matter of approaching the right people or organizations and specifying (spec selling) or establishing the product as the norm in order to ensure that the end-user asks for TenCate materials.

## **Problem solver**

According to TenCate Chairman and CEO Loek de Vries, end-user marketing – one of the cornerstones of the TenCate business model – can be viewed from two perspectives: the immediate customers of the company and the end customer. 'Within the industry, people using the term end-user marketing generally mean business-to-business marketing. End-user marketing means trying to understand what the end market wants. To be able to manage and control the value chain, it must be clear who the market customer is and what his objective is. A company does those things that benefit the end-user, such as product and technological innovation.'



TenCate assigns the end-user a central position in its thinking and transactions. In this way TenCate seeks to bring the company to the attention of the end-user, so that he sees TenCate as the one who can deliver the possible solution to his problem. 'The customer is then willing to share his problems with us, so that TenCate can come up with solutions to resolve these problems. Through this end-user marketing, TenCate creates a distinct profile of itself as a solution provider.'

#### **Specifications**

Another element of end-user marketing is spec selling: the selling of specifications. This technique fits in with the integrated system approach pursued by TenCate. And here too customer wishes are central. Starting with an existing product or system, TenCate wants customers to prescribe its materials in the end product. The immediate customer uses TenCate material and incorporates it in a larger system. One example of this is the application of TenCate composite materials in some Airbus and Boeing aircraft. A second example is flame-retardant fabric. 'The American army knows that TenCate leads the U.S. market in fire-resistant clothing. Up to 2005 there were problems with the flame-retardant capacity of military uniforms, but then came an invitation to talk to army command, the end market. The question was: "Can TenCate make a textile substrate that doesn't burst into flames after 20 seconds?" The result was TenCate Defender™ M. And we've been working together for five years now.' Because of the large demand, the countercyclical character of army orders, and because it is not known how long demand will last, TenCate outsources part of the production and camouflage printing of this fabric. At the same time the R&D departments in the Netherlands and the U.S. are working on product differentiation (weight classes, colours, stretch and other fabrics, etc.) and other applications, for example for

riot police, industry, the fire service and for fighting forest fires (market differentiation).

#### **Complementary elements**

A third example is TenCate GeoDetect®. TenCate is insufficiently known when it comes to sensor technology, but attentive listening to the customer who wants a dyke with an early warning system generates ideas regarding complementary elements that can be added to a TenCate product. 'This is cross-fertilization, or rather crossroads-fertilization: at the crossroads of functionalities and applications. 'Because end customers share their problems with us, ideas are generated – and this also applies to TenCate activities downstream and upstream in the chain. These ideas are

an impetus to generate new functionalities and patents, and consequently TenCate is gaining momentum. Of all the textile companies throughout the world, we have the most patents at our disposal – and increasingly we can outsource patents too.'

#### **'Smart marketing'**

Another example of end-user marketing relates to the name TenCate Technical Fabrics, which years ago was linked with an end product: a tent. With this 'smart marketing', the customer assumes that an end product with our materials is a TenCate product. As a result, the end customer – in this case the camper – asks the dealer for a tent from TenCate. Through joint labelling,





a promotion instrument for end markets, two different, independent brand names are attached to one product. The addition of the name TenCate is then a kind of guarantee of quality for the customer and provides extra attention value for both brands.

### Branding

End-user marketing can also be the marketing of a brand, a trademark. The TenCate trademark represents the company's identity. Since 2005 TenCate has conducted an industrial trademark policy based on an umbrella trademark architecture. The trademark policy is directed at end-user marketing and is connected with the cornerstone product differentiation.

'If the image of TenCate is positive – an innovative, technologically driven, solution provider – you get feedback from customers. This means, for example, that the customer says to his supplier: "You must get the materials from TenCate." The power of the TenCate corporate trademark lies in the fact that in end-user marketing we can always lean on other TenCate markets. For example, TenCate materials are used in satellites, naturally with the TenCate trademark (brand) attached. This gives the customer and end market confidence. The conclusion of the end-user is therefore: "The other materials will also be good." It is more important for us to display end products in our brochures than the materials that we

make. Using end products, the company can showcase itself in end markets.'

### Interaction

Not only can end-user marketing lead to innovation, but there is also interaction with product differentiation and technological innovation – two other cornerstones of the TenCate business model. When it comes to product development, it must be clear for which market the products are destined and what the customer is going to do with them. Product differentiation is fuelled by talks with the end customer. Furthermore, there is a relationship with cost leadership, the fourth cornerstone. What does this technological innovation mean for production costs? Can these be reduced in the process? By developing a new product demanded by the end market (spec selling) and simultaneously reducing costs, you create product champions, such as TenCate Tecasafe® Plus and the TenCate Tapeslide™ XP Blade. It can also be a better and cheaper version of a competitor's product. That's enterprise: thinking outside the box and seeing every problem as a challenge.'

- **TenCate presents itself to the end-user as the one who can deliver the possible solution to his problem**
- **Customer wishes are central in spec selling as part of the integrated system approach**
- **The power of the TenCate corporate trademark lies in the fact that it gives the customer and end market confidence in reliability and quality**

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The name TenCate Technical Fabrics was years ago linked with an end product: a tent. As a result, the customer more and more often asks the dealer for a tent from TenCate



# The future of textiles

**In the context of the European DigiTex project TenCate develops exclusive applications for innovative digital finishing processes. For this purpose TenCate collaborates with partners on new production methods and reliable digital processes. The results were presented at the final conference on the future of digital finishing for the European textiles industry. The conclusion was that digital inkjet technology will fundamentally change the world of textiles.**

At DigiTex there has been an innovative breakthrough. Digital printing and finishing will offer technological benefits, while Digital inkjet technology will enable new products with new functionalities to be produced. These new functionalities, which were tested within the DigiTex project, relate to antibacterial treatments, single-sided hydrophobic functions, systems for controlled release and special chromic functionalities. Considerable savings on water, energy and chemicals are also possible. The results of the DigiTex project were presented during the final conference, held in Bergamo and Grassobio (Italy) on 2 and 3 December 2010.

## **Knowledge base**

'In the DigiTex project the knowledge base was laid for digital finishing within TenCate', Alfons Wegdam (strategic & engineering director, Xennia Technology) told us. 'TenCate has also, of course, developed appropriate knowledge outside the project, through Xennia. Preliminary computer-driven concept studies were made. In practice – using working process models – the feasibility of digital finishing and of new functionalities were then demonstrated: product- and process-related applications, such as antibacterial treatments, controlled release of substances, dyes and coatings. In subsidized projects such as these, working process models may not result in a tangible product. However, a process will allow you to show how the future

product can be made and what knowledge is available in house. The next step is to actually carry out production.'

## **Ingredients**

All the ingredients are now present to convert the knowledge acquired within TenCate's industrial environment into a means of production and an initial product. In concrete terms, this is a ready-made machine and a fabric that has been digitally finished on it. TenCate Advanced Textiles is at an advanced stage in

the process to start on the installation of a machine in Nijverdal. First, the exact specifications are agreed and then the pilot process will be started. If this proves successful, the first test products can be put on the market. One example is a sun awning fabric with UV coating and a colour print.

## **Results**

Machine builder Reggiani Macchine demonstrated the results on 3 December in an industrial environment at its facility in Bergamo.







Alfons Wegdam, strategic & engineering director, Xennia Technology

This much became clear: digital inkjet technology will fundamentally change the world of textiles. This technology will provide an important foundation for future, sustainable production. It will give greater flexibility in the production process, ensure that products are of a higher quality, shorten machine runs and increase the level of automation. Mass customization will also become possible (customized manufacture of large volumes). At the same time the basis will be laid for new business models and great cost efficiency will be achieved. The reliability of

production processes will be enhanced, through, for example, the monitoring of substrate instability and fabric deformation, monitoring the quality of substrate intake and the print heads.

- **Digital inkjet technology will enable new products with new functionalities to be produced and savings to be made on water, energy and chemicals**
- **The technology will make mass customization possible, will lay the**

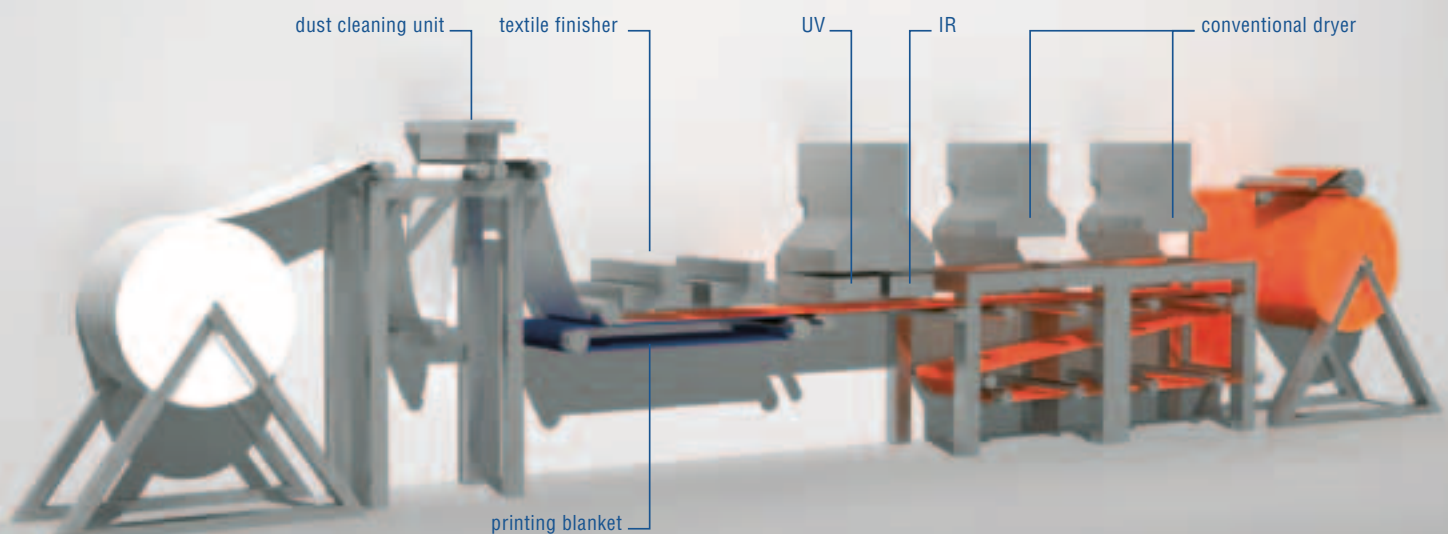
**foundation for new business models and produce cost efficiency**

