

TenCate Update

No. 14 May 2007



Water basins turn into basins for water storage

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Royal Ten Cate TenCate in 2006

TenCate generated a net profit before divestments of € 34 million in respect of 2006, an increase of 27%. Sales rose by 12% to € 771 million, with an autonomous increase in growth of 5% in respect of last year. The operating result increased by 30% to € 50 million, representing an autonomous increase of 17.6%. Although the increase occurred over a broad front, it can mainly be attributed to the activities in protective fabrics (US), geosynthetics, aerospace and armour composites and components for printers and copiers. The consolidated EBIT margin increased from 5.6 to 6.5%.

Buy & build

Polyfelt, which was acquired at the end of 2005, has been fully integrated into TenCate Geosynthetics. This group now has close international cooperation. At the end of 2006 agreement was reached on the acquisition of Roshield (see page 4) and at the beginning of 2007 the acquisition of the artificial grass activities of Mattex Leisure Industries was completed (see page 9).

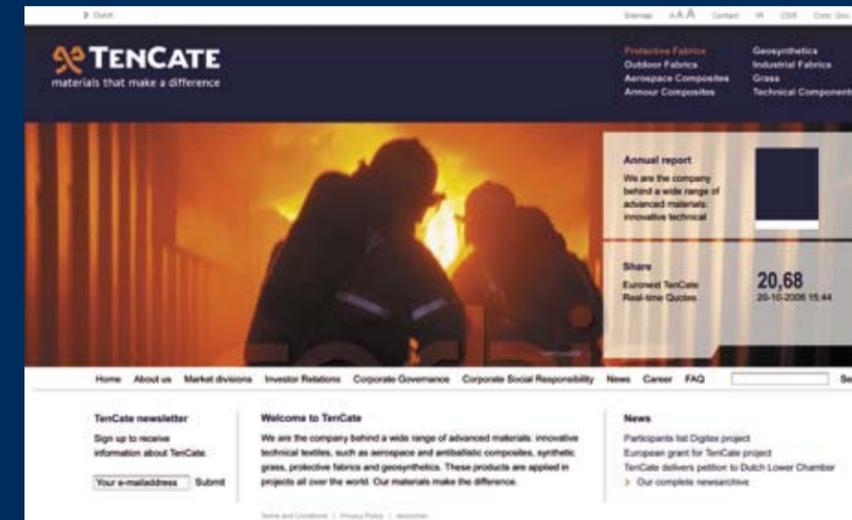
As a result of the cooperation with GreenFields, the TenCate Grass group has taken the first step towards strategic alliances with commercial organizations and their direct access to the end-user. At the beginning of 2007 TenCate entered into a worldwide strategic alliance with FieldTurf Tarkett, a leading marketing organization for artificial grass systems for sports use.

Fix it/exit

Significant progress was also made with our divestment policy. Both TenCate Plasticum and our interest in the Synbra Group were sold. This produced a major result on divestments. The profit recovery at TenCate Enbi continued during 2006.

Performance

The improvement in the operating result within the Advanced Textiles & Composites sector was remarkable. This was mainly the result of strong developments in the field of protective



Updated website

Around this time the TenCate website (www.tencate.com) is being updated. The site is the final piece in the branding project. On completion of the website all TenCate's communications will have been converted to the new corporate identity and corporate style.

The project has tackled, implemented and improved the design, contents and navigation of the site.

fabrics in the US and our growth in the sale of composite materials for Aerospace and Armour (ballistic protection). TenCate Protective Fabrics USA received two sizeable orders from the American army (page 4). TenCate Advanced Composites also recorded new orders, including ones from Boeing (type 787) and Embraer (Phenom 100 and 300).

The decline in the operating result of the Geosynthetics & Grass sector in relation to sales (EBIT margin) was mainly caused by our artificial grass activities. In the fourth quarter, measures were announced which will strengthen TenCate's market position in the artificial grass market and consequently improve margins.

Outlook

An ongoing rise in sales is expected in respect of 2007, partly as a result of the acquisitions we have made. For this year TenCate expects a growth in net profit, corrected for divestments, of at least 25%.

Changes in the Executive Board
During the Annual General Meeting of Shareholders held on 29 March, Mr P.H. van der Vorm retired as a member of the Executive Board. The proposed appointment of Mr J. Wegstapel as a member of the Executive Board was adopted during this meeting.



