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SGS

THE FUTURE BELONGS TO THE CONCRETE TECHNOLOGIST

Because of the continuing economic crisis, unemployment in many countries has increased considerably, especially among young people. Luckily, the situation is not so bad in the Netherlands, but in countries such as Spain and Greece overall unemployment is well above 20% and even 50% among the young. On the other side of the coin, there is a dire shortage of technically trained people. Germany, for example, is looking for more than 70,000 engineers. This has led to widespread recruitment of engineers from abroad.

Although we live in a century of technological developments, interest in technical studies is very limited. Young people are crazy about the latest electronic games, and internet usage is exploding, but the image of technical education does not seem to be "sexy" enough. Materials technology and concrete in particular only appeal to a small group of students. Concrete is the most used building material in the world and developments in this area are now going full steam ahead. Boring old 1-2-3 concrete has long since made way for new, high-performance variants such as (very) high-strength concrete, self-compacting concrete, and the like. Today's concrete also has greater functionality - improving building energy management, protecting the environment (fluid density), etc. Its effect on the environment (sustainability) is becoming an important part of concrete technology. A growing range of raw materials is becoming available for concrete. The role of the concrete technologist in collaboration with the designer and the contractor is therefore becoming increasingly important.

The concrete technologist of the future will have to command an increasingly broader range of knowledge and have strong communication skills, and will also hold a key position. This will be a challenging job with a promising future, especially at SGS INTRON, that applies knowledge and experience in the international arena.

GERT VAN DER WEGEN



Contaminated soil released during cleaning, sludges and mineral residues from industry ... BAG uses all these to make durable building materials under the name Vandolith®. Thanks to the technique of cold immobilisation, these materials are safe to use and comply with the provisions of the Soil Quality Decree. Cement and (sometimes) additives seal contaminants in the building material during cold immobilisation. BAG is convinced that support and demands for these secondary building materials are on the increase. With a new, ambitious management and changes to the legislation governing immobilisation, the way towards the market development of further products is wide open.

MUCH-USED FOUNDATION MATERIAL

Each year, BAG B.V. sells 120,000 tonnes of sustainable building materials with KOMO product certification from SGS INTRON. Because the company processes waste material that usually has no other use, it makes a significant contribution to maintaining the building material cycle and to reducing the use of primary materials. Vandolith® is widely used as a replacement for sand/cement mixes and as a foundation material under (heavily loaded) roads, parking lots, environmental parks, sports fields, greenhouses and impermeable floors, as backfill behind dam walls, for example, or for capping over landfill sites. Even the entire concrete foundations of buildings can be replaced by Vandolith®.

PRODUCTION ON SITE

The new management of BAG B.V., director Hans van der Stelt and manager Tony Smits, is extremely ambitious. "Within two years we want

BAG SEEKS TO EXPAND WITH SUSTAINABLE BUILDING MATERIALS

to double our production volume to 250,000 tonnes of products per year," says Smits. "We think we can achieve this growth by expanding our activities in the Netherlands." In the beginning, BAG was mainly active in the South-east of our country, where it collects residual material from the public and private sectors at several locations. Van der Stelt: "Where the waste-material streams occur generally determines the production location. It is not interesting from a logistics point of view to transport contaminated soil from Maastricht to Groningen and make the Vandolith® there. That eats away at the price and environmental benefits. That's why we look for strategic locations throughout the Netherlands where we can work with third parties to collect useable waste materials and process them into Vandolith® for projects in the region concerned. In addition, we focus on the possibilities of locating a (mobile) mixer or centre on site at large projects. In the most ideal of cases, there is soil from a decontamination project in the area, which can then be processed into Vandolith® at the project site and reused immediately. This will become more common in the future as the number of large building projects increases.

STRATEGIC LINK WITH STRUKTON

The recent organisational change at BAG has certainly been an advantage. Van der Stelt is also a director of the Netherlands Soil Bank, a part of Strukton that deals with the recycling of all materials, including soil, generated during building projects. At the same time as it was established, Strukton also became a shareholder in BAG. The link between the two companies gives BAG direct access to the market on which it will concentrate in coming years - the market for mixed cement materials with a high compression



On the left Hans van der Stelt, on the right Tony Smits.

strength. In other words, that means concrete applications. "Strukton is a leading builder of civil works in concrete," explains Van der Stelt. "These constructions can use several kinds of concrete, depending on the strength and function required. Where weight is a key consideration, the concrete can often be replaced by Vandolith®."

