

**INVESTIGATION OF TAR IN  
ASPHALT ACCORDING  
TO CROW 210  
TIME FOR AN UPDATE?**

**CO<sub>2</sub> PERFORMANCE LADDER  
SGS INTRON CERTIFIES**

**ONCE ASBESTOS  
NOT ALWAYS ASBESTOS**

# SGSINTRON BULLETIN

**SGS**

The economy and particularly the construction world have been going through a very difficult period over the past three years. With the header 'Top builders earn less than half a cent on each euro', at the start of May, Cobouw reported that the profit margins of the largest Dutch construction companies had sunk to a very low level. On the one hand this is understandable - because of the reduced work flow the competition increases greatly and prices are squeezed, while some (indirect) necessary raw materials (including oil and metal) have sharply increased in price. On the other hand, many construction companies make little or no use of the possibility of increasing their margins by better risk management of their projects.

Every day SGS INTRON sees that, both during the design and the execution of construction projects, certain risks have been given no or insufficient attention, particularly as regards materials engineering. Although this provides us with a steady flow of work, we would prefer to see our knowledge and experience utilised in the design, preparation and execution phases of such projects. This not only reduces the project risks, it also increases the knowledge and experience of the people involved in the building industry in this field, so such risks are structurally lessened. From (inter)national studies it appears that in construction projects on average approx. 15% extra work (rework) must be done to remedy errors made. According to the researchers, utilising the necessary knowledge along with better communication between the parties involved beforehand can save 5% of the project costs!

Developments in the field of building materials are taking place at an ever-increasing pace. New raw materials, semi-manufactured and end products often arrive on the market with special, and therefore different properties compared to traditional building materials. If you are not aware of this, you run the risk that (the combination of) such materials will display unexpected behaviour in the completed construction with all the undesired consequences. On the other hand, these new building materials also offer opportunities. The contractor who best takes advantage of this knowledge to benefit the functional performance of the construction to be built cashes in. In both cases prominent knowledge and experience as regards building materials is essential. SGS INTRON would be pleased to help you here.

**GERT VAN DER WEGEN**



## PROFIT MARGINS OF CONSTRUCTION COMPANIES UNDER PRESSURE

**T**wee 'R' Recycling Groep, with establishments in Hengelo, Almelo, Veendam and Groningen, has been working in construction and demolition waste recycling since 1980: the collection, breaking, sieving, washing, windshifting and sale of recycling aggregates. Where new developments and quality are involved, the company likes to be out in front. They have been doing this right from the start in co-operation with (SGS) INTRON. An important project at present concerns the safe processing of waste containing bonded asbestos (asbestos mixed with cement and sand) – for example the familiar corrugated sheets – to produce new, useable construction products.

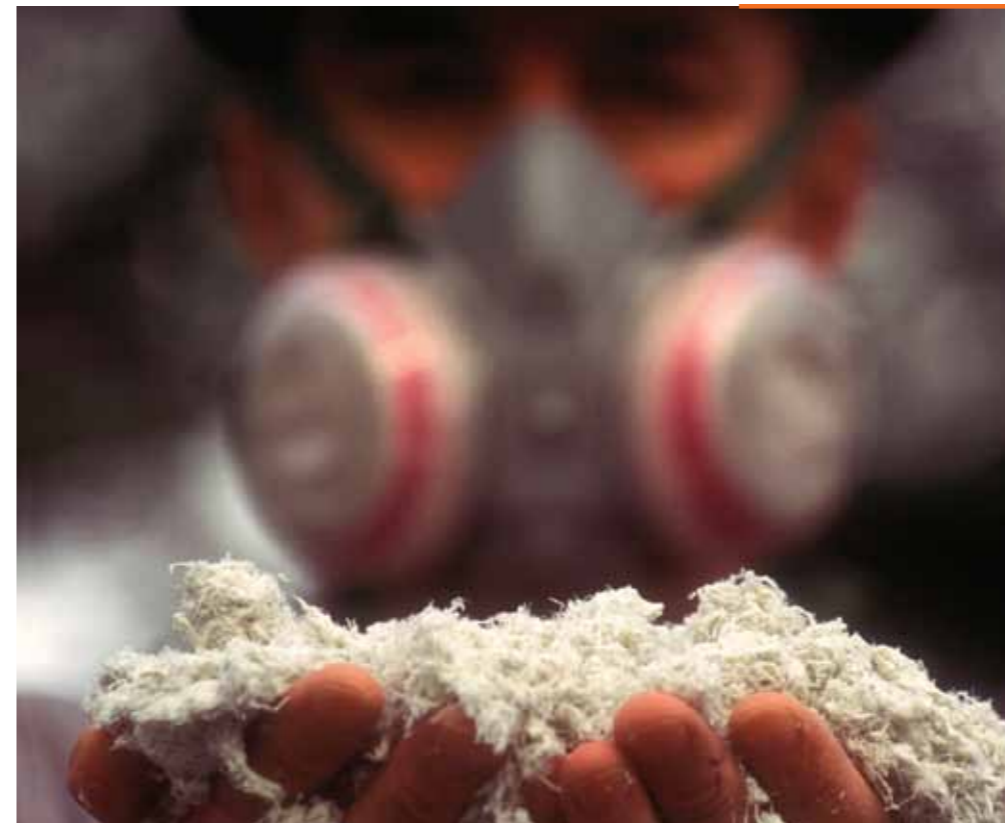
### ALWAYS UP-TO-DATE ON THE LATEST DEVELOPMENTS LARGE-SCALE APPROACH