Application of geosynthetics

TenCate Protective Fabrics USA Million dollar orders

TenCate Protective Fabrics USA has received an order from the American army for fire-resistant fabrics with camouflage print. In addition, TenCate has developed for this army an entirely new material: Defender™. This material will be used for the new fire-resistant combat uniform. The two orders – depending on the details – will involve an amount of between \$ 54 and \$ 64 million. The orders are a follow-up to earlier large orders.

The American army will use the patented fire-resistant fabrics with camouflage print (GEN 2) to protect its personnel in aircraft, helicopters and armoured vehicles against fire and heat. TenCate Protective Fabrics has patents on the production technology of this material, which is both safe and comfortable.

The American army leadership selected Defender™ as the material for its new flame-resistant combat uniform. This clothing will provide protection against fire and heat to the American soldiers who are stationed in Iraq and Afghanistan. TenCate Defender™ is patented. The product was specifically developed to provide comfort, durability and adequate protection against burning. The costs of the material are, however, considerably lower than existing flame-resistant materials. The front-line soldiers do not currently wear flame-resistant uniforms. The military market for flame-resistant material is therefore expected to increase considerably.



Defender™ will provide the American soldiers in Iraq and Afghanistan with protection against fire and heat (archive photo)

The American army has asked TenCate to supply more than half of the required Defender™ material still in 2007.

TenCate Aerospace & Armour Composites

Roshield

The takeover of Roshield A/S was announced in December. Roshield is a leading, innovative company on the European market for vehicle armouring and personal protection. It is active on the European market and in Asia and is involved in major projects. The company is located in Odense (Denmark). Roshield will form part of the TenCate Aerospace & Armour Composites group.

Roshield develops, manufactures and markets customized materials on the basis of rubber and composite technology against hard core munitions in European core markets and other potential markets.

The technological knowledge, the distribution organization and the activities of TenCate and Roshield fit in well with each other. Both have already been working together commercially in the provision of solutions for ballistic protection for some time. The takeover has enabled TenCate to strengthen its leading position on the European market for personal protection and vehicle armouring. This international market position will now be further developed.



TenCate Protective Fabrics Göteborg opts for Millenia Light®

The Göteborg Fire Department has opted for TenCate Millenia Light® as the outer shell for its new firefighter uniforms, based on properties such as comfort and durability. Together with the fire department and garment-makers, a concept was developed for firefighter turnout gear for the Swedish Fire Department. This involves a total of 550 firefighter uniforms for the fire department.

MILLENIA LIGHT® is a comfortable outer shell that ensures optimal protection. It is exceptionally durable, and remains strong and flexible after exposure to extreme heat. Millenia Light is the lightest material with such a high degree of comfort and heat resistance, making it the optimal solution as an outer shell for firefighter uniforms.

Millenia Light® is an example of the commercial synergy between the TenCate companies in the Netherlands and the US. This is a great step forward for the firefighting market and

meantime several fire brigades have opted for Millenia Light®. The Swedish city of Göteborg has twelve continuously manned stations for firefighting and rescue operations, seven part-time stations and seven smaller sites. The rescue team or fire brigade can reach the scene of a disaster in Göteborg in an average of 6 to 7 minutes. Each year the brigade has to turn out some 6,500 times.



TenCate Geosynthetics Anti vapour cloth



As a result of the growing scarcity of water for drinking and irrigation, producers and users in arid areas (including southern Europe) are constantly searching for innovations in water saving. Through the incidence of sunlight and increase in the concentrations of salt, the growth of algae increases and the quality of irrigation water diminishes. Near the southern Moroccan city of Agadir, a trial project was started with TenCate Nicosun® anti vapour shade cover. This anti vapour cloth has now proved its worth in covering a water basin in the south of Spain. Until now more than 50,000 m² of TenCate Nicosun have been installed.

The size of the basins – 10,000 m² and more is no exception – requires a construction that is both light and strong. The cloth must also easily allow rainwater through (if it should rain). That's possible with TenCate Nicosun. It is supplied as a system solution, together with tension ropes (like a string of liquorice, but then a very strong version) and technical advice. In 2006 a patent was acquired for the major countries in southern Europe.