BRL EXPANDS USE OF WASTE MATERIALS

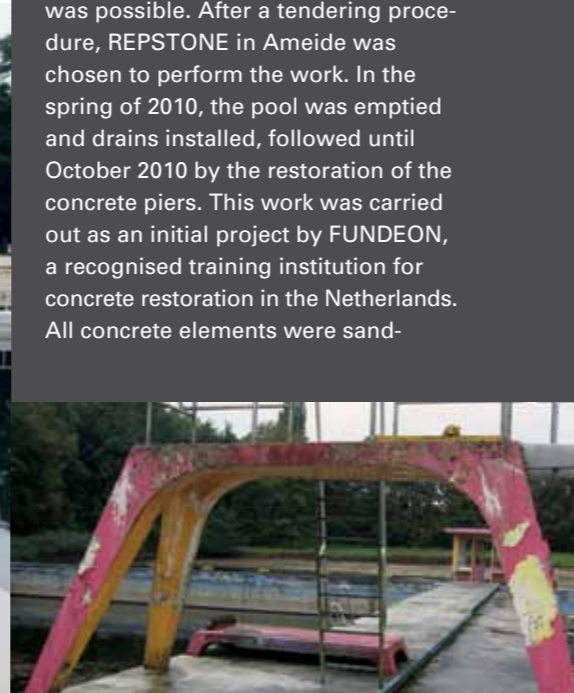
Where BAG sees new applications, the company develops new products. The new guideline BRL 9322 for immobilises enacted on 1 July 2012 creates the conditions for this. Tony Smits: "Until now, BRL 9322 stipulated that used materials must consist of 80% soil or incinerator ash, and a maximum 20% of other waste materials. In the new BRL, the main component can consist of several waste materials in various proportions. That gives us the opportunity to make products with other properties and application possibilities, better matched to the wishes of the customer."

RESEARCH REMOVES UNCERTAINTIES

BAG sees SGS INTRON as an excellent sparring partner here. Smits: "We've been working closely together for years. SGS INTRON helps us with the quality assurance and certification of our products, and also carries out a lot of environmental investigations such as leaching tests. We deliberately chose to outsource to an independent, external laboratory. That was not only because SGS INTRON has considerable in-house experience in that area, but also so we could provide our customers with extremely reliable product information. Because we process contaminated materials in our products, there is often some anxiety with regard to the future, especially among managers. What will happen with the material in 20 years? Will it always be safe for the soil and groundwater? The Soil Quality Decree looks to a period of 100 years. We are confident that our product can last that long without problems, but we need SGS INTRON to demonstrate that. They have the specialised concrete and environmental knowledge needed to extrapolate research results for the future."

WINTERSWIJK LIDO

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"It was exciting to be able to indicate accurately which sections could be retained. You couldn't see from the outside exactly what the condition of the internal concrete was," says project manager Martin Verweij.

THE RESTORATION

The conclusion was that restoration was possible. After a tendering procedure, REPSTONE in Ameide was chosen to perform the work. In the spring of 2010, the pool was emptied and drains installed, followed until October 2010 by the restoration of the concrete piers. This work was carried out as an initial project by FUNDEON, a recognised training institution for concrete restoration in the Netherlands. All concrete elements were sand-

blasted and cleaned. Sections of the piers that could not be repaired were removed and replaced in the same size and detail as the original structure (including using a formwork of pine slats).

The top of the decks and the sides of the longitudinal beams were given a permanent waterproof, crack-bridging and elastic coating. The other concrete sections above the waterline (bottom side of the decks, joists, bottom and inner longitudinal beams and columns) were given an attractive, vapour-permeable coating to prevent further water transport into the concrete.

THE RESULT

The result is impressive. The restored complex has been made beautiful again. The piers and the characteristic starting blocks and diving towers have been restored (see photo). Since summer 2011, the pool has again been used for swimming, just like in the good old days!

The outstanding beach complex in Winterswijk built in the 1930s as a job-creation programme is an important part of the history of Winterswijk. The entire complex, with its pavilion, concrete piers and outdoor area is a national monument. In 2001, the lido was closed because of poor water quality and the structural condition of the complex. In 2007, the council decided that this unique and culturally historic complex was sufficiently valuable to be restored. In June 2009, work began on the actual restoration, and in June 2011, the restored lido reopened for use.

One part of the restoration was the repair of the concrete piers and diving tower (see photo). In consultation with the National Heritage Board (RCE), SGS INTRON carried out extensive investigation of the damage mechanisms in the concrete structures at the lido. They also provided repair advice that served as a starting point for the restoration call for tenders.

THE DAMAGE

The investigation consisted of a visual inspection, on-site measurements and the taking of drill cores and dust. Different kinds of cracks were discovered, caused by thermal dilation, mechanical loads, settling and expansion reactions. The expansion reactions were potentially dangerous ASR, a possible combination of sulphate attack and frost damage. This damage was caused by long-term moisture transport through locally porous concrete. A considerable portion of the concrete structures was seriously degraded. The expansion reactions were still occurring. There was widespread surface damage attributable to a concrete layer that was of insufficient thickness and quality locally.

EXTENSIVE GROWTH OPPORTUNITIES IN A DIFFICULT MARKET

BY WIM VAN LOON (EXECUTIVE DIRECTOR SGS BENELUX)

ORGANIC GROWTH: + 10%, TOTAL TURNOVER
CHF 4.8 BILLION: + 13.7%, OPERATING
MARGIN RESULT: +17 %, NO. EMPLOYEES
WORLDWIDE: 67,633 (AS OF 31/12/2011)

The strong results for SGS in 2011 owe their success to three key elements. First of all, there is the diversity of markets where SGS is active. This reduces the company's exposure to difficult market conditions. In addition, the growth of SGS is driven strongly by new legislation, plus the overall growth in the market. The good results also indicate that the ambitious strategic PLAN 2014 defined in September 2010 is beginning to bear fruit.

STRENGTH THROUGH DIVERSIFICATION

SGS is active in 10 different business lines: Agriculture, Automotive, Consumer Testing, Environmental, Governments and Institutions, Industrial, Life Science, Minerals, Oil Gas & Chemicals (OGC), and Systems & Services Certification. SGS provides its services throughout the world, working from a greatly expanded network in more than 140 countries. This diversification in services and regions makes SGS strong. It is how we have been able to cope successfully with the more difficult market conditions we saw in 2011.