- **In the DigiTex project new solutions have also been developed for more sustainable processes and increased environmental protection**

[www.tencate.com/news](http://www.tencate.com/news)  
[www.digitex-eu.com](http://www.digitex-eu.com)

Diagram of the digital textile finishing process

## TEXTILE FINISHING PROCESS



# Strong in material technology

As partner in the Innovation Route Twente, TenCate is involved in fascinating innovation and development projects in the region. TenCate participates in the Materials & High-Tech Systems cluster, one of the five promising economic concentration areas that have been defined. The results from such projects are generally revealed only years later. Innovation Platform Twente is in a positive mood. 'We're busy with good things.'

TenCate is a partner in the Innovation Route Twente, a cooperative alliance of government authorities (the province Overijssel and Region Twente), companies, education and research institutions. These four elements are represented in the Innovation Platform Twente (IPT). The main goal is to sustainably strengthen the Twente economy and stimulate employment through

innovation projects. The Innovation Route now consists of 50 projects with a total of €200 million in investments. Five clusters have been defined: Food, Technology & Health, Materials & High-Tech Systems, Safety & Technology, and Construction. TenCate participates in the Materials & High-Tech Systems cluster (see also page 15). Efforts are directed towards

qualitatively sound projects, bearing in mind the decreasing government budget when it comes to stimulating innovation.

## **Strength of the region**

The five promising economic concentration areas are in keeping with the strength of the region. Many small and medium-sized companies are active within these areas and considerable knowledge is present. 'Materials technology is strong in Twente, as can be seen at TenCate,' say Pieter Dillingh and Ron Nuwenhof, IPT programme director and cluster manager Technology respectively within the Development & Innovation unit of Oost NV, the Development Association for East Netherlands. With these new materials, the traditionally robust building sector in Twente could develop into a cornerstone of innovation. 'As Chairman of the Board Loek de Vries of TenCate said six years ago: "People must engage in a combination of market and technology." And again he's been proved right. It is also proof that we are busy with good things.'

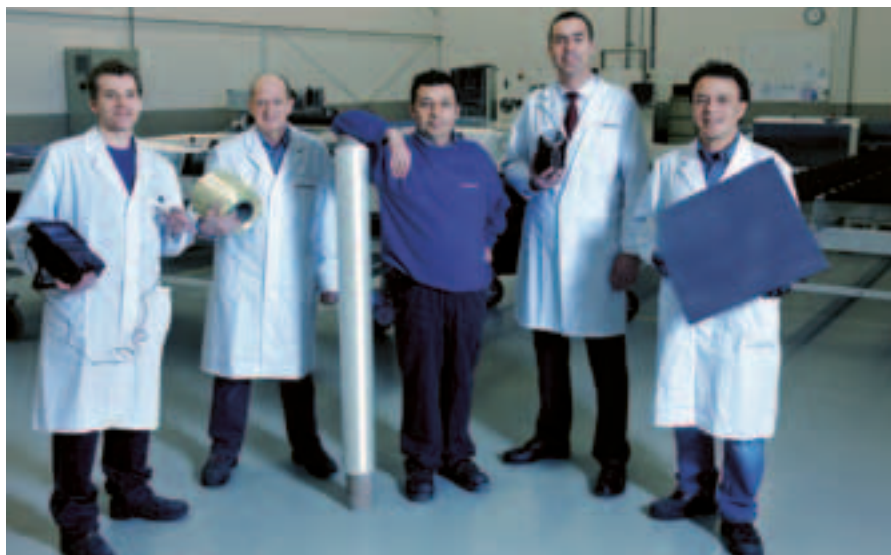
## **Continue to invest**

It has now become an oft-quoted expression of the Chairman of the Dutch Social and Economic Council, Alexander Rinnooy Kan: 'Whoever says





TenCate is strong in materials technology and advanced materials. TenCate Space & Aerospace Composites develops and produces composites and systems for space and aerospace applications. In the photo TenCate colleagues in Nijverdal: from left to right Stefan Wesselink (operator), Jan Raamsman (head of weaving department), Murtaza Buran (operator), Rob Boogert (plant manager) and Alex Flamand (operator).



that knowledge is expensive doesn't know how much stupidity costs'. If the Netherlands wishes to count as a knowledge economy, the government must continue to invest in education and research. And the ambition is there. Ron Nuwenhof and Pieter Dillingh agree on this whole-heartedly. 'You must keep innovation programmes alive. Furthermore it is important for the region of Twente to take a broader perspective and look at what is happening in the Eindhoven region, for example.' That the subsidies are decreasing is frustrating, but it does have one advantage. 'Less money has a refining effect. You are forced to concentrate more on the content. And this also applies to existing networks. Oost NV, the IPT and the Knowledge Park Twente have already strengthened their ties and work with greater focus on business-driven projects. By linking these networks effectively, we are more complete and more comprehensive in our service provision. This is all to the good as far as the content of projects is concerned. First they must be firmly rooted – and we're working hard on that.'

#### Added value

The different projects in which TenCate is involved add value to materials. Naturally

TenCate is well known to the companies operating within the chain, but 'our added value is in the project approach transcending the chain,' explains Ron Nuwenhof. 'Sizeable consortia are often built from SMEs, and research and education institutions, whereby we bring the parties together and fulfil a steering role.' The steering role in project finance and process management is highly appreciated by TenCate. 'The strength of TenCate in innovation projects lies in an open mind and the connecting role that it fulfils in regard to other companies. TenCate is a real puller in the region, and the regions have great need of such companies. My motto is: "If you can't divide, then you can't multiply". This saying fits TenCate like a glove – and the various co-creations are the proof.'

#### Concern

Last year the East Netherlands Audit Office expressed concern over the way in which the subsidies were deployed. There was also the matter of poor steering and limited information provision regarding progress and effects. According to Pieter Dillingh, this concern is unwarranted. 'It is certainly known where the money has been allocated – and that this was handled effectively. Every euro can be traced

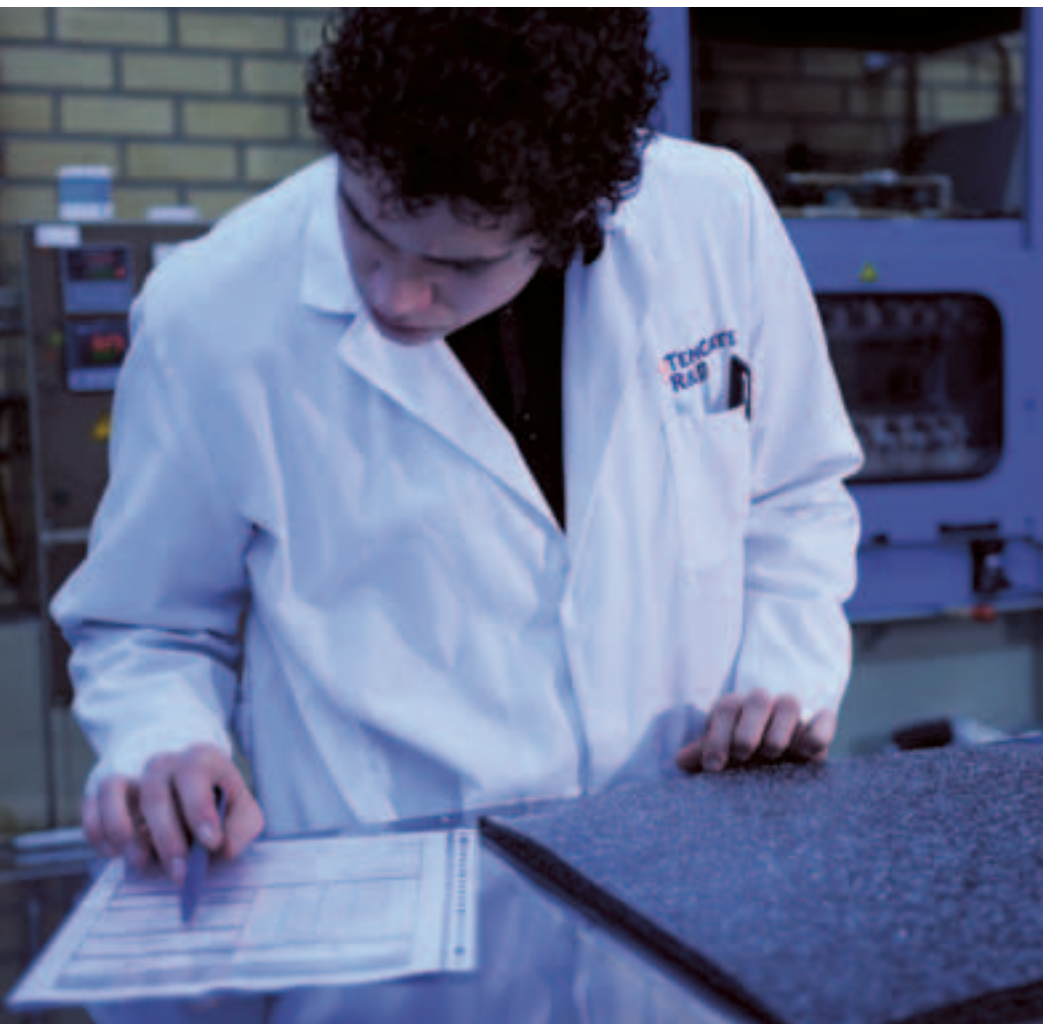
back. As programme bureau, the Innovation Platform itself plays no formal role in the distribution of resources. We give advice to the organization that hands out the subsidy.' They stress that often the effects of innovation can be seen only after a considerable time or be measured only years later. When it comes to such long-term projects, you can't assess whether it is working after just six months. 'You invest in what can strengthen your competitive position. Our legitimacy stems from the fact that a project proves itself. And that takes 15 to 20 years – only then do you see the returns. We firmly believe that we are going to do well.'