If the management of Twee 'R' Recycling Groep has its way, in 2013 in Zwolle there will be a plant that can process 80,000 to 100,000 tons of waste containing bonded asbestos on an annual basis: on average the quantity emerging in the Netherlands in one year. "The financing is not yet in place, but the environmental impact assessment and construction plans are so advanced that we are nearly ready to apply for the licences", explains manager Jan Schuttenbeld. He is optimistic about the result. "Our technique is the first one to make carcinogenic asbestos harmless, and turn it into something that is safe and useable on a large scale."

### IRREVERSIBLE STRUCTURE CHANGE

Twee 'R' Recycling Groep has a European patent for the technique that is both advanced and extremely simple at the same time. "It is an existing technique, denaturation, that we have further developed and embedded in a total process", says manager Anton Reef. "Slowly heating the asbestos-containing material for a long time (80 to 100 hours) at a temperature of around a thousand degrees irreversibly changes the fibre structure.

# ONCE ASBESTOS, NOT ALWAYS ASBESTOS



You can compare it with making popcorn from maize. The harmful asbestos fibres have a hollow and needle-shaped structure. During the heating process in our plant the fibres 'explode' and a new, porous material with a completely different structure and properties originates: harmless and not carcinogenic. Because we are going to construct an expensive plant we want to have one hundred per cent certainty about this. This is also why we have asked SGS INTRON to assist us. The company is one of the few with the specialist equipment in-house that is needed to look deeply into the core of the material and indisputably establish that it no longer contains any asbestos fibres."

### IMPROVEMENT OF OUR OWN GRANULATE

Pilot projects have shown that the denaturation method developed is effective and safe. But Twee "R" Recycling Groep wants more than just the safe processing of the waste. Jan Schuttenbeld: "We want to fully recycle the material by making it into products of the highest possible quality. We are also putting our confidence in SGS INTRON for this. The company has a lot of knowledge that we would like to make use of. When we have ideas about product development, they understand what we are talking about and get down to work. For example, SGS INTRON investigated whether ground denatured material would have an added value as a filler in the aggregates that we make. That was indeed found to be the case. With the filler in the aggregates used as road foundations, a thinner foundation or asphalt layer can be used. This could offer attractive cost savings for road builders."

### SGS INTRON CERTIFICATE INSPIRES CONFIDENCE

Moreover, together with SGS INTRON, Twee 'R' Recycling Groep is investigating other applications and uses for the denatured asbestos. "Among other things we are looking at high quality applications in concrete, cement and asphalt", explains Anton Reef. "Acceptance of the product by the cement industry would be very nice. At the same time we realise that potential clients are initially wary when they hear that the product originates from asbestos. That's why we asked SGS INTRON to certify both the new material and the production process. SGS INTRON has a reputation in the construction world as being very reliable. If they – through a certificate – guarantee that our process and product are safe, we expect that future buyers will also have every confidence in them."



### RID OF ASBESTOS WASTE

SGS INTRON had already certified all the concrete, asphalt and aggregates mixtures from Twee "R" Recycling Groep. "It will be a challenge to be the first to be able to certify denatured asbestos", assumes Anton Reef. "Furthermore, it is obviously also a significant step forwards for us and for the environment. Up until 1993 approximately 7 million tons of asbestos cement had been produced in the Netherlands. Just over half of it lies in landfills, which will ultimately all have to be decontaminated. The rest is still in buildings or under the ground (sewer pipes). With all the material still to be released, the plant will certainly have enough work for another sixty years. We also want to start exporting this technique to other European countries. Now that SGS INTRON is a part of SGS, further cooperation over the borders is a logical next step."