2011 was a difficult and turbulent year. The market experienced a slow recovery and even though there was an upswing in local demand in some developing countries, the major economies are still experiencing difficult economic conditions. The fear of further instability in Europe increased again towards the end of 2011. Global industrial production and trade were affected by the

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INSPECTION AND MAINTENANCE OF STEEL STRUCTURES IN COVERED SWIMMING POOLS

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Following the collapse of (parts of) ceilings in covered swimming pools in the Netherlands some years ago and a similar accident in Switzerland which unfortunately led to several deaths, the Ministry for Housing, Regional Development and the Environment (VROM) sent out an Inspectorate notice in 2002 to inform all councils in the Netherlands of the risks of (suspended) steel structures and fastening systems (suspended stainless steel systems). In 2004, VROM drew up a practical guideline for the inspection and maintenance of (suspended) structures and fastening systems in covered swimming pools, and sent it to all councils and branch organisations. In the wake of a fatal accident in a swimming pool in Tilburg on 1 November 2011, the VROM Inspectorate listed the action councils had taken in relation to monitoring and enforcement following the VROM Inspectorate

notice, but found that the problems of (suspended) steel structures and fastening systems had not been adequately resolved.

The Housing Act sets out the safety requirements for structures, including swimming pools. The Building Act, which comes under the Housing Act, again sets out the requirements for the structural safety of buildings. The responsibility for complying with the Building Act and with the maintenance obligation under Article 1a lies with the owner or person authorised to take such action (operator/manager). Under Article 5.1 of the general environmental permit provisions (Wabo), the council is responsible for the administrative enforcement of such things as building regulations, including their interpretation, in its enforcement policy. As part of its monitoring and enforcement role, the council



should ensure that the owners of covered swimming pools carry out regular inspections of (suspended) steel structures and fastening systems. The owner must therefore ensure that no safety risk is present or ongoing. Owners of covered swimming pools have primary responsibility for the regular inspection and replacement of (suspended) steel structures and fastening systems. SGS INTRON experts carry out these inspections according to the NACE Benelux MIS-1203-2012 method. This method involves a risk analysis of the (suspended) steel structures and fastening systems, and specifies measures to be taken immediately and those for the longer term. In this way, risk areas are mapped, enabling specific maintenance to be undertaken.

ACCOUNT MANAGER MARIO DELAMBOY: “BECAUSE I KNOW THE ORGANISATION WELL, I’M IN A BETTER POSITION TO HELP CUSTOMERS.”

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INTERNALLY, EVERYONE KNOWS WHAT YOUR QUALITIES ARE BUT FOR THE CUSTOMER YOU’RE A RELATIVELY NEW FACE.

“That’s why I’m happy to take this opportunity to present myself. I’ve been at SGS INTRON since 1992. I’ve come to know the organisation very well from working in a variety of roles in the laboratory, quality and project management, IT and on the works council. I know what expertise is available and who I can approach - inside SGS as well. In cross-business consultations I have regular contact with SGS professionals from other disciplines. This wide network means I can give a lot of help to customers.”

WHAT IS YOUR BACKGROUND AND WHAT WAS YOUR FIRST JOB AT SGS INTRON?

I studied analytical chemistry at Zuyd Polytechnic and started as a chemical analyst in the laboratory. I worked mostly analysing asbestos using electron microscopy. It was a great job, mainly because I did the whole process: customer contact, receiving samples, analyses and reports.”

IN 1997, YOU BECAME QUALITY MANAGER. WAS THAT AN ADDITIONAL CHALLENGE BECAUSE THE LABORATORY WAS ACCREDITED?

“Certainly. In 1990 (SGS) INTRON had one of the first accredited laboratories in the Netherlands. This means that we not only have to follow the procedures that ISO 17025 certification entails, but our services - our measurements - must also meet a specific quality level. We had to work hard to make the system comply with the standards current at that time. My laboratory experience was very important there. I learnt the ins and outs of quality management by following courses myself.”

AND WHEN THAT WAS OUT OF THE WAY, WERE YOU READY FOR THE NEXT STEP?

“I like the fact of learning something early on and then moving on. Once the quality system was up and running, I transferred its responsibility to someone else. The next challenge came along naturally. As quality manager, I set about making all documentation easier to access. Because I’ve been messing about with computers since I was 12, it was a breeze for me to make the quality manual available in digital form. Then in 1999, when the project management system in the lab was no longer adequate, I started developing a tailor-made system. The software now ensures that we can administer and handle jobs efficiently.”

SGS INTRON EMPLOYEES IN THE SPOTLIGHT



“Yes, you could say that. I also trained as a software developer. In my next job as laboratory project manager, I was occupied 50% of the time with automation. When I saw that an external IT company couldn’t deliver in that area, I said to myself: ‘I can do that better.’ When I was on staff in IT in 2005, I was able to prove it. I had developed a second project management system for the Consultancy section. Certification followed later and in 2010 we worked as an IT group on the integration of the SGS and INTRON systems. It’s now a stable system with all parts connected to each.”

WHERE DOES THE DESIRE TO BE CONSTANTLY CREATING AND IMPROVING COME FROM?