- **TenCate participates in the Materials & High-Tech Systems cluster within the Innovation Route Twente**
- **The strength of TenCate in innovation projects lies in an open mind and a connecting role in regard to other companies**
- **Falling subsidies force parties to concentrate on the content of projects**

[www.twentse-innovatieroute.nl](http://www.twentse-innovatieroute.nl)

# Open innovation

**TenCate is often initiative taker and partner in open innovation and co-creation, and plays an important role internally, regionally and nationally in innovation and development projects. An open innovation centre for advanced materials on its own location in Nijverdal is close to realization. The TenCate technology roadmaps are the basis for every development within TenCate.**



Technological innovation is the cornerstone of the TenCate business model. Besides its own internal (closed) innovation, TenCate collaborates with partners in the value chain on chain innovation and with third parties in open innovation projects. Here TenCate is generally the initiative taker. TAPAS and TPRC are examples of chain innovation, while an example of open innovation is the Open Innovation Centre Advanced Materials (OICAM).

## **Spearhead**

An important role is ascribed to advanced (technical) materials as the next step in technological innovation and a spearhead for regional development. OICAM is an 'open workplace' where the business community and academia can come together to develop new functionalities. 'It's buzzing with ideas.' The open innovation centre in Nijverdal will be housed in the TenCate business facility. Renovation work began in the middle of January 2011 and the opening is planned for the end of April. The government has signed up for half (€750,000) the necessary funds. TenCate, as well as the Applied Polymer Innovations (API) Institute, Saxion University and others, are making machinery available. All participating parties are contributing to the project on a pro rata basis, in this way demonstrating their commitment.





Recyclable synthetic turf based on yarns from TenCate Grass, a woven system from TenCate Protective Fabrics and a coating from TenCate Geosynthetics

## Development projects

The department of corporate technology within OICAM has now completed the KIEM (sustainable innovation support programme) project Biopolymers and tailored blanks. Tailored blanks are custom-made compounds of materials of different kinds and thicknesses in one component.

The second big KIEM project is 3D weaving (distance weaving), with a maximum distance of 10 cm between the upper and lower fabric. The first 600 m<sup>2</sup> will probably be installed in the Twente region. Using this technology, three-dimensional objects can be produced, retaining the typical characteristics of flat woven materials but then in all three dimensions. The advantages of 3D weaving apply to weight, strength, shape stability, quality, homogeneity, production costs and production waste. The technology is suitable for various market groups and applications, and is therefore selected for sub-projects: synthetic turf, geotextiles (TenCate Geotube® with three-

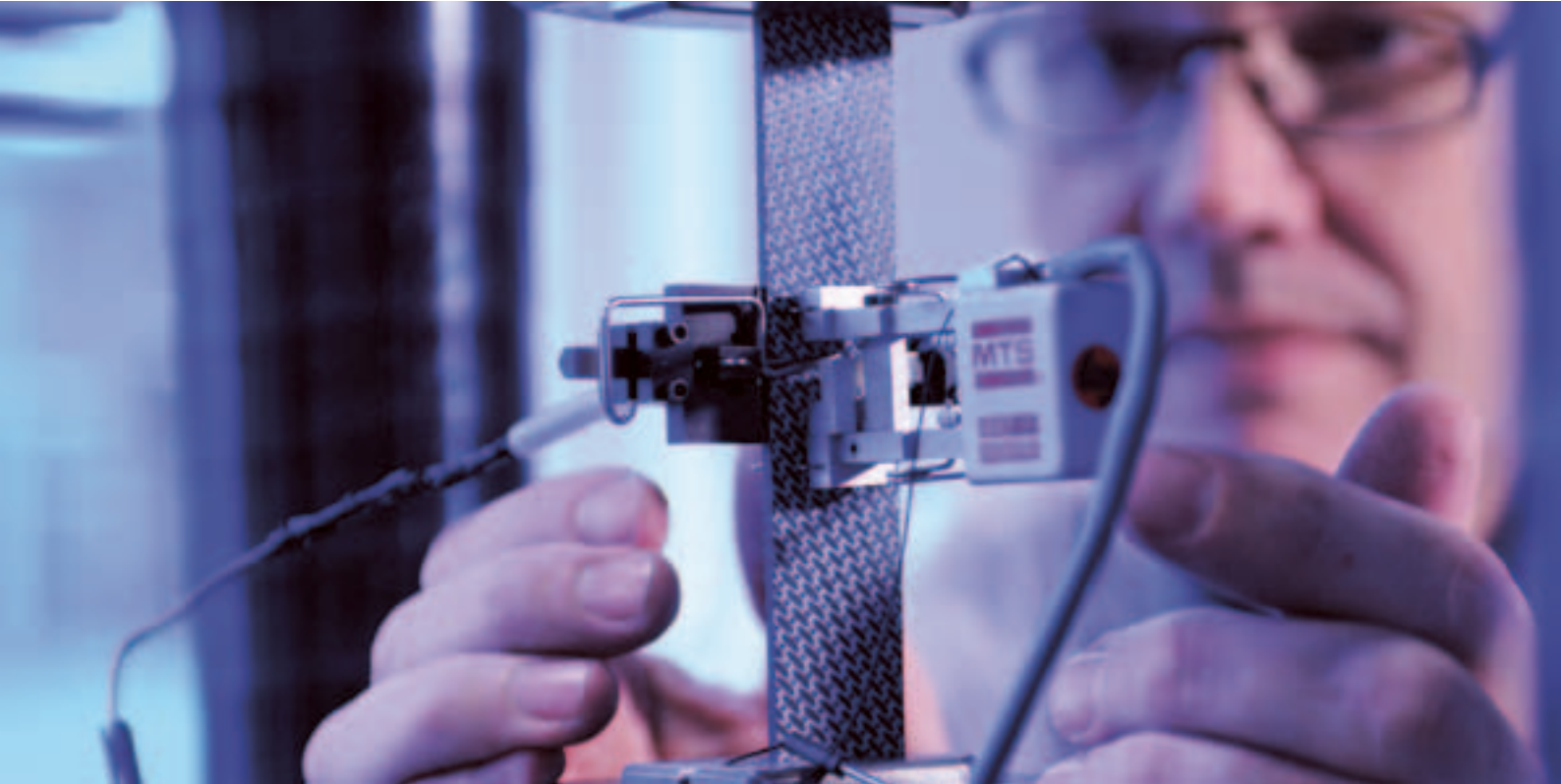
dimensional walls) and armour composites (comfortable helmet interiors).

### **Biologically degradable**

Recently secured, the next large KIEM project is called BETON: the Biobased Economy Technology Oost-Nederland. 'Biobased' is the generic name for products from natural raw materials, which are biologically degradable and harmless to people and the environment. TenCate's department of corporate technology works together with the development department of TenCate Geosynthetics on biodegradable TenCate Geotube® for water filtration, which is swallowed up in the

*Continued on page 16*

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environment after its operating period. As regards biobased yarns, TenCate is investigating the applicability of a degradable biopolymer that is due for development. The new yarn will also be rendered suitable for functional applications in other TenCate sustainable products.

### **Polymers**

Like Norit (membranes for water purification), AKG (recycling & compounding of synthetics) and others, TenCate is a partner in a development project concerning water purification. In this respect the expertise of the Applied Polymer Innovations (API) Institute is employed. This research institute specializes in applied research into polymers. This KIEM project is in the application stage. Based on European legislation, a maximum level is to be established in 2012 for the medicine content of drinking water. One possibility is to combine membranes

with the activation of TenCate fabrics such as TenCate Geotube® for water filtration. 'Even before we begin, we know that a market exists for this,' says Martin Olde Weghuis (manager, corporate technology). Because medicine leftovers end up in various places in surface water (pig breeding, etc.), the water will have to be decentrally pre-purified before discharge. And this can be done with TenCate Geotube® and a Norit water filtration unit.

### **Forms and processing**

Within the Advanced Manufacturing Research Centre (AMRC) of the University of Sheffield (England), Boeing is working with TenCate and other partners on the development of innovative technological solutions for forming and processing advanced materials such as thermoplastic composites. The goal is to devise economic and ecological cutting-edge solutions

to production problems, for example on the basis of the TenCate unidirectional (UD) tape technology. Robotically steered application of this UD tape can be important to the aerospace industry, for example.

### **Synthetic turf**

A good example of internal cooperation and innovation is a fully recyclable synthetic turf based on grass yarns from TenCate Grass, a woven system from TenCate Protective Fabrics and a coating from TenCate Geosynthetics, all three based on polyethylene. 'That's how TenCate prefers it: worldwide cooperation between the different market groups. Together we can do so much more. Here the three basic TenCate technologies – the fibre, weaving and finishing technologies – come together.' At the foundation of every development within TenCate are the TenCate technology roadmaps.