Use of GeoDetect® under a 50 m-long section of track on the Mouchard-Bourg line (France)

simple and quick to install, and durable. It can also withstand lightning, radiation and other natural phenomena.

Projects

In 2005 and 2006, 15 projects using GeoDetect were successfully completed in Europe, Africa (Dakar) and Asia (Malaysia, Singapore, Japan). The SNCF (France) has used GeoDetect on the Mouchard-Bourg line. GeoDetect, with five optic lines and 300 sensors distributed at 85 cm intervals, has been installed over a width of 5.30 m under a 50m-long section of track where the risk of settlement was most evident. A second project in France concerns the survey of the bridgeheads of a 16m-long bridge on the Route National 38 at Saint-Saturnin. Here, three GeoDetect strips have been installed in a 9.9m-high earth embankment reinforced with geosynthetics. Each strip contains one optic fibre with eight sensors.

Dike protection

HydroDetect® is a new development based on GeoDetect. This geotextile is buried in dike bodies. HydroDetect monitors the condition of the dike body and a warning is given if a defined value is exceeded. Changes in length and differences in temperature of just a few hundredths of a percent are registered. In this way deformations and strains, as well as leaks, can be detected. It is an effective way of monitoring the condition of dikes to ensure that any necessary measures are taken to prevent a breach.

Intelligent geotextile

GeoDetect is a geotextile-based monitoring system that TenCate Geosynthetics France has developed for application mainly in (rail)road construction. The system consists of a nonwoven geotextile and optical fibres. These are linked to a computer, thus enabling any changes in earthwork structures, which could have disastrous consequences for the overlying infrastructure, to be measured, and any deformations dealt with. GeoDetect is accurate,



HydroDetect® monitors the condition of dike bodies, as here in a trial project in France



Geotube - a versatile geosynthetic

Geotube® is an elongated 'sausage-shaped' geotextile that can be filled with sand or sludge and is eminently suitable for the installation of dikes and the dewatering of polluted ground. The geotextile acts as filter cloth (separating water and sediment) and as support cloth (holding unstable ground together). The system is cheaper than conventional techniques, is energy- and environment-friendly, and has a large processing capacity.

Geotube is proving its value worldwide – for example, at the Rijksmuseum in Amsterdam (picture top right). The museum is undergoing far-reaching restoration work, which includes the removal of a large number of floors and levels. This is releasing a lot of sludge, which is being dewatered by means of custom-made Geotube.

Geotextile (Geolon® PP80-L) was used in the installation of the whitewater course of Dutch Water Dreams (picture top left), a water sports complex in Zoetermeer. The whitewater course is 300 m long, 20 m wide, and has a height difference of 5 m (the course constructed for the 2008 Olympic Games in Beijing served as an example). The geotextile offers guaranteed floor protection.





A pavement restoration project in the US

Pavement restoration

TenCate Geosynthetics North America has recently begun to focus also on the restoration of pavements (asphalt recovery) and other road construction projects. The company has assumed the exclusive responsibility from Owens Corning for the marketing, sale and distribution of the TruPave® Engineered Paving Mat in North America. TruPave is recyclable, extends the lifespan of the pavement and dramatically reduces the costs of repair and maintenance. So it's an interesting product – also because sales of the product in 2006 increased by more than 40% globally. The use of the material means a saving on both raw materials and costs and it extends the life of the road.

Major repairs

During major repairs to the sewerage system in Orange County (North Carolina, USA), it emerged that the substratum could not cope with the weight of the big lorries needed to carry out the project. By using this geotextile from TenCate Geosynthetics, comparatively thin layers of ground over the work location could be rendered adequate. The road laid proved to be a highly cost-efficient and time-saving solution during the project, and has now become a permanent feature of maintenance work.

Restored railroad

One of the three prestigious IFAI awards that TenCate Geosynthetics USA carried off at the end of 2006 related to the restoration of part of the most important rail link of the Canadian Pacific railroad: the stretch across Telford Marsh in Ontario. This is a swampy area, so enter TenCate Mirafi®: a geotextile with high tensile strength that is eminently suitable for reinforcing and separating foundation soils. Six 10 x 50 m panels, each weighing approximately 400 kg, were folded in concertina fashion and sewn together on site. Rail traffic experienced little disruption, thanks partly to the fact that the geotextile can be rapidly processed.