“It gives me great satisfaction to be able to really help people. It’s the same now when I have contact with customers, but it was always my motivation for internal functions.”

THIS YEAR, YOU’LL HAVE BEEN WITH US FOR 20 YEARS. HOW DO YOU SEE SGS INTRON?

“If I had to sum up SGS INTRON in three words, they’d be professional, honest and family. These three words are absolutely synonymous with integrity to me as a person. Honesty lasts longest and sleeps best. In addition, I couldn’t settle into a company where there are no ties with colleagues. By listening closely and putting myself in other people’s

shoes, I’ve been able to come up with solutions that work. I take their professionalism for granted.”

WHAT WAS YOUR ROLE AS CHAIRMAN OF THE WORKS COMMITTEE LIKE DURING THE TAKEOVER BY SGS?

“It was very exciting and at the same time a fun and educational experience to be negotiating with SGS management about a social covenant. Ultimately the aim was to work together to achieve something and that’s what happened. The experience taught me to detach myself from the technical work and to work in a more people-orientated way. At the same time, I ceased to see my work in the IT area as a challenge.”

SO IN 2011 YOU WENT ON TO BECOME AN ACCOUNT MANAGER. DO YOU HAVE A PARTICULAR SPECIALISATION?

“My customer group is very broad: road builders, engineering firms, governments and other parts of SGS. At present, I’m concentrating on activities related to bitumen. After cement, it’s the most important binder in construction. I’ve learnt a fair bit about it but I’m not a specialist. There are enough specialists at SGS I can get involved in a contract. Bringing parties together is my strength. I’ve had contracts for all three sectors. The challenge now is to take things further.”

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terrible earthquake and tsunami in Japan, the political instability in the Middle East and North Africa which drove the oil price higher, and the continuing financial crisis in Europe, which forced governments to undertake dramatic austerity measures.

The growth in the group in 2011 was led by our Minerals, Consumer Testing, Industrial and Environmental activities. Here, SGS profits from new market opportunities in different parts of the world, and these more than compensate for the difficult local market conditions in Europe.

NEW LEGISLATION: INCREASING SECURITY AND SAFETY

Increasing product variety, the greater expectations consumers have of the products and services offered to them, the increased awareness of society generally when it comes to integrity and ethical business practices, plus increasing concern for our environment are all factors to consider. The international market translates these trends and expectations into new legislation. Legislation forms the basis of a major part of the activities SGS undertakes, and in that way guarantees the quality of its products and services. The fuel you put in your car, the car you drive to work each day, the lunch you share with your customer, the medication your doctor prescribes: SGS ensures that the quality of products and services complies with the legislation so you can operate in full security and safety. SGS has more than 600 accreditations in the Benelux countries alone. 25% of group turnover in Benelux comes from its laboratories for (petro) chemical, food, consumer and electronic products, environmental labs and labs for testing building materials.

STRATEGIC PLAN 2014: INVESTMENT FOR THE FUTURE

In 2010, the group defined strategic PLAN 2014 which sets out ambitious targets for the group. In 2011, a variety of investments were made for the further development of new, innovative services to provide support for the organic growth of the group in coming years. The group also supported its growth ambitions through acquisitions. In 2011, there were no fewer than 22 acquisitions which together accounted for CHF 80 million in sales. Although the SGS Group recognises that market conditions will be difficult in 2012, strong growth and profitability is expected, with the investment plan for the 2014 targets continuing at full pace.



ALLIANZ RELIES ON SGS INTRON EXPERTISE FOR PRODUCT WARRANTY INSURANCE

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Allianz Nederland - part of the Allianz Group, one of the largest financial institutions in the world - wants to be known and recognised as a flexible, market-orientated group with extensive business knowledge and a good range of services. One special product in their portfolio that is only occasionally offered in the world of insurance is product warranty insurance. Allianz provides this only to good customers in the construction industry - companies with high standards when it comes to quality. The specific nature of warranty insurance: the long-term insurance of quality supplied by third parties and the extent of possible damage claims in the event of a product fault or the bankruptcy of the manufacturer make it necessary for Allianz to address those risks as best it can. SGS INTRON plays a key role here.



INSURING WHAT THE MANUFACTURER PROMISES

"With product warranty insurance, we cover the warranty a manufacturer offers its customers," explains Niek Vonk from Allianz. "If he guarantees that his roofing will remain waterproof for 10 years, we insure the promise of waterproofness. But obviously we don't do that without knowing whether the product can actually fulfil the promise, not just now but also in 10 years' time. We insure only those products that have proven themselves or where research has shown that they meet the manufacturer's promise. SGS INTRON tests products or, on the basis of test reports, assesses whether they meet the specified performance requirements."

NOT TRUST BUT SUBSTANTIATION

It is also important for Allianz to know whether the manufacturer is in a position to provide the guaranteed quality for the whole lifetime of the insurance policy. In other words, is he totally on top of his process? Niek Vonk: "We need an expert partner in order to be as certain as possible in both areas. That's to say a partner who not only says we think something can be done but who can back up this conclusion with facts. SGS INTRON has the necessary expertise in house, as well as considerable experience in evaluating quality systems. The latter is very important for us because when you talk about providing inherently good quality, you're soon talking about certification. For product warranty insurance, we generally ask for quality declarations or certificates such as ISO 9001 and KOMO."