# Crowdsourcing

The sharing and securing of knowledge need not be restricted to one's own company or to collaborative partnerships. New media are eminently suitable for open source collection and sharing of knowledge and for product development. One recent development is crowdsourcing. Suppliers, customers and end-users can in this way become involved in research and the development of new products and systems. The crowd collaborates 'free of charge' in the solving of problems and the sharing of solutions – online and in principle 24 hours a day, worldwide. For companies, crowdsourcing offers the possibility of submitting problems to a large group of experts.

Crowdsourcing is not carried out solely via the internet, although this is mainly the case. The innovation cluster OICAM intends to build a platform for crowdsourcing relating to advanced materials, with Twente as its base.

These roadmaps to the future make visible the relation between present and future technologies, products, functionalities and markets. With these technological overviews as a benchmark, TenCate has drawn up a technological vision of the future for each market group. The specifications of the end-users, the characteristics of the materials and market requirements remain the point of departure.

Another research undertaking relates to a skin-sensitive indicator for materials. It concerns the development of equipment to measure the medical impact of materials that come into contact with the skin. Examples include giving sports systems lower sliding resistance (TenCate), medical equipment (Radboud University) and shaving devices (Philips).

- **TenCate cooperates both internally (closed innovation) and with partners inside and outside the value chain (open innovation) on development and innovation projects**
- **TenCate technology roadmaps make visible the relation between present and future technologies, products, functionalities and markets**
- **Internal innovation project combines the three basic TenCate technologies**

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# TenCate in Twente, the



**If Europe wishes to withstand the economic growth and innovative power of the United States and Southeast Asia, then it must continue to innovate. Through technological and social innovation you can strengthen your competitive power and create added value on the basis of high-grade technological developments. It doesn't have to depend on the available funds but rather on the boldness and willingness to make choices and work together. Frans van Vught contemplates the developments and the role of TenCate at the Twente, national and European levels.**

Until six years ago Frans van Vught was Rector Magnificus and chairman of the executive board of the University of Twente (UT), and during this period he was already a member of the national Innovation Platform. On leaving the UT, he became adviser to José Manuel Barroso, chairman of the European Commission. In Twente he is a member of TenCate's Supervisory Board, as well as chairman of the supervisory board of Medisch Spectrum Twente (the hospital of Enschede). As member

of the Innovation Platform, he co-devised the plans of the Balkenende Cabinet for strengthening the competitive power of our country. As adviser to Barroso, he helped to shape European innovation policy.

### Three levels

So Frans van Vught stands with one foot in the region and the Netherlands and the other in Europe. As few others are able, he can make connections between the three levels at which

research and innovation are carried out. Innovation helps to strengthen competitive power and create added value. It therefore comes as no surprise that Frans van Vught is unhappy that the Netherlands has scarcely invested in innovation. To put it frankly, he feels that nationally and regionally there is a lack of nerve when it comes to choosing, with a consequent failure to pool resources. In this Brussels is much more ambitious: €54 billion is available for research and €3.5 billion for direct support for small and medium-sized companies; and the Structural Funds amount to over €300 billion, of which €86 billion for innovation.

### Does Europe look at innovation very differently from the Netherlands?

'In substance the European Union is strongly driven by the question: how can we ensure new economic growth? How can we respond to the rapidly growing economy in the United States and above all in Southeast Asia? Actually the only answer is innovation. We can't compete in terms of labour costs – that's why TenCate has located part of its production in Southeast Asia. In the Netherlands we have to rely on added value, smarter products and high technological renewal.'

### Is innovation in our Dutch DNA?

'The Dutch are born traders. Much of our added economic value comes from trade, witness Schiphol and Rotterdam. Over the last decades emphasis has increasingly been laid on innovation. Just think of Philips, ASML and certainly TenCate. There has been a shift from producing volumes to producing new products on a global scale. A different mentality prevails in the United States. People are willing to take risks, are not frightened of going bankrupt and are prepared to work hard. There are fewer



# Netherlands and Europe

social safety nets there than here. As a result there is greater innovation capacity. In the European Union we have nothing more than a system of agreements. European decisions must be reached through forming a consensus between the EU member states. This makes us relatively slow, as demonstrated in the case of the euro problem. And in the area of innovation too, we would be better served by greater cooperation and quicker decision-making.'

## **You mention the boldness of the Americans. Is this lacking in the Netherlands?**

'In the first Innovation Platform – we've just finished the second – under the leadership of Prime Minister Balkenende an inventory was made of key areas in the Dutch economy where we should focus our efforts. The frustration of the members of the Innovation Platform stemmed from the fact that the Balkenende Cabinets did not adhere to this. I hope that Minister Verhagen (Economic Affairs, Agriculture & Innovation) is going to carry out the knowledge investment agenda. Late in the day, it is true, but it is good that a linkage is taking place at European level. The stronger the links between the levels, the greater the chance that economic growth will be generated.'

## **What's involved in making the links?**

'Establishing links between the levels means, besides communication on policy processes, jointly seizing opportunities. The European government leaders have decided that large chunks of regional stimulation must be dedicated to knowledge and innovation. The provinces can help to develop a more robust innovation policy for the regions. It's important for managers to know what the links are like between the Netherlands and Europe as far as regional innovation processes are concerned.

Otherwise you could direct your efforts towards regional processes that are too small on the European scale to stimulate growth. From the European perspective we definitely have opportunities, but too little attention is paid to the possibilities of realizing them.'

## **What is TenCate's position in this development?**

'There's a great deal of innovation potential in TenCate. We have new activities under development, for example nanoscale inkjet technology. In principle, a package of new products is possible in which considerable innovative power can find expression. TenCate has already developed into a major player in the field of advanced materials. This approach fits in extremely well with the future European innovation policy. So on the European scale we can neatly link up with the priority innovation areas. The TPRC consortium of TenCate, Boeing, Fokker and the University of Twente is one of the technology platforms at European level. It is good that TenCate is playing an important role in this.'

## **Would it not be better for TenCate to focus on Europe?**

'TenCate mustn't break away from Twente, but it is certainly a global company. We can make good use of this on the regional and national scales for high-tech systems and particularly materials. On the European scale TenCate chairs a European Technology Platform. So we are present at the European level and can operate further from this vantage point. From a European perspective TenCate is an interesting company. It is a good example of a company of Twente origin that plays a role on the national scale in the national innovation policy and is involved on the European scale in part of the

development and implementation of European innovation policy. TenCate forms a dovetail between these three levels. By reinforcing this further, the company can strengthen Twente's innovation capacity.'

## **In your view how is it going with the links within TenCate?**

'Within TenCate the Executive Board itself has a strong feeling for innovation. Certainly the Board endeavours to seek synergy and use it. The more, the better. The strategic vision meshes well with innovative thinking. The Supervisory Board and the Executive Board also talk about future products and services. These are now in the pipeline, with innovation and knowledge as the basis. But a strong emphasis on innovation is in complete accordance with our strategy.'

## **Innovation projects require a long lead time. Where will Europe be in fifteen years?**

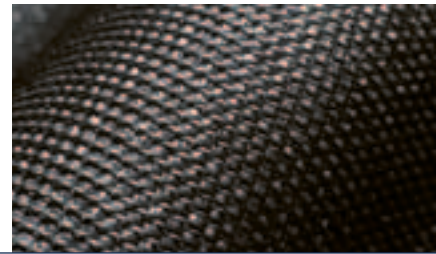
'In fifteen years Europe will be more of a service economy than it is now, with a specialized and high-grade manufacturing industry to boot. And I expect TenCate to remain an important and innovative player in the latter category.'

- **For economic growth the Netherlands must rely on added value, smarter products and high technological renewal**
- **In the area of innovation too, greater cooperation and quicker decision-making would prove helpful to the European Union**
- **TenCate has developed into a major player in advanced materials, an approach that fits in with the future European innovation policy**

# Excellent work in South Korea

In October 2010 TenCate Geosynthetics USA won an Award of Excellence in the 2010 International Achievement Award (IAA) for the Incheon Bridge project in South Korea, in which TenCate Geotube® technology was used. This technology has many uses, including the protection of coastlines, the creation of islands in the sea and land reclamation. It is a sustainable and cost-effective method. The award highlights the key role that TenCate Geosynthetics plays in offering system solutions for critical environmental and infrastructure projects worldwide.





**MARKET** – Environment and infrastructure (bank protection, dewatering, etc.). **PRODUCT** – TenCate Geotube®. **TECHNOLOGY** – Extrusion, weaving and coating technology. **PROCESS** – Storage and dewatering of natural materials and contaminated sludge.

The Incheon Bridge (October 2009) near the South Korean city of Incheon is a cable-stayed bridge. An artificial island had to be created to provide a construction platform for building this cable bridge. First filter mats were laid at low tide, and then the TenCate Geotube® systems were installed. The tubes were filled with sand, which was delivered from offsite in barges.

It was a difficult mission, because work could only be carried out at low tide and engineers had to contend with tidal fluctuations of up to nine metres. This was one of the reasons for opting for TenCate Geotube® containers. Under the circumstances it was the most cost-effective and time-efficient method.

#### Construction of work platform

First two containers, each 4 metres in diameter and lying side by side, were placed on either side of the work platform and the space in between filled up with sand. On top of this came a second filter mat, after which containers with a five-metre diameter were installed and filled. The third layer consisted of TenCate Geotube® units, which had a diameter of three metres. The containers, made of a high-strength woven textile, varied in length from 15 to 60 metres. Once filled, the tubes had

a height of 1.80 to 2.40 metres. All this was stacked in tiers to reach a final height of 7 metres. The installation of TenCate Geotube® systems began at the end of April 2006 and was completed in December of the same year. In total 18,000 metres of TenCate Geotube® were supplied.