# INVESTIGATION OF TAR IN ASPHALT ACCORDING TO CROW 210 TIME FOR AN UPDATE?

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CROW publication 210 acts on the crossroads of regulations, standards and quality requirements. Much experience has been gained since the implementation of this directive in 2007. But because it was only a directive without legal framework, compliance with it was optional. However, since the acceptance of the new National Assessment Guideline BRL 9320 for bituminous bonded mixtures in April 2009, the situation has changed. This Guideline requires the acceptance of released asphalt to be fully in accordance with CROW publication 210, giving the directive a foothold in the regulations. From then on compliance with the directive was no longer optional, and things were seen in a different light.



Since April this year a CROW working party has been working on evaluating publication 210 and assessing collected questions and comments to include in an adapted 210 publication. Representatives of the government, road builders, the recycling sector and laboratories including SGS INTRON are pooling their experience and taking part in this working party.

The principle of the method in publication 210 for determining the tarriness of an asphalt construction is the application of a 'multistage rocket'. This involves working from coarse to fine by first using the PAH detector to establish presumably tar-free asphalt layers from tarry layers, after which the tar-free layers are more closely investigated for the PAH level. To do this a DLC measurement can be used or HPLC or GCMS analyses, that compared with the DLC measurement are easily 10 times more sensitive in determining the PAH level in bituminous samples.

"A first important comment from SGS INTRON on the method in publication 210 is that the general PAH detector only has sensitivity to PAH in asphalt to approx. 250 mg/kg", says Klarenaar. From the evaluation of our laboratory results it appears however that under the correct processing conditions tar-free asphalt layers with a PAH (VROM) concentration < 75 mg/kg in an asphalt drilling core are shown with a reliability of > 95%. For this validation according to NEN-EN-ISO/IEC 17025 we used some 600 random measurements we have carried out over the past 4 years.



"With a critical assessment of publication 210, it appears that the protocol is generally very suitable, especially when you realise that this document of some 80 pages is a first initiative to arrive at a good process for the use of tarry asphalt in road construction" says Wil Klarenaar, Senior Consultant. When the directive 'must be fully complied with', however, this leaves little room for manoeuvre and rather gives it the status of a standard. However, CROW publication 210 in 2007 was not drawn up in such a way. Different rules apply for standards and directives. The core of the problem is that the investigation of the tarriness of an asphalt construction in the CROW publication is based on a very poorly performing DLC method. A number of times in the past year this situation has caused a lack of clarity, so that high quality well-conducted investigations of the tarriness of asphalt constructions were not accepted because the directive was not carried out in full.

Each PAH detector test was verified with an HPLC analysis. SGS INTRON therefore wants to propose that when the laboratory demonstrates to sufficiently master the method, the PAH detector results can be used to establish tar-free asphalt layers. Supplementary measurements with DLC add little to this, and can then be dropped. RvA (Dutch Accreditation Council) accreditation of the PAH detector test can support correct application.

However reliable it may be, the PAH detector remains an indicative test and cannot replace an analytical measurement. It is hence worthy of recommendation to verify the results of the indicative test with HPLC or GCMS. This is a second important comment on publication 210, being that the quantity of analyses to be conducted is only established based on the quantity of released asphalt, while taking no account of the technical quality of the available techniques. It is indeed desirable for analysis samples to be made up of different sub samples. The measurement result then applies to the mix sample of these sub samples. Mixing (too) many sub samples in an analysis sample increases the likelihood of missing a tarry asphalt layer because of the dilution of the sample. Using more sensitive measuring techniques makes the analysis result markedly more reliable, and more sub samples can be examined in a mix sample. As a result fewer analyses are required, so despite more expensive measuring techniques cost efficiency of the examinations is obtained with ultimately a better quality of the examination.

The SGS INTRON laboratory is accredited by the Dutch Accreditation Council (RvA) for GCMS analysis for determining the PAH level in bituminous samples according to NEN 7331. For all other activities for the prior examination in CROW publication 210 the validation activities are completed in the lab and the request for accreditation is sent.