RELEVANT RISKS

Allianz has been working with SGS INTRON since 2006. This arrangement was recently set out in a framework agreement. The inspection regime consists of two main components: an initial inspection and checks during the lifetime of the insurance policy. SGS INTRON provides its services in both cases. During the initial inspection, the product is tested for the performance to be insured. "We map out the risks that are relevant for the policy," says accountmanager Cas de Roos from SGS INTRON. "It can be all sorts of building products: roofing, artificial grass, noise barriers, coatings, cellar sealing, modified wood ... you name it. Sometimes the application is also insured. We don't only test to see whether the product complies but we also check on site whether it's been installed correctly."



Niek Vonk

CONTINUOUS FINGER ON THE PULSE

Once the product warranty insurance has been concluded, SGS INTRON keeps track of the manufacturer during the life of the policy. Cas de Roos: "We carry out assessments at their office and/or at the manufacturing site to check whether the company is abiding by the agreements in the policy. This might involve making sure the quality checks are being carried out correctly. We focus mainly on the factors that could increase the risks for Allianz. Using the assessments that we report to Allianz, we formulate subsequent steps and propose any potential policy modifications."

ICING ON THE CAKE

Allianz generally sets the bar quite high: "If a manufacturer guarantees 10 years' durability, we ask SGS INTRON to show that the product will last longer - 20 years, for example," Niek Vonk confirms. "Our requirements don't always agree with those covered by certification. Every product warranty insurance policy is tailor-made and preceded by a lot of hard work. We only take this route if companies can convince us from the outset that they have the desired quality and quality assurance in house." If SGS INTRON can then demonstrate that the product meets the promises and continues to monitor the company over subsequent years, it's hard for anything to go wrong. That's also a precondition for use agreeing to this kind of insurance," Niek Vonk emphasises. "With the risks reduced to a minimum, the manufacturer can regard the product warranty insurance as the icing on the cake - proof for his customers that he's supplying a good product and one that Allianz is willing to insure for 10 years."



GROUT INJECTIONS FOR BORKUM WEST II WIND FARM

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Trainel Aachen GmbH & Co KG, specialists in the construction of wind farms, will be creating an offshore wind farm just off the German coast, some 45 km north of the island of Borkum.

Borkum West II wind farm, consisting of 80 wind turbines spread over an area of 56 km², is designed in the future to generate total energy of 400 MW.

The windmills used in the farm have a tripod construction. They are supported on piles. During erection, the hollow feet of the windmills slide over the heads of the piles. The space between the feet and the piles is then injected with grout, a mixture of cement and seawater.

There are no technical guidelines in Germany to cover the composition and quality of the grout in these structures. Trainel Aachen GmbH & Co KG have commissioned a test protocol which, among other things, will serve to monitor the quality of the grout used. A number of onshore trials have been carried out at Edinburgh in Scotland to support this test protocol.

SGS INTRON in collaboration with SGS Hamburg has inspected and documented these trials. The offshore work itself will start in the middle of this year. SGS INTRON will also be responsible for inspecting the work.

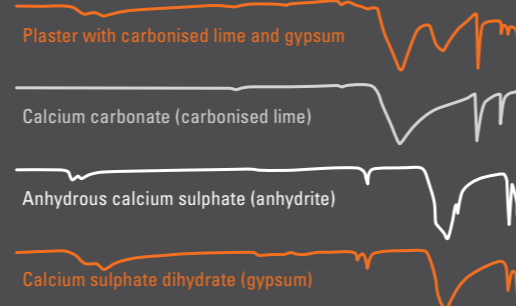
THE COLOUR REVEALS THE COMPOSITION

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We often use infrared spectrometry in the laboratory at SGS INTRON in Sittard to identify unknown materials. This powerful technique, also known as ATR/FTIR, can determine the composition of organic and mineral samples without any complicated sample preparation. By irradiating the sample with infrared (IR) light invisible to the human eye, this technique allows us to measure the infrared "colour" of the sample. Unlike colours in the visible spectrum, the infrared colour is characteristic of the composition of the sample. The molecules in the sample absorb specific wavelengths of the infrared radiation, yielding one (or more) unique infrared spectrum for each substance. The use of standard or reference spectra of known substances allows us to interpret the spectrum of the unknown substance and look it up in reference libraries often containing thousands of spectra.

WHAT'S IN IT?

The lab is often asked this question and when we investigate, the use of ATR/FTIR can often reveal interesting information and give us an idea of the composition of the unknown material. The results of the measurements relate to the overall composition. Infrared spectrometry is not suitable for identifying trace elements. Generally speaking, substances in low concentrations, that is below a few percent, are difficult to detect. The measurement results are qualitative, meaning that we identify the type of sample without measuring the concentrations of the substances present. Unfortunately, there are also a few substances such as metallic compounds and carbon which do not absorb infrared radiation, and the technique is not suitable for them.



HOW SMALL CAN THE SAMPLE BE?

ATR/FTIR analysis only needs a small grain of material or a drop of liquid, and that is handy where very little sample material is available. We often use this technique in combination with microscopy. Under the microscope, we can select the parts of the sample that are interesting for the analysis and if necessary, we can even irradiate microscopically small particles by connecting the ATR/FTIR directly to the microscope.

WHAT CAN ATR/FTIR DO FOR YOU?