#### Involvement

The greatest challenge lay in delivering the TenCate Geotube® systems in these huge quantities at precisely the right time. On behalf of TenCate Geosynthetics, Tack Weng Yee, Edwin Zengerink and Jong Choi, TenCate Geosynthetics' agent in South Korea were involved in the project. Tack Weng Yee's role was to get the contractor interested in using TenCate Geotube® technology and to provide technical support during the design and construction. Edwin Zengerink advised and coordinated production in Almelo. Annette Pahlplatz ensured the correct delivery of materials in line with the customer's schedule. As a result, deliveries lived up to the customer's expectations at the construction site. The island on which the bridge rests has now been wholly incorporated into a land reclamation area.

#### Strengthened

Scooping this project has been a contributory factor in further strengthening TenCate Geosynthetics' leading market position in Asia. 'The success of this project has helped us enormously to market TenCate Geotube® technology in Malaysia and in Asia', Tack Weng Yee tells us. 'In Asia, as TenCate Geosynthetics, we are concentrating on offering the customer system solutions instead of just materials.' This is entirely in line with the strategy of TenCate Geosynthetics: from the product information stage to the development and delivery of complete solutions.

- **TenCate Geosynthetics supplied a constructive contribution to completion of the longest bridge in South Korea**
- **TenCate Geotube® technology is a cost-effective, environment-friendly, fast and reliable solution**
- **Success strengthens position of TenCate in infrastructure market in Asia**

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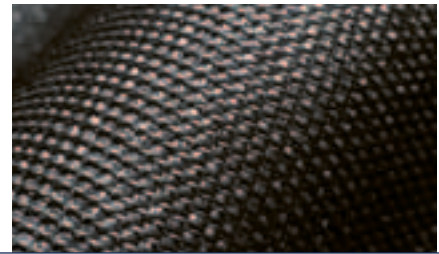


The Incheon Bridge (October 2009) is 12.34 kilometres long and the fifth longest cable-stayed bridge in the world. This is the second link between the island of Yeongjong and Songdo City on the mainland, in the industrial area to the southwest of Incheon. Moreover, it is the longest bridge in South Korea. The bridge has a high navigational clearance of 74 metres, to allow ocean-going vessels of up to 100,000 tons to enter the harbour of Incheon. This is necessary for the power station there to be supplied with coal by large ships. On the island is Incheon International Airport (2001), the largest airport in South Korea and one of the largest in Asia.

# A clean sweep in Brazil

In partnership with Allonda Comercial de Geossintéticos Ambientais Ltda in Brazil, TenCate Geosynthetics is involved in two large dewatering projects. These relate to the cleaning up of the Canal do Fundão near Rio de Janeiro and the removal and dewatering of contaminated sediment at Sepetiba Bay, just west of the capital.





**MARKET** – Environment and infrastructure (bank protection, dewatering, etc.). **PRODUCT** – TenCate Geotube®. **TECHNOLOGY** – Extrusion, weaving and coating technology. **PROCESS** – Storage and dewatering of natural materials and contaminated sludge.

Allonda Comercial de Geossintéticos Ambientais Ltda is the distributor and marketing partner of TenCate Geosynthetics in Brazil for TenCate Geotube® and TenCate Mirafi®. Dewatering with TenCate Geotube® technology is an effective, strong and sustainable system solution and in cost terms an attractive alternative to traditional hydraulic engineering structures. This technology – in combination with biopolymers – is used worldwide in the restoration of coastlines, the cleaning of rivers and lakes and the dewatering of polluted process water.

#### Not familiar

When the company began its marketing activities and the distribution of the TenCate Geotube® dewatering system, the local market was not yet familiar with this technology. No geotextiles or tubular materials had ever been used for the storage and filtration of wastewater. Allonda recognized the importance of demonstrating the success of projects with TenCate Geotube®, to gain acceptance of this technology in the marketplace. A separate service division was therefore set up to create and manage a dewatering cell based on TenCate Mirafi® geotextiles. These serve to reinforce the sub-base that would accommodate layers of stacked TenCate Geotube® containers. A suitable project partner was found in Odebrecht, a large engineering and construction company.

#### Around Rio

The second largest project in the southern hemisphere in which TenCate Geotube® containers have been used relates to the Canal do Fundão near Rio de Janeiro (Brazil).

Over time this 6.5 km-long canal became contaminated, due to the dumping of petrochemical residues. By mid-2011 the Canal do Fundão will have been cleaned up and the natural circulation of clean water restored. Meanwhile, at Sepetiba Bay, off the coast just to the west of Rio de Janeiro, a similar project is being completed. This involves the removal and dewatering of more than 550,000 m<sup>3</sup> of sediment contaminated with PCBs (toxic organo-chlorine compounds) and heavy metals. This contaminated waste will be dewatered and stored in TenCate Geotube® containers. The clean-up is necessary because a naval base for a new class of nuclear submarines is to be built in this bay. In mid-March this extensive project will be brought to a successful conclusion – effectively, cost-efficiently and with a minimum of impact on

the environment. Allonda will then have completed two projects that look as though they will pave the way to similar environmental remediation projects in the future.

- **Following its successful introduction, TenCate Geotube® will be used in two infrastructure projects in Brazil**
- **Proven technology is a cost-effective, efficient and environment-friendly solution**

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Contaminated sludge is stored and filtered in TenCate Geotube® containers





# 2010 Annual results by the figures

On Wednesday 2 March TenCate presented its annual results, which drew a favourable response from the market. The increase in net profit of well over 90%, to €46 million, is a good result. On balance, expectations are positive, with a continuing rise in revenues and result being announced.



L. de Vries, President and CEO

# Equal results received well financial market

'Looking back on the year 2010, there are two developments that are worthy of note, and these are expected also to make an essential contribution in 2011.

In the first place, it is clear that sales in the TenCate Defender™ M product portfolio have fully recovered. A catch-up effect took place in the second half of 2010, because the US Department of Defense needed time to adapt the camouflage print to conditions in Afghanistan. The huge quantities that were supplied in the fourth quarter of 2010 made this a challenging operation, in logistical terms, in which many American companies were involved. It entailed some 10,000 jobs in the United States, mainly outside TenCate. This development is expected to continue into the third quarter of 2011. Another positive aspect is the fact that safety and protection are high on the agenda in other countries too and that interest in these products is increasing outside the US. 'People protecting people' is a key theme within TenCate.

Apart from this development within the Advanced Textiles & Composites sector, one of the points of action in the past year was the achievement of a clear profit recovery within the TenCate Grass group. The year 2009 saw a sharp focus on the cash position, which put downward

pressure on revenues and results. In 2010 the measures that had been taken earlier resulted in a substantial recovery in profits. This trend should continue, with the downstream activities linked in to this. TenCate currently has strong end-user brands, such as GreenFields, TigerTurf and Edel Grass, which offer synthetic turf systems (Powered by TenCate) to the market. TenCate's downstream strategy will become well defined in the course of 2011.

The EBITA margin rose considerably, but still remains below the desired level. There were additional costs and pressure on margins in certain areas, particularly within the Geosynthetics & Grass sector. The EBITA margin of 6.7% in this sector needs to be improved. The actions necessary to achieve this have already been put in place. The key points of action as regards geosynthetics are focusing on margin recovery in Europe and further growth in Asia and South America.

The EBITA margin of the Advanced Textiles & Composites sector is virtually at the minimum objective of 10%. A further increase within this sector will be buoyed by the growing demand for aerospace composites and further sales growth, particularly in the industrial market for protective fabrics (TenCate Tecasafe™ Plus). These two markets are currently regarded as major

opportunities for 2011. The Active Blast Defence System is an opportunity for the armour composites activities.

There are, however, not only opportunities but also threats. The principal factor is the situation in the Middle East, which is already having the effect of forcing up oil prices and which – over time – may have an impact on the related raw materials prices. TenCate has unique products, for which any price increases will be passed on. This will as a rule be done with a certain delay, in view of for example certain commercial interests and current contracts.

On balance, expectations are positive, with a continuing rise in revenues and result being announced.'

# The best protection

**Since 2005 Defence has been a 'structural and fully fledged partner in national safety'.**

**The Royal Dutch Association of Reserve Officers held a symposium on this subject on 25 November 2010. TenCate was chief sponsor. Among those present was former commander of the Dutch armed forces Dick Berlijn, member of the International Advisory Board of TenCate. Looking back, he recalls a good congress.**

TenCate develops and produces materials for protecting citizens and the military, as well as army and civilian vehicles. During the symposium TenCate as main sponsor delivered a presentation on solutions for military equipment and armour. In as far as there ever has been a division between the tasks and responsibilities of the army and civil aid and protection organizations, such a distinction has existed since 2005 at most. Up until that time somewhat tardy and inadequate use was made of army capacity in crisis situations, for example for filling sandbags in cases of high water levels. In 2005 a covenant was signed regarding military capacity for civil support. Since that year, Defence has been increasingly asked to contribute to combating the consequences of disasters and to controlling crisis situations. In addition grateful use can be made of specialist expertise and experience in areas such as commander control, strategic planning and communication. Three regional military commando units and 25% of the capacity can be deployed for emergency aid. It was recently decided that the army would take the lead in calamity situations. By the middle of 2012 two companies of the Royal Netherlands Army will be ready to go into action

when calamities involving harmful substances occur – as was the case after the fire at the chemical plant in Moerdijk earlier this year.