## PURMEREND BUILDS FUTURE BRIDGE WITH KNOWLEDGE FROM SGS INTRON UNIQUE COOPERATION

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Purmerend local authority decided to build a bridge for pedestrians, cyclists and mopeds, called: "the Melkwegbrug", a design by "NEXT Architects". This bridge forms the new connection between "Weidevenne" and the Centre over the Noord-Hollandse canal. Pedestrians can choose the S-shaped part of the bridge, or the arch of steps that can also be used when the bridge is open. The cycling part is made of a fixed and a movable part so shipping remains possible.

### REALISATION

This project was taken on by Volker Staal en Funderingen BV (VSF) in Rotterdam. It involves the construction of a steel bridge including leading jetty (in the water) based on a so-called design and construct contract. The visible part of the bridge is fully built of steel, with a number of pre-fabricated parts brought to the construction site by ship. The steel parts were also already provided with a preservation system. The bridge is planned for completion at the end of 2012.

### UNIQUE COOPERATION WITH SGS INTRON

For Purmerend local authority this bridge will be an important sight in the town. Five years after the completion of the project the local authority also becomes contractually responsible for its maintenance. "The local authority therefore decided to bring SGS INTRON into the construction teams as a materials expert right from the design phase" says Jo van Montfort, Senior Consultant. "The primary role of SGS INTRON is to work on solutions, together with the local authority and all the parties involved, to limit the risk of premature failure as a result of corrosion. This is indeed a unique approach. Rarely is the knowledge and experience of SGS INTRON used in a preventive context. Purmerend is not only trend-setting here, it is also unique'. The contribution of SGS INTRON results in aspects such as the optimisation of the corrosion protection. Currently being looked at is the choice of preservation system for all parts of the bridge. There are critical examinations of combinations of materials, and of the risks that may arise for maintenance in the near and far future. SGS INTRON is currently establishing the quality requirements before a well-founded choice is made. There is a constant search for a good balance between quality and costs.

### INSPECTIONS AND SUPERVISION

In the coming weeks the work on location and at the VSF steel construction halls will start. During these activities SGS INTRON will amongst others make sure that NACE inspectors and concrete maintenance experts are present on location, to check whether the work is conducted according to the currently agreed quality requirements, and in line with an acceptable maintenance budget.



# THE POWER OF THE COLD LAYER: EMULSION ASPHALT CONCRETE

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Emulsion Asphalt Concrete, EAC for short, has already been used in road construction for decades. The product is suitable for the repair, filling and stiffening of the road surface, for noise reduction and for the coloured marking of road parts such as cycle lanes and pedestrian areas. It is a fast and relatively inexpensive solution with which general overhauls can easily be put off for five years. SGS INTRON supports producers of EAC with advice and research. On the basis of an indicative life cycle analysis we have shown that for all environmental aspects EAC scores significantly better than thin hot top layers (traditional asphalt). This is for reasons including low material use (thin layer) and savings on energy by cold application. For parties such as the Directorate-General for Public Works and Water Management and local authorities who look for sustainable purchases this is all the more reason to use EAC.

## NOT FOR ANY ROAD SURFACE

SGS INTRON advisor Martin Verweij has much experience with the product: "I have worked at a supplier of bitumen emulsions. As a result I know the production process and I know what is important for good application. EAC is a cold mixture of mineral aggregate (broken stone, crushed sand and dust), modified bitumen emulsion, cement and water. It is prepared and applied in a continuous mixing process on the road with one and the same machine. Factors such as the weather – not too cold or humid – and the condition of the road surface largely determine the end result and durability. EAC is, for example, unsuitable for sealing large cracks or repairing serious rutting. Knowledge is required to be able to assess if a surface is suitable. SGS INTRON can advise customers in this respect."

## CE MARK

In the recent period SGS INTRON has investigated the processes and products of the three Dutch EAC producers as a part of the route towards obtaining the CE mark. SGS INTRON Certification has as a notified body issued the FPC certificates for the EAC products. "To be able to bear the CE mark, from this year onwards products must comply with the European standard NEN-EN 12273", explains Martin Verweij. With his expertise he is asked by producers to inspect and assess (Initial Type Testing) their trial sections (100 metres of road surface with EAC). "This takes place immediately after application and one year later. We have examined and checked samples we have taken against the standard in our laboratory. We have also examined the processes, from raw material purchasing to the application of the EAC. We don't just check the paperwork, but also make sure that the system actually performs in practice. Based on the results the products are classified and provided with the CE mark by the producer."