Infrared spectrometry is used successfully to identify coating types or for determining the fingerprint of a desired coating system. This fingerprint allows us easily to establish whether the product used meets the set criteria. For restoration work, it can be important to determine the type of binder used or, for example, whether lime or gypsum or a mixture of both has been used, such as when sticky spots are found on the floor of a parking station, or white spots on a facade. ATR/FTIR shows the composition clearly.



SGS INTRON HELPS OPTIMISE THE QUALITY OF INNOVATIVE A4 TUNNEL CLADDING

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In an attempt to increase traffic flow and road safety, the Department of Waterways and Public Works has widened the A4 to 3 lanes in both directions between the Burgerveen junction and Leiden-Zoeterwoude. The first phase of this project was completed last year. At the end of 2010, a second aqueduct went into use under the ring canal, and this year the first aqueduct will be ready under the Old Rhine. This aqueduct will involve the A4 being sunk over a length of 1,400 metres to lie in a semi-open tunnel and improve the quality of life of the surrounding environment. An innovative, fire and noise-retardant cladding from the British company Quietstone was chosen for the wall and ceiling sections. Because this product had never been used in these circumstances in the Netherlands, SGS INTRON was asked for its assistance.

QUALITY ASSURANCE AT QUIETSTONE

Campen Industries B.V. and BAM Infra (Redubel), respectively, are responsible for installing the tunnel cladding on the tunnel walls and ceilings. Both companies asked SGS INTRON to help with setting up quality requirements for the tunnel cladding and testing the cladding in situ. The product that Quietstone makes is a porous material consisting of fine, stone-like aggregates (1-3 mm), held together by a polymeric binder. As a first step, SGS INTRON consultants at the request of both constructors analysed the Quietstone manufacturing process in England. Various improvements were made

in consultation with all parties involved, both to the manufacturing process and in quality control.

INVESTIGATION UNDER TIME PRESSURE

SGS INTRON then took a closer look at potential risks such as fatigue and material creep. This investigation called for a special combination of skills: knowledge of polymers plus the bonding of stone materials. "We also checked the quality of the Quietstone products supplied for the A4 project," explains SGS INTRON consultant Jo van Montfort. "Construction of the cladding had to be ready in February 2012. That meant a large quantity of

GERT VAN DER WEGEN

NEW CHAIRMAN AT STUTECH

At a members' meeting on 14 February this year, Gert van der Wegen was elected chairman of Stutech, an educational organisation of and for concrete technologists. Information exchange between concrete technologists is promoted through activities such as lectures, study groups and excursions. Stutech has some 250 members from all sectors of the concrete industry. Because ever more functional demands are being placed on concrete and a wider range of raw materials is available for concrete, the role of the concrete technologist is becoming increasingly important, sometimes in collaboration with designers and contractors. That is why Stutech actively seeks collaboration with fellow organisations both in the Netherlands and in surrounding countries. This is an exciting phase in which concrete technology and therefore Stutech find themselves. Gert considers it a privilege to play a part with the committee and the members.

material had to be manufactured and checked at high speed. We received samples for checking, and tested them in minimal time for material properties such as modulus of elasticity, density and compressive strength. Within a few days, we had to produce an acceptance or rejection report. Our lab staff were on continuous standby for months to carry out this tough job, so we're very pleased it all worked. We served the customer with our knowledge and speed of handling to the best of our abilities and were able to make a substantial contribution to the quality of this wonderful project."

SPORTS GROUND USERS VERSUS BUILDERS: HOW DO YOU CREATE THE BEST CONDITIONS FOR TOP PERFORMANCE?

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One of the sports our small country excels at is hockey. Last February our national women's team gave a world-class performance during the Champions Trophy in Argentina by winning bronze. The Netherlands plays a fast game that requires a perfect surface. The quality of the fields where games and training are held is very important for delivering top performance," stresses Chantal Mies from the Royal Netherlands Hockey Federation (KNHB). How do users and builders of sports fields come together to create the best surfaces? We asked Chantal Mies and Theo Ceelen from Ceelen Sport Constructies B.V., the largest builder of artificial fields in the Netherlands.

GOOD SPORTS FIELDS

"A good field for the sportsperson is not by definition also a good field for the client," Theo Ceelen emphasizes. Ceelen Sport Constructies (C.S.C.) is fully committed to consulting on the design and layout of sporting facilities - from synthetic, artificial and natural grass - for all kinds of outdoor sports. "While sportspeople place value mainly on the technical characteristics of the field, such as damping and ball roll, the client also considers the field life and costs to be very important. Fortunately we follow good standards in the Netherlands, so we have fields that meet the wishes of both sportspersons and clients."

HOCKEY ASSOCIATION: SAFETY FIRST

The Netherlands has many high-quality artificial grass facilities, Chantal Mies finds. As a senior policy advisor to the Hockey Association, she also oversees the quality of facilities. "We try to be a knowledge intermediary by following new developments closely, providing information and bringing parties into contact with each other. I join builders, artificial-grass manufacturers, consultants and certification institutes such as SGS INTRON on working group 6, one

of the working groups under NOC-NSF where the standards for sports facilities are established. As the Hockey Association, we also set down the rules the facilities must meet. Safety is number 1 in our association's regulations - for sportspeople and their audience. If safety becomes an issue for any reason, that's a reason for us rejecting a particular field."