## Threat levels

National safety is well served by civil-military cooperation. The threat levels are rising, and the problems and threats themselves are becoming increasingly complex and far-reaching. To further intensify the cooperation between army and civilian organizations, joint exercises must be regularly carried out. In addition it is important that investment in R&D and innovation be continued. Smart technology is necessary to be able operate swiftly and decisively in the face of diminishing financial resources, increasing conflicts and an ageing population. TenCate constantly works on developing new, and improving existing, materials for the protection of people (TenCate Protective Fabrics), material (TenCate Advanced Armour) and the environment (TenCate Geosynthetics). In the last case, it is a matter of restoring the infrastructure after hostilities. The armour materials, which offer weight reduction and better functional characteristics, replace traditional materials such as steel and

aluminium. The specifications for these materials are mostly drawn up by government authorities or agencies.

## Requisitioners

Among those present was former commander of the armed forces Dick Berlijn. He is a member of the International Advisory Board of TenCate, a strategic advisory body supporting the Executive Board. In the opinion of the former commander, 'It was a very good congress. The middle echelon of majors and colonels was particularly well represented. It is important to be able to co-write with the requisitioners.' According to Dick Berlijn, Defence is now aware of what TenCate can deliver in this area, although there are still opportunities to be seized. 'For a commander of the armed forces, brands such as General Dynamics, Boeing and Krauss Maffei are to the fore. It is only a few years ago that I heard that in the United States about 75% of the satellites had TenCate materials on board and TenCate supplied important fabrics such as TenCate Defender™ M for the equipment of the American army and marine corps. Make people more aware that you can offer much more. Promote more aggressively the products for the defence and protection of people and vehicles. The name TenCate must be more closely linked with defence capabilities.'

## End-users

This demands a more focused approach from end-users, without neglecting the decision-makers in the process, particularly as regards Defence. End-users have an important voice in the final selection process. 'This is the role of the government, but it will listen attentively to what the end-users consider important –



# for citizen and soldier

certainly if they're extremely enthusiastic. Ultimately it's a matter of giving people the resources that in the first instance do what we expect of them. The government will also look at the costs.'

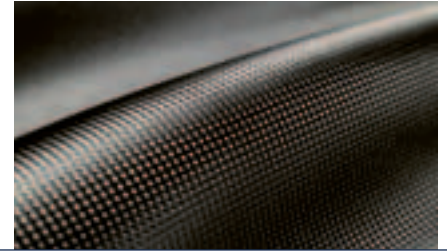
The demands that Defence and organisations make on materials and equipment will increasingly converge. 'I see a shared vision. If we ask young people to do dangerous things, we as a society have a duty to ensure that they can carry them out optimally and under the safest conditions – that they are well trained, understand the safety instructions, and have the best gear for protection purposes. Civilian or Defence, it's the same. It's a highly competitive environment. TenCate will have to see where they can make the difference and how they can make that clear.'

- **Since 2005 Defence in the Netherlands has increasingly joined together with civil agencies in combating the consequences of disasters and controlling crisis situations**
- **TenCate constantly works on developing materials for protecting people, material and the environment**
- **The brand name TenCate must be more closely coupled with products for the defence and protection of people and vehicles**

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Dick Berlijn



# Superbus on the way

**This is innovative mobility: getting on Superbus at the agreed point and time and then being conveyed quickly, comfortably and safely to the destination. The test runs and presentations at home and abroad are over and done with, and now it's just a matter of time. TenCate is involved in the project as material supplier. TenCate Cetex® (continuous fibre-strengthened thermoplastic composites) is used in the body and the eight doors of this sleekly designed vehicle.**



Eight doors, incorporating TenCate Cetex®, provide access to the comfortable interior of the Superbus

**MARKET** – aerospace, industrial applications.  
**PRODUCT** – TenCate Cetex®. **TECHNOLOGY** – weaving and impregnating technology.  
**PROCESS** – materials installed as pre-shaped panels in the body parts.

Over the last few years a team from Delft University of Technology (TU) has been working on the concept with great dedication. The core principles relating to Superbus are sustainability, flexibility, energy efficiency, comfort, affordability, safety and reliability. So TenCate is making an essential contribution to a world in which safety, protection and sustainability are self-evident.

#### Public transport connection

Work is in progress with the Government Department for Transport on a registration number. When Superbus will take to the road is not yet known – after all the TU is not a factory. 'We show what can be achieved in the technological field,' explains Joris Melkert (team member and aviation expert). 'Afterwards we'll move on to the next discovery, so to speak.' There might be a role here for transport operator Connexion, one of the main sponsors. For example, there is nearly €600 million available for a public transport connection in the North. This money comes from the pot for the Zuiderzee line. Superbus could then be deployed on the route Heerenveen-Drachten-Groningen and back. 'We're now busily drafting an interesting proposal in this respect,' says Joris Melkert.

Opportunities are also being explored beyond the national borders. Here the distances are usually greater and the willingness to match the innovative word to the deed often exceeds that in The Hague. That's why Superbus is likely to be seen in April at a large public transport exhibition in Dubai.

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## TENCATE GRASS USA EXPANDS PRODUCTION TENCATE TAPESLIDE™ XP



In the production department of TenCate Grass in Dayton, Tennessee (USA)

# The hardwearing turf fibre

**TenCate Grass in Dayton (Tennessee, USA) has expanded the TenCate Tapeslide™ XP production capacity with a new production line. The TenCate Tapeslide™ XP fibres are recommended for intensively played sports fields. This expansion will enable TenCate Grass to meet the highly increased worldwide demand for this high-grade wear-resistant synthetic turf fibre.**

Many sports fields are used for training as well as matches, and more than 3,000 playing hours a year is no exception. So the fibres are under extreme pressure and as a rule wear out quickly. Consequently synthetic turf with the most durable fibre must be installed in such intensively used sports fields. Laboratory research and practical experiences indicate that TenCate Tapeslide™ XP fibres are remarkably resistant to wear. Architects and specification writers are increasingly opting for TenCate

Tapeslide™ XP fibres, in the knowledge that this is the most durable turf fibre on the market.

### **Growing demand**

TenCate Tapeslide™ XP is manufactured in accordance with a process developed by TenCate. This produces fibres that are considerably more hardwearing than those delivered by other processes. The synthetic turf fibre is supplied to prominent manufacturers of synthetic turf carpet, including AstroTurf, Edel

Grass, FieldTurf Tarkett, GreenFields, Limonta and TigerTurf. The global synthetic turf market is increasingly demanding sustainable solutions. TenCate Grass has already been offering these for years and furthermore is the only supplier in the world to offer an optional guarantee of five years on wear resistance, irrespective of the number of hours of use. This underlines the pursuit of product and system sustainability. Cooperation within the value chain generates greater control of the whole process, with maximum quality assurance as the result. In this way TenCate Grass gives a general boost to the improvement of playing characteristics and the sustainability of synthetic turf sports fields.

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# 5-a-side pitch in Australia

**TigerTurf Australia is to construct a full-size synthetic turf football pitch and nine 5-a-side pitches in the Eastern Recreation Precinct, a new sports and recreation complex for Knox City Council (Melbourne). The 5-a-side pitches will be based on TenCate XP Blade™ synthetic turf yarn, which was specially developed by TenCate for durable, high usage pitches. The playing of 5-a-side on this top quality pitch is expected 'to add a new dimension to football in Australia'.**

The Eastern Recreation Precinct is a new sports and recreation complex for Knox City Council in Wantirna South, to the east of the capital Melbourne. In addition to a FIFA 1 Star football pitch and nine 5-a-side pitches for recreational use, the complex also houses an open grassed area for informal recreation, and an area for the Victorian Association of Radio Model Soaring, an outdoor plaza and forecourt and large car parks. 5-a-side is a variant of association football (soccer). Each team has five players (four outfield players and a goalkeeper). The playing pitch measures 20 x 40 m, the goals are smaller and the playing time shorter. One of the contributory factors to TigerTurf Australia winning the tender in preference to other suppliers was the durability of TenCate XP Blade™ high-performance synthetic turf yarns.

## First of its kind

This project is the first of its kind in Australia. The main pitch will be surfaced with synthetic turf from TigerTurf - Soccer Real MS50 – laid over a 15 mm shock pad and will be field tested to FIFA 1 Star standards. TigerTurf Soccer Real MS50 has a pile height of 50 mm and, in combination with a special monofilament surface and infill, it will produce a pitch that

performs like freshly-watered, high quality turf, without the need for water. Players' skills and enjoyment are enhanced as the playing surface is even and safe.

## High usage

TenCate XP Blade™ is a high-performance synthetic turf yarn that was specially developed by TenCate for high usage pitches with unrivalled durability (3,000 hours a year). TenCate Grass in Dayton (Tennessee, USA) produced the synthetic turf yarns and the tufting was carried out by TigerTurf. The pile height is 50 mm. The polyethylene fibrillated surface will be laid over a preformed shock pad. This synthetic turf surface will outlast every other type of synthetic turf yarn in the market. Whereas all other yarns of this type will wear out by splitting, TenCate XP Blade™ does not split, making it also the most resilient playing surface, with the added benefit of virtually no infill splash. These highly durable wear characteristics enable a five-year durability warranty to be given.

## 'A great place'

The pitches will be completed in mid-2011. The sports and recreation facility will be managed by Football Federation Victoria (FFV).

In the opinion of Mark Rendell, FFV CEO, the new football centre will be a unique first in Australia. 'With the excellent facilities being built here, the Knox Regional Centre will be a great place for everyone to enjoy playing and watching football – twelve months of the year.' The combination of a recreational form of the game with the traditional form of football will, he believes, help to provide a new source of income and create new opportunities for participation. 'The combination of facilities is crucial for the Centre. 5-a-side is the most popular form of sport in the United Kingdom and will add a new dimension to football in Australia.'