A comparable process is currently taking place for the CE marking of surface treatment for hardened surfaces (wear coatings) according to NEN-EN 12271.



## SUSTAINABLE

Holcim Concrete products BV frequently makes use of recycled materials, and sought a way to have the exact use of secondary materials confirmed for use in external communication.

Holcim uses a raw materials consumption system that, for each production location and machine, monitors the raw material consumption with a known accuracy. On the basis of definitions in ISO 14021, SGS INTRON Certification verified the reliability of the system.

The SGS INTRON declaration is included in the Holcim Sustainability Report, see [www.holcim.nl/uploads/global/CSR\\_Report\\_2011/index.html#/16/](http://www.holcim.nl/uploads/global/CSR_Report_2011/index.html#/16/)

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# GETTING ACQUAINTED WITH THE NEW CO<sub>2</sub>-PERFORMANCE LADDER



MORE INFORMATION ABOUT THE SEMINAR CAN BE FOUND AT [WWW.SKAO.NL](http://WWW.SKAO.NL)

The CO<sub>2</sub> performance ladder is a tool in the tender process. Contracting authorities use it to identify and reward companies who take CO<sub>2</sub>-reduction seriously. ProRail offers a tender advantage to certified companies.

Certification on the CO<sub>2</sub> performance ladder is possible for companies that have a good understanding of their energy consumption and communicate about it. A first step is the drawing up of a so-called CO<sub>2</sub> emissions inventory. In addition, companies must establish objectives for the reduction of CO<sub>2</sub> and participate in chain initiatives. By now, many companies in rail construction have become certified, and other sectors are following.

In order to increase knowledge of this tool, the new administrator of the CO<sub>2</sub> performance ladder, the "Stichting Klimaatvriendelijk Aanbesteden & Ondernemen" has, in co-operation with ProRail and the Directorate-

General for Public Works and Water Management, developed the CO<sub>2</sub> performance ladder seminar. On 31 May and 27 June in Amsterdam a seminar was organised for familiarisation with the new CO<sub>2</sub> performance ladder. SGS INTRON Certification certifies companies according to this CO<sub>2</sub> performance ladder.

If you would like to know more about ladder certification contact Erik Hoven, [erik.hoven@sgs.com](mailto:erik.hoven@sgs.com), T 0345-580 733.

If you are interested in having your emissions inventory verified you can contact Martine Meerburg, [martine.meerburg@sgs.com](mailto:martine.meerburg@sgs.com)





# IMPRESSIVE SPILLWAY INSPECTION IN TROPICAL CAMEROON

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In January SGS INTRON advisor Robert Haverkort and his colleague Bas Bruijns Slot travelled to Cameroon to inspect a spillway on the Sanaga River at Edéa. The lock controls the water supply to the AES-Sonel hydroelectric power station further along the river. In wet summer months (the rainy season) surplus water must be diverted away. Shortly after construction, cracks originated in the lock concrete. SGS INTRON investigated the cause and gave advice on (the necessity to) repair.

## THOROUGH PRIOR EXAMINATION

"We were called in by the Belgian contractor Besix with whom we have worked a number of times", says Robert Haverkort. "They built the spillway. Because we are SGS, energy multinational AES immediately had confidence in us as an independent party. We carried out a thorough investigation: they wanted certainty. Prior to the inspection we investigated all the raw materials and assessed the cement composition. We investigated samples sent for microstructure and compression strength. The construction drawings and the accurate recording of quality information at Besix such as concrete temperatures and pouring orders were also checked by us for non-compliances that may cause the cracks. We also used finite elements analyses to see if the problems could have been anticipated."



## WAITING TILL AFTER THE RAINY SEASON

The inspection took place when the water level in the river had fallen sufficiently. Based on a provisional hypothesis SGS INTRON worked very specifically. "Besix had documented the location and dimensions of the cracks well. We verified this information and extended it with our own, new observations. We also had extra cores drilled and investigated. At the end of a full working week we could present a clear conclusion: there is no constructional problem. The cracks in the spillway originated due to the generation of heat in the thick concrete slabs after pouring. If such a slab is jammed in, high stresses are obtained with cooling. Besix had reinforced on top. Cracks are then to be expected, but in this case they were a little larger than allowed. In the meantime we approved the repair proposal from Besix. The customer is very satisfied. Both with Besix and with us. We can look back on a successful project. And not in the least because of the impressive location."