PERIODIC FIELD INSPECTIONS

Fields are seldom inspected during competitions thanks to the periodic inspection system used by KNHB. Chantal Mies: "Because we have Dutch hockey fields inspected regularly, any defects usually come to light quickly. If a field is on the borderline of the standard, we inform the club. It can then take action in time and carry out the required maintenance or repairs. By giving good advice to clubs on maintenance, for example, the KNHB tries to extend the service life of fields. Durability is very important," says Chantal Mies. "The ultimate service life depends on the type of field and the intensity of the games played on it. In the case of a field that costs 3-4 hundred thousand euros, the club expects a minimum life of 10 years."



MULTIFUNCTION FIELD

The durability of structures is one of the main areas of expertise at SGS INTRON. Theo Ceelen expects more use to be made in future of the expertise available in this area. "As a specialist in sports field construction, we want to be the best. That can only happen through continuous innovation. We are used to high quality in the Netherlands, but it can be even better. The best artificial grass turf - with the feel and technical characteristics of natural grass - has not yet been made. And there are still many possibilities for extending turf life and durability. One step in this direction is our eco-fields, where we guarantee that all materials are recyclable. And why shouldn't we add more features to a field? Think of solar cells. Or - one of our most recent developments - a field with a water reservoir under it where we can collect rainwater for watering in dry periods. Very interesting in areas where water is scarce!"

PROCESS CERTIFICATION: RESPONSIBILITY WHERE IT BELONGS

C.S.C. is also experimenting with fibre types and lengths, stitching instead of gluing artificial turf, and different ways of filling and tufting. "Last summer we laid two woven artificial grass fields," says an enthusiastic Theo Ceelen. "There was a big difference in technical characteristics." SGS INTRON approves the new systems from C.S.C. for inclusion on the sports floor list so they can be used in the Netherlands, and after they have been delivered to the project site. C.S.C. itself checks during the building process. Theo Ceelen: "We stress the importance of a process certificate. The responsibility for a project lies where it belongs: with the contractor. We show that we are in control of our process and in the meantime inspect our work. SGS INTRON randomly checks that we are doing things right. Laying sports fields is a profession that calls for a lot of skill and where we as specialists want to provide the highest possible quality."

SPECIALIST TEAM DETERMINES CONDITION OF STRUCTURES ON THE VELUWE

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Together with Grontmij, SGS INTRON has recently inspected and assessed 37 viaducts and underpasses on the Veluwe, the A12 and A30. The investigation is part of a Grontmij contract from the Department of Waterways and Public Works to determine the overall condition of the motorway. This is done by taking samples of such things as asphalt, subsoil, embankments, noise barriers, guard rails, drains, light poles and other structures on sections of the A12, A30 and A50. The findings will be used as a starting point for a DBFM contract (Design, Build, Finance, Maintenance), a contract where the contractor is responsible for widening the A12 between Veenendaal and Grijsoord, and also includes up to 18 years' maintenance on these parts of the A12, the A30 between Barneveld and Ede, and the A50 between De Slenk and Grijsoord.

INVESTIGATION OF SECTIONS AT EXTRA RISK

SGS INTRON is involved in this complex project because of its expertise in the areas of concrete inspection, concrete degradation and maintenance. In order to estimate the problems to be expected and which sections of the structures are at additional risk, a team from SGS INTRON and Grontmij carried out a case study as an initial step. It was used to define focus points during the inspections. Here too, SGS INTRON and Grontmij operated as a team. The specialists from SGS INTRON mainly brought their maintenance knowledge and experience to the table, while Grontmij experts evaluated the structural aspects of the constructions.

AS MUCH INFORMATION AND AS LITTLE DAMAGE AS POSSIBLE

On the basis of the study and visual inspection, SGS INTRON indicated 200 locations for taking samples from structures. A lot of careful work went into this. Radar was used to look for the presence of reinforcing, so the chance of hitting it was minimal. The chloride content was investigated at the SGS INTRON laboratory in more than 800 samples. SGS INTRON consultant Maarten Swinkels: "Then again from a risk point of view, we assessed the consequences of the defects found and indicated the kind of maintenance work to be expected in coming years."



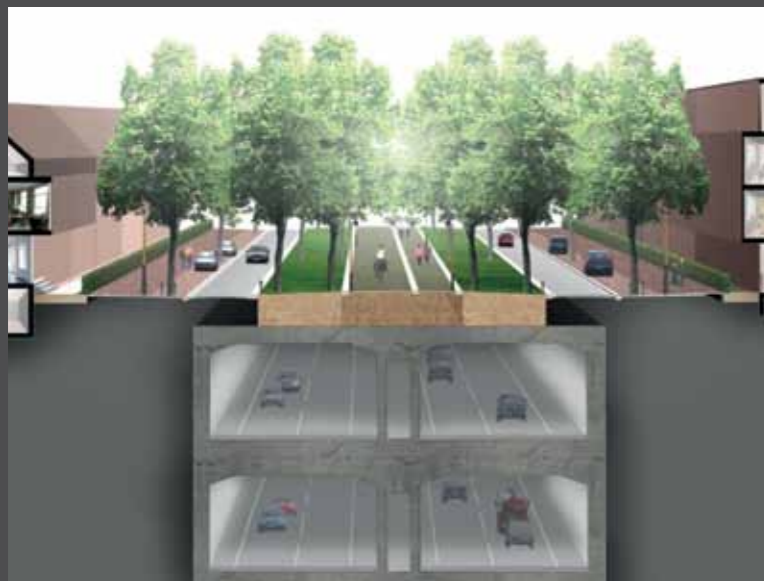
THE BIGGEST CONSTRUCTION PROJECT IN LIMBURG FOR COMING YEARS: THE GROENE LOPER (GREEN CARPET) FOR THE A2 IN MAASTRICHT

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Avenue2 (a combination of Strukton and Ballast Nedam) has been working on the Groene Loper plan in Maastricht since the end of 2011. A key part of this plan will be the stacked tunnel with its 108 slices due for construction over the next 3 years.