- **TenCate XP Blade™ selected for the excellent durability of its high-performance synthetic turf yarns**
- **This sports and recreational project is the first of its kind in Australia**
- **A five-year durability warranty is given, thanks to its high wear resistance**

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**MARKET** – sport and recreation. **PRODUCT** – TenCate XP Blade™ turf fibre and backing  
**TECHNOLOGY** – extrusion technology.  
**PROCESS** – synthetic turf fibres are tufted into the backing and installed as part of the synthetic turf system.

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## TENCATE TAPESLIDE™ SCORES ON WEAR RESISTANCE AND DURABILITY



**MARKET** – sports and recreation. **PRODUCT** – TenCate Tapeslide™ XP turf fibre and backing. **TECHNOLOGY** – extrusion technology. **PROCESS** – synthetic turf fibres are tufted into the backing and installed as part of the synthetic turf system.

TenCate Tapeslide™ is used for tufting into TigerTurf's Tournament 1000, which forms the basis for a new volleyball court and school quadrangle at Hedland Senior High School in South Hedland (Western Australia). The area, with its attractive and safe playing surface, is now usable day in, day out.

# TigerTurf goes the distance



When Hedland Senior High School (South Hedland, Western Australia) decided to resurface its existing bitumen basketball court and natural grass school quadrangle, the distance of 1700 kilometres to TigerTurf's office in Perth presented no problem. Tournament 1000 with TenCate Tapeslide™ PP 8800 thus goes the distance both literally and figuratively.

### Ideal

The school's present bitumen basketball court was upgraded with an acrylic surface –

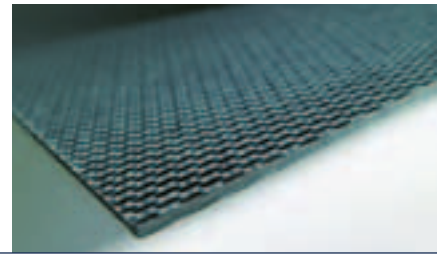
TigerPave. This is a durable, hard-court system providing a reliably level surface, which has true ball bounce and skid resistance and requires little maintenance. The quadrangle, an existing natural grass area, was transformed into a volleyball court in blue with a green surround, using TigerTurf's Tournament 1000. The basis for Tournament 1000 is TenCate Tapeslide™ PP 8800, which is manufactured in the Netherlands and Dubai. Its pile height of 19 mm for the turf yarns and stitch rate of 285 ensure that the pitch is ideal for intensive use.

The area provides a safe, level and attractive low-maintenance surface that can now be played on day in, day out.

TigerTurf will complete many more similar projects in schools during the course of 2011. Many bitumen pitches or natural grass areas will be converted into courts using TigerTurf, with various line markings for sports and play.

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





**MARKET** – aviation industry **PRODUCT** – TenCate Cetex® **TECHNOLOGY** – unidirectional tape and impregnating technology **PROCESS** – Materials are applied to the structure as pre-formed panels

# Award for innovative seat frame

TenCate Advanced Composites USA in Morgan Hill (California, USA) is the joint winner of a 2011 JEC Composite Innovation Award.

This award relates to the composite aircraft design of a modular composite seat frame incorporating TenCate thermoplastic prepregs. In 2010 TenCate Advanced Composites and its project partners also received a JEC Innovation Award relating to the aircraft elevator and rudder of the Gulfstream G650.

The 2011 JEC Innovation Award in the thermoplastic composite category will be awarded to Cutting Dynamics Inc, together with TenCate Advanced Composites, A&P Technology and Ticona Engineering Polymers, which teamed together to develop a thermoplastic, modular composite seat frame used in passenger seat assemblies on lighter, more fuel-efficient aircraft.

## Frames

The 2011 JEC Innovation award-winning modular composite seat frame from Cutting Dynamics Inc. consists of a match moulded seat back and seat pan that support the seat cushion. A&P Technology designed and developed a braided pre-form from TenCate Cetex® UD tape, which exactly meets the geometry and mechanical requirements of the seat frame. This was then shaped by Cutting Dynamics into a complex tube, using a production process that is capable of achieving high volumes, unique in the aerospace industry. This collaboration allowed Cutting Dynamics

to reduce process costs, increase process volume and improve both aesthetics and overall quality.

## In-house expertise

‘This is truly a team achievement’, noted Jim Mondo (Vice President of Thermoplastic Technology at TenCate Advanced Composites USA). ‘It was made possible by the innovations of each of the recipients, who contributed in their own areas of expertise.’

In April 2010 TenCate Advanced Composites Europe, together with Fokker Aerostructures (NL) and other parties, was presented with the 2010 JEC Innovation Award for its contribution to a primary structure of the Gulfstream G650. TenCate Cetex® was used in the new tail section of this business aircraft.

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# New defence markets

**Through the acquisition in February 2010 of AML UK, the market group TenCate Advanced Armour has gained a strong foothold in the British market for lightweight composite armour solutions. Based on the strong position they have now acquired in the British defence market, the opportunities presented in the armour market worldwide can be fully harnessed.**

With production sites in Europe and North America, TenCate Advanced Armour has been an international force for several years now. It has supplied antiballistic solutions to important defence organizations in the United Kingdom, the largest armour market in the world after the United States. The country is on the eve of huge modernization and expansion programmes, and for this reason TenCate wishes to expand its position in this market, particularly in armour materials for vehicles, aircraft and vessels. In 2007 the time had come to take the next step in forming a pan-European armour organization, in the shape of a friendly acquisition in the U.K.

## **Support and advice**

In 2008 TenCate approached UK Trade & Investment (UKTI) in London, a government organization that helps companies when it comes to investing in and exporting to the United Kingdom. Various options – one was to start from scratch with a greenfield site – were discussed. After much consideration, it was decided that a friendly acquisition of a successful, established British company would allow TenCate to get to market quicker. That respected British company with an established name in the United Kingdom was AML UK. The company is involved in the design and production of materials for vehicles (as well as aircraft and naval vessels) for the British

Ministry of Defence and allied contracting parties. In addition the company offers a series of products for the safety market.

## **British quality**

'The United Kingdom has one of the largest defence export markets in the world,' says Matt Minshall (head of Defence Coordination at TenCate Advanced Armour). 'It produces some of the best technology, and British quality is still recognized globally as a badge of excellence.' TenCate was keen to enter this valuable and efficient market and from this base to pursue business opportunities around the world. For growth purposes, AML in its turn wanted to be part of a larger group – a



AML uses specific cutting techniques



world-class player – and preferably with people with whom it had had good experience. Contacts between TenCate and AML UK dated back ten years, several times in the form of successful cooperation on a project basis, including that regarding Warrior and BAE Systems.

#### **Reputation**

AML UK had fully functioning sites in Sandown (Isle of Wight) and in Swindon, and now the company has acquired a third site in Noida (India). 'TenCate knew that AML had a good reputation and was respected by the Ministry of Defence. Whilst the areas of expertise of the two companies were similar, there were some

additional sides to AML's business, such as working with fibre glass and using specific cutting techniques, which have widened TenCate's own capabilities and broadened the worldwide organization.'

Now AML UK is integrated in the TenCate armour organization. TenCate has combined the existing AML relationships with many of the key defence organizations in the United Kingdom, each with its own extensive network and existing contractual work. Such work includes armoured equipment programmes and the so-called 'urgent operational requirements' programmes. 'The combination with TenCate is a crucial step in the further development of the AML organization, enabling

it to participate in tenders for future army modernization programmes. Thanks to the broader production and technological base of the market group, the demands made by these programmes can now also be met.'

#### **Harnessing opportunities**

Since the acquisition, TenCate Advanced Armour has been involved in a number of collaborative projects in the United Kingdom. It has supplied ballistic solutions for UK warships for the protection of gunners. In November 2010 TenCate Advanced Armour UK attended the Land Warfare Conference in Brisbane (Australia), where local UKTI personnel assisted with meetings with potential customers.

Despite the reduction in some areas of defence spending in Europe, is still a useful market for TenCate, and there is active support with contacts in overseas export markets. Generally speaking customers are reacting positively to the acquisition and suppliers see it as a reinforcement of the position of TenCate in the global armour market.

- **TenCate has acquired a good position in the United Kingdom armour market**
- **Acquisition of AML UK means widening of the capabilities of TenCate and broadening of the worldwide organization**
- **TenCate Advanced Armour has now supplied ballistic solutions for protection of gunners on British warships**

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Sustainability / Environment

TENCATE OASIS™ IN LANDSCAPING PROJECT IN GAZIANTEP







**MARKET** – landscaping and recreation.  
**PRODUCT** – TenCate Oasis™ synthetic turf fibre.  
**TECHNOLOGY** – extrusion technology.  
**PROCESS** – synthetic turf fibres are tufted in backing and installed as part of the synthetic turf system.

# Synthetic turf on the right track

**Synthetic turf fibres from TenCate Grass have been used in a landscaping project in the Turkish city of Gaziantep. TenCate Oasis™ now graces the city tram line. The quality and natural appearance of the product were contributory factors in the choice of fibre.**

The tram rails in parts of the city now rest on a green bedding of synthetic turf – definitely enhancing the street scene in Gaziantep (South Turkey) in the process. This green area rejoices in the melodious name of the Emerald Necklace for Gaziantep. Highly appropriate: the tram connection runs in the form of a green necklace from one end of the city to the other.

The choice fell on the Bermuda Grass quality from the TenCate Oasis™ series of synthetic turf yarns. This synthetic turf fibre was selected because of the quality and realistic look & feel of the material. The synthetic turf yarns developed by TenCate in this respect satisfy all the demands of the customer, and the substantial technical support and rapid

delivery and installation set the seal on the decision. From tender to order took merely a week, while the installation of the 67,000 m<sup>2</sup> strips – as well as the load-bearing subbase – took no more than 27 days.