# RESTORATION OF WORKERS' HOMES SNOUCK VAN LOOSEN PARK ENKHUIZEN

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SGS INTRON is presently carrying out an interesting project in the old inner city of EnkhuiZEN. Here the Snouck van Loosenpark is a familiar and well-liked place. It is a leafy park with beautiful old trees and 50 authentic workers' homes built around 1897 to a design by the architects Christiaan Posthumus Meyjes Sr. (homes) and Hendrik Copijn (landscape). These homes have been very popular among tenants right up to this day. Several problems emerged on the occasion of the last maintenance, however. The most important were the façade brickwork cracking and flaking off and wood rot in the outside casing. The homes inside are also often too damp, with comfort being affected. This was reason enough for the owner of the complex to ask SGS INTRON for advice on the correct approach. After all, these homes must also be saved for coming generations!

## CONCRETE FOR CONCRETE GROUNDWATER IN THE OUTER WALL

An extensive investigation revealed, among other things, that the park originally formed part of the port of EnkhuiZEN. The groundwater level under the houses is in some places too high, so damp is drawn up into the façades through the brickwork foundations. The homes were thoroughly renovated in the eighties. Then the old lime-bonded pointing was replaced by cement-bonded pointing. Wall facings were also built on the inside against the façade. These changes, in combination with the high groundwater level, affected the damp in the façades: in many



cases they no longer fully dried out. Some of the weaker pointing was loosened by damp and frost. Frost damage also originated in the surface of the bricks. As a result of the damp in the façades, the wooden casing has also become damp, so maintenance costs are high. And, even more seriously, rust has originated in the steel beam and frame anchors in the façade brickwork. The anchors are often so rusty that serious cracks have appeared in the façades. In short: a thorough approach is required.

## MEASURES FOR NOW AND FOR THE FUTURE

That is also what SGS INTRON recommends. Adviser Fred Winkel: "In our advice we made a distinction between repair measures and measures to improve the situation in the future. The repair measures directly concerned damage such as the removal of rusted anchors and the repair of the façade brickwork and pointing. Measures to improve the situation in the future are aimed at less damp in the façade brickwork. In real terms this means the lowering of the moisture absorption in the façade surface, the improvement of the physical construction of the façades and the reduction of rising groundwater."

## FACELIFT FOR THE SUMMER HOLIDAYS

The following measures were taken on the advice of and under the supervision of SGS INTRON:

- Full replacement of the lime-bonded pointing in the façade: carving work because of the monumental character of the homes.
- Water-repellent treatment of the façades.
- At a later stage the inside of the insulated façades is to be further provided with a damp-retarding layer.
- Rising damp is prevented by lowering the groundwater level around the homes. A drainage system was provided for this in co-operation with EnkhuiZEN local authority.

To respect the monumental character of the houses, it was also decided to restore the lead curls above the façade framing in old lustre and again fit zinc drainpipes. If everything goes as it should the whole park will be looking its best again before the summer holidays.



# FIFA RECOGNISES SGS INTRON AS A FULL PLAYER

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Besides the national sporting body NOC\*NSF, the international FIFA (football) and IRB (rugby) associations have now also recognised SGS INTRON Certification". We are now entitled to call ourselves a fully-fledged player in the sports inspection market. In the Netherlands we offer a complete range of services – advice, research and certification – for all constructional sports floors. And now, from December 2010 onwards, the worldwide testing and certification of football and rugby fields are added on top.

## STRICT STANDARDS FOR STAR PERFORMANCES

Peter Verhoeven is one of the three FIFA-accredited inspectors at SGS INTRON: "Before we only approved the substructure. Now we can inspect an artificial turf surface from A to Z and carry out the final inspection. We also investigate materials such as artificial turf, infill sand and infill rubber in our own laboratory. There we also have all the equipment for the testing of technical sporting properties and durability. The FIFA standards are very strict, there is very little room for manoeuvre. Only if a field fully suffices does FIFA – depending on performance – issue the FIFA 1-Star or FIFA 2-Star certificate."

## THE STANDARD WORLDWIDE

FIFA accreditation gives access to a large, new market: artificial pitches worldwide must suffice with regard to the FIFA standards. Major international competitions such as the UEFA Cup and Champions League may, for example, only be played on artificial pitches with a FIFA 2-Star certificate.

The FIFA standards also play an important part in our own country: in 2010 the Dutch FA was one of the first national football associations to fully switch over. Each newly laid