STACKED TUNNEL

The traffic will disappear some 2.3 km underground between Geusselt and Europaplein. The number of vehicles aboveground will drop by up to 80%. The tunnel will have four separate tubes, each with two lanes. The bottom two tubes will be for through traffic. The top two will be for local traffic. The separate tubes offer a number of advantages, including the safe and smooth flow of traffic, and more opportunities for maintenance and management. The tunnel will be constructed using tried and tested building techniques and will comply with a strict set of safety conditions. On top of the tunnel, there will be a route for slow and local traffic: the park avenue. The park avenue will be a long avenue of trees with a wide strip for bicycles and pedestrians.



SGS INTRON is supporting Avenue2 with hardening control in the Groene Loper project. The finite-element program HEAT from FEMMASSE will be used to calculate the temperatures and stresses in different sections. If necessary, rectification procedures (cooling plans) will be put in place.

Standard components will be determined for the concrete tunnel slices, and calculations made for every season so that, if necessary, a robust plan can be implemented to prevent temperature cracks. Here, account will be taken of the constraints and performance conditions set out in advance by Avenue2.

During the 1960s and 1970s, large numbers of homes were constructed in the Netherlands as part of the reconstruction after the Second World War. Now, 50 years later, many gallery flats from that time are in need of thorough renovation. Over the years, SGS INTRON has carried out many investigations into these kinds of flats, usually in response to visible damage such as cracks and flaking rust. Investigations have ranged from a quick scan aimed at pinpointing the risks to a wide-ranging damage investigation, including repair advice. SGS INTRON is also regularly commissioned to determine the general condition of a gallery flat. Especially after the news in May last year that part of a gallery of 1960s' flats had collapsed in Leeuwarden.

RISK ANALYSIS SEMINAR

SGS INTRON had for some time been thinking about sharing expertise in this domain and organising a seminar. "Almost every municipality has these kinds of flats in its area," explains consultant Mursel Sahin. "We noticed that in many cases, home builders, building and home inspectors, property managers and owners' associations asked the same questions. Regardless of what happened in Leeuwarden, there is a need to understand the state of post-war housing. What is my risk of an unsafe situation? How can I recognise the risks ahead of time and tackle any problems? Can periodic checks of the structure provide more certainty? These kinds of questions were the focus during the "Post-war gallery flats risk analysis" seminar we held on 25 and 27 January 2012 at our premises in Sittard and Culemborg."

FIVE STEPS TO A TRUSTWORTHY GALLERY FLAT

The 26 seminar participants included housing associations, councils and construction firms. They listened with interest to the three experienced SGS INTRON consultants, each of whom approached the subject from the point of view of their own expertise and perspective.

POSTWAR GALLERY FLATS: SAFE AFTER 50 YEARS?

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In his presentation "Five steps to a trustworthy galley flat" Martin Jonker explained how potential problems are identified via a risk analysis and how they can be handled. His colleague Maarten Swinkels explained what damage can occur and how this can be recognised. To conclude, Theodoor Gijsbers detailed the possibilities in the area of non-destructive testing: "SGS INTRON has a whole range of advanced techniques such as radar and eddy current tests designed to investigate concrete and reinforcement without damaging the structure. This is a strong point as - combined with minimal and highly selective destructive testing - we can reliably map the entire structure."

GABLES AND POURED CONCRETE FLOORS

The first photo that Martin de Jonker showed during his presentation was of the post-war gallery flat where he himself lived. In the 1980s, SGS INTRON investigated the attachment of the gable ends to the inside wall. "There are often problems with the gable ends," de Jonker says. As an SGS INTRON consultant, he has been involved in numerous projects dealing with post-war gallery flats. "If the wall ties rust - these connect the masonry outer cladding to the inside wall - the masonry can give away. Another possible problem is caused by poured concrete floors. In gallery flats from the 1960s, it was common for the first floor to continue on the outside as a balcony or gallery floor without having support brackets installed underneath. We currently have five projects where we're looking into just this kind of floor."

REPEATED DUE TO SUCCESS

Of course, there is not always something seriously wrong. But the fact is that the quality and safety of a structure cannot always be determined by eye. That's why SGS INTRON held the seminar to help owners and managers along the way. Because of its success, the seminar on post-war gallery floors was repeated on 4 April. SGS INTRON was also approached by one of the participants to organise the same kind of meeting for its own inspectors. The next step will be to organise a seminar later this year on the risks associated with parking stations. We'll keep you informed.



Gallery flat overview.



Brackets in which cracks were found during the visual inspection.



Serious reinforcing corrosion (initial chloride) found by destructive testing.

CREDITS

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