The turf system was installed by Hatko Sports Technologies, a good customer of TenCate Grass in Turkey.

The excellent result has spawned a sequel. Around this time director Güşan Hatko is signing a contract for a follow-up order. This relates to two new railway lines that will be completed before the end of 2011.

[www.tencategrass.com](http://www.tencategrass.com)  
[grass.europe@tencate.com](mailto:grass.europe@tencate.com)

## TENCATE CETEX® IN LIGHTWEIGHT COMPOSITES TIPPER BODY



A consortium of companies and knowledge institutes in Overijssel (a province in the Eastern Netherlands) has developed a lightweight composite tipper body for the transport sector. Ten Cate Advanced Composites has been involved in this project since its inception. The tipper offers advantages over traditional solutions from both an environmental and a sustainability standpoint.

# Tipper with composites

The tipper that has been developed is 7.5 metres long, 2.5 meters wide and about 1.5 metres high. It weighs approximately 2,750 kilograms, which is less than half the weight of the steel version. The body can be used for the transport of bulk products, such as asphalt, gravel, sludge, sand, rubble, agricultural crops and animal feed. The advantage of this sustainable, lighter and stronger tipper is that it can carry an extra two-ton load. Thanks to the use of suitable thermoset composite materials, the tipper is also resistant to chemicals and temperatures up to 180°C. When an empty tipper is being transported, vehicles use less fuel than with the present metal type. The composite tipper is also easier to clean.

### Improved versions

Not that the tipper has now reached the end of its development process. 'Between an initial prototype and the final mass-produced product there will undoubtedly be further improved versions', Harm Albers and Winand Kok (sales manager and product manager, aerospace, respectively) tell us. 'The use of thermoplastic composite material has also not been precluded and, of course, we remain alert to other developments.'

Ten Cate Advanced Composites' contribution to the tipper fits in with the line that has been charted: from components to systems and then structures. The new tipper is a product on the cutting edge of three elements: material,

process and design. The tipper is thus in line with the technological development of aerospace towards other applications, such as those for the automotive industry, and towards far-reaching industrialization. 'The automotive industry is characterized by high volumes, linked to continuing price/margin pressure. The industry recognizes the finiteness of raw materials and thus the need to reuse them.'

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# TenCate synthetic turf in the leading role

Coaches, stadium directors, architects  
... all are guided via e-mail to a special slot set up on the worldwide web: [www.tencatefootball.com](http://www.tencatefootball.com). It is a short, dazzling video clip on the Super Bowl and the leading role of TenCate in components and systems for sports such as American football.



The mass mailing is part of a publicity campaign on the occasion of Super Bowl 2011. The final of this annual football event took place on 6 February, when the Green Bay Packers went head to head against the Pittsburgh Steelers. The aim was to etch the name of TenCate in the memory of the end-user. Other elements of the campaign included a media offensive and the ESPN SuperBowl party. The Entertainment & Sports Programming Network is an American cable television network that broadcasts sports-related programmes 24 hours a day – and the logos of TenCate and ESPN are depicted on the turf!

## The leader

'We are the leader of the synthetic turf industry in the U.S. and worldwide', so runs the message. 'TenCate is the company that makes combat clothing for our troops, composite

materials for NASA's satellites and Predator, and supplies synthetic turf for the best teams in professional football. They all share the advanced technology developed by TenCate. We design our synthetic turf with the same care accorded to the materials for American soldiers and marines. This is demonstrated by sports fields for professionals and at universities and schools throughout the whole

country. TenCate develops synthetic turf with a passion, because we feel that a football field is more than sidelines and end zones. It is a stage to showcase the greatness of the sport and the sportsmen – a stage where character is formed and champions are created.'

[www.tencatefootball.com](http://www.tencatefootball.com)  
[www.tencategrass.com](http://www.tencategrass.com)

Safety / Protection

**TENCATE USA IN THE CENTRE OF POWER**

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# A new home in Washington, D.C.



View of the Capitol

**Since November 2010 TenCate has had an office in the United States at 101 Constitution Avenue in Washington, D.C. TenCate USA acts in a corporate liaison capacity and as a branding and marketing platform for all the TenCate companies in the United States.**

The new office is just a stone's throw from the U.S. Capitol and in the heart of Washington, D.C., capital of the United States. This is the seat of the Senate and the House of Representatives, which together form Congress (the legislative body). This location is no coincidence.

TenCate develops and produces materials for the protection of people, equipment and the environment (infrastructure), and it is often the public officials and governmental bodies that draw up the relevant specifications and issue tenders. One striking example of this is TenCate Defender™ M fabrics, which have repeatedly been chosen by the U.S. Army and the Marine Corps for combat clothing for their troops.

#### **Core activities**

Business promotion (stimulating sales) and brand equity (positioning the TenCate brand) constitute the main task of Public & Government Relations TenCate USA. Four core activities can be distinguished: government relations (contacts with government and elected officials), public relations (contacts with target groups and the media, brand management), internal communication (corporate public relations and communication) and agency relations. The last concerns relations with the U.S. Department of Defense and the U.S. Department of State (Ministry of Foreign Affairs), foreign embassies and international business councils. Tara Glover, vice president of Public & Government Relations, is location director and responsible for the strategy and activities of the office. Her immediate team includes two recent hires: Ken Collins, manager of government

relations for Geosynthetics USA) and Amber Landis, manager of public affairs. Assigned to each activity is a core team composed of external experts.

#### **The TenCate brand**

An advertising campaign is now underway to establish the TenCate brand in Washington. A recent, brand-oriented effort is the partnership with TenCate Grass USA in the run-up to Super Bowl 2011 (see article on page 39). This campaign was directed at important target groups, including representatives of schools, universities and the professional department of the NFL. Moreover, TenCate USA continues to work with TenCate Geosynthetics within the U.S, furnishing civil servants with information on the importance of TenCate materials in transport, infrastructure and environmental management.

TenCate USA will continue to develop its contacts in Washington, D.C. and present the U.S. operating companies of TenCate under a unified brand name. In 2011 the division will develop communication materials that will educate political officials and agencies on the important functions of TenCate's U.S. operating companies as a whole.

- **The TenCate USA location focuses on business promotion and positioning the TenCate brand**
- **TenCate USA is going to present the U.S. operating companies of TenCate under one unified brand name**

**[us.office@tencate.com](mailto:us.office@tencate.com)**  
**[www.tencate.com](http://www.tencate.com)**

Ken Collins, Tara Glover and Amber Landis





# Nomination of Bert Cornelese

The Supervisory Board of Royal Ten Cate intends to nominate Bert Cornelese for appointment as member of the Executive Board and Chief Financial Officer (CFO).



Mr. Bert Cornelese (1964) studied business economics at the University of Groningen (NL). He began his career in 1988 at Price Waterhouse Nederland as Audit Senior. From 1991 to 1998 he was employed as Controller and then as Financial Director for Vitatron. Subsequently he worked for more than three years as Holding Director and Director, Finance & Controlling for Beiersdorf and then for two years as CFO

Benelux for Smiths Food Group. From 2004 to 2009 he was employed as CFO Northern Europe for PepsiCo International. Up until his intended appointment he is working as Vice President and CFO EMEA of Biomet Inc.

As CFO, Bert Cornelese will follow in the footsteps of Jaap Lock, who is to retire as member of the Executive Board and CFO of

TenCate in the shareholders' meeting to be held on 21 April 2011.

Further information about the intended CFO will be provided in the notes to the agenda of the next shareholders' meeting



## TenCate publishes annual report for 2010

The TenCate 2010 Annual Report is a reality

In 156 pages TenCate presents in text, figures and tables a meticulous review of its activities and results in the operational, financial and HR areas in the financial year 2010. The annual report consists of a report section and a section presenting the financial statements. The whole report is enlivened with single photos and pages of photos showing applications of TenCate materials.

A link is also made to end-user marketing, one of the four cornerstones of the TenCate business model and also the theme of this annual report.

A hard copy of the annual report will be sent to you on request (0546 544 911). For the digital version, please visit our website: [www.tencate.com](http://www.tencate.com). Both the print and the electronic versions are available in Dutch and English.

# The shareholders meeting



TenCate will hold its annual meeting of shareholders in the afternoon of Thursday, 21 April. The venue will be, as it was last year, the business area of the Polman Stadium, the home base of Premier League club Heracles Almelo. Agenda items include: the explanation of and adoption of the 2010 annual accounts and of the profit appropriation and the composition of the Executive Board.

## The new TenCate CFO

Member of the Executive Board and CFO Jaap Lock will step down at the shareholders meeting. The Supervisory Board has nominated Bert Cornelese for appointment as his successor. We make his acquaintance.



## Connected

The theme of the annual report for 2010 is the connection with end-user marketing. In edition 2: efforts relating to approaches to end-users at the TenCate Protective Fabrics, TenCate Aerospace Composites and TenCate Advanced Armour market groups.



## Results for the first quarter of 2011

Background to the results achieved in the first quarter of 2011.



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# Peace of mind in danger zones

A secure society calls for elite troops that provide optimal protection: alert, well-trained people who carry out their tasks safely. These professionals must be able to rely on the protection of their equipment under hazardous conditions.

TenCate Defender™ M inherently flame-resistant fabric is lightweight and comfortable thanks to its breathability. The bullet- and stab-proof inserts are made of TenCate Liba®, the anti-ballistic shields of TenCate Targa-light™. Light yet strong, as well as impact-resistant. These high-tech materials make a difference by guaranteeing the best performance from those who protect civilians, while ensuring everyone a good night's rest.

[www.tencateprotectivefabrics.com](http://www.tencateprotectivefabrics.com)  
[www.tencateadvancedarmour.com](http://www.tencateadvancedarmour.com)

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materials that make a difference