Ring around Baltimore

Near Lutherville (Maryland, USA) the I-83 and the I-695 converge and for several kilometres form the beltway around Baltimore. Due to the increasing traffic, road widening at this location was badly needed – but then without harming the natural environment.

This was possible through the construction of a steep slope and, thanks to geotextiles from TCG North America, the slope was made sufficiently stable and the risk of subsidence avoided. The green colour of the material ensured that the transition between the countryside and the road was visually pleasing



Baltimore

TenCate Grass

Acquisition of Mattex

The acquisition by TenCate of the artificial grass activities of Mattex Leisure Industries was completed on 2 April. Mattex, which is located in Dubai, manufactures artificial grass fibres and other products and is specialized in the production and sale of monofilament fibres. The artificial grass activities will be taken over by a new company that is to be set up: TenCate Thiolon Middle East LLC, which will be fully integrated into the TenCate Grass group.



The demand for artificial grass fibres has increased sharply and is expected to grow even further, particularly in view of increasing acceptance within the football world. Despite the substantial expansion of capacity in Europe and the US, TenCate Thiolon was unable to entirely meet the sharp rise in demand in 2006. The takeover of Mattex will considerably enhance the strategic position of TenCate Thiolon and the Grass group and will also strengthen it in an operational sense. TenCate Thiolon will be able to target the entire market with a broad, distinctive product range and the Grass group will be able to anticipate more effectively the demand for customized fibres and artificial grass systems. As a result of increased efficiency and economies of scale, synergy advantages will also be achieved.

Alliances

TenCate seeks to achieve strategic and/or commercial alliances that support its quality concept. Partnerships with leading companies will make the market more aware of performance at a higher level. It will produce artificial grass systems with an added value for the end-users.

FieldTurf Tarkett

TenCate has entered into a worldwide strategic alliance with FieldTurf Tarkett, a leading marketing organization for artificial grass systems for sport applications. The organization has comprehensive knowledge of patented artificial grass systems. For TenCate the alliance provides improved access to the market, which will have a positive influence on the market share. This alliance will also provide considerable support to the strategic focus on systems and system characteristics.

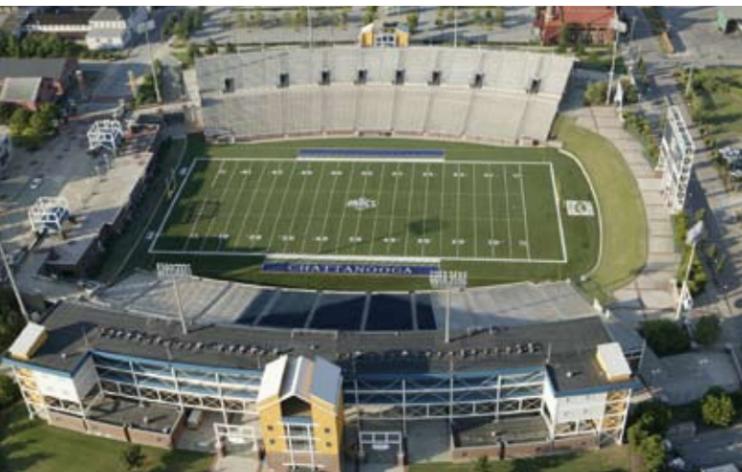
GreenFields

TenCate has signed a declaration of intent with GreenFields® with a view to strategic collaboration. GreenFields is a leading marketing company in the artificial grass market which is experiencing strong growth. The company is active on the market for both landscaping and sport. It has innovative concepts which fit in well with our wide range of system components.

TenCate, in close cooperation with GreenFields, will develop a new, fourth generation of artificial grass system. This new concept is based on an integrated artificial grass system, which is no longer composed of separate components (fibre, backing, infill and underlayer). In order to strengthen TenCate's current knowledge position, the patent in this field will be acquired from GreenFields, thereby significantly enhancing TenCate's existing worldwide patent position. The majority (80%) of shares in Landscape Solutions (artificial grass for landscaping under the Royal Grass® brand name) has been sold to GreenFields.



Royal Grass = ideal artificial grass for gardens and landscaping



Artificial grass in Finley stadium

The championship decider between teams from the Appalachian State University (title holder) and the University of Massachusetts was played at the end of December in Finley Stadium in Chattanooga (Tennessee) on a brand-new field based on artificial grass fibres and backing from TenCate Grass North America.

At first it looked as though problems with the previous pitch of natural grass would throw a spanner in the works, but replacing this field with an artificial grass system based on the TenCate Thiolon® XP Pro fibre saved the day.

TenCate sponsors solar cars

Once again TenCate Aerospace Composites is sponsoring two participants in the World Solar Challenge in Australia. Both the NUON Solar Team of Delft University of Technology and the Solar Team Twente are making their vehicle bodies from TenCate materials. Thanks to these materials, the teams will come under starter's orders in Darwin on 21 October optimally equipped. The Challenge takes the teams from Darwin to Adelaide, more than 3000 km away, where they will arrive on 28 October.

Two teams, two ideas

The Delft students are getting carbon and glass fibre fabrics from TenCate. They themselves are impregnating and compressing these into an ultralight, glass-smooth body for the NUNA 4. Their colleagues from the University of Twente are opting for TenCate Cetex®, the high-grade thermoplastic composite plating. This material is normally used in manufacturing lightweight components for aircraft.

Scarcity

Carbon fibres (also the basis of TenCate Cetex) are scarce. Without TenCate sponsorship, they would have been beyond – or almost beyond – the reach of the student teams. Using these high-tech materials gives the teams a headstart on the competition, so here too TenCate materials make a difference.

More information:

World Solar Challenge: www.wsc.org.au
 NUON Solar Team: www.nuonsolarteam.com
 Solar Team Twente: www.solarteam.nl



Photo: Nuon/Hans-Peter van Velthoven
 The NUNA 3; the design for the NUNA 4 will be unveiled in June.

Corporate Social Responsibility

Operating companies within TenCate are engaged in different ways on putting corporate social responsibility into practice on one of the People, Planet and Profit domains. It's often the case that measures that are taken not only benefit the environment but also produce a substantial saving in costs. Here too, materials from TenCate make a difference.



Lisbon

A thick layer of sludge had built up in the tanks at a waste processing company in Lisbon (Connecticut, USA). They had to be cleaned, but then without halting the process or switching off the incinerator.

Geotube® from TenCate Geosynthetics USA was used to catch the sludge from the tanks. A polymer was added to the Geotube, which had been purpose-built to fit into the confined space. This polymer ensured that the solid particles would bind together. The water which then trickled out was immediately taken up into in the company water circuit. The quality of the water was so good that no additional treatments were necessary. The Geotube, containing only the solid particles, could then be removed. Apart from the saving in time, a cost reduction of 40% was also achieved.

Panama City

The Arizona Chemical Company in Panama City (Florida, USA) does as much as possible to process its waste in an environmentally friendly manner. Through the use of Geotube®, the Arizona Chemical Company can carry out its waste water processing more quickly, cheaply and cleanly. The savings that are produced by use of this system are remarkably large: the volume of waste can be reduced to 90% and costs have been cut back by 40%. The process time has decreased by half.

credits

In publishing Ten Cate Update, Royal Ten Cate seeks to keep its business relations informed of the latest projects, product innovations and developments at its operating companies, and of any changes in the portfolio.

editorial office

Royal Ten Cate	
P.O. Box 58	+31 546 544 911
7600 GD Almelo	royal@tencate.com
The Netherlands	www.tencate.com

investor relations

F.R. Spaan	f.spaan@tencate.com
	+31 546 544 338

corporate communications

B.L. Lambregtse	b.lambregtse@tencate.com
	+31 546 544 306

design

ftpDESIGN, Hengelo (NL)

printing

Lulof Druktechniek, Almelo (NL)

may 2007



The Brazilian Embraer qualified TenCate Cetex for its new Phenom 100 and 300 business aircraft. There are now orders for several hundred planes. Embraer is also developing new parts based on Cetex.



ROYAL TEN CATE

Egbert Gorterstraat 3
7607 GB Almelo, NL

+31 546 544 911 Telefoon
+31 546 814 145 Telefax

royal@tencate.com
www.tencate.com

 **TENCATE**
materials that make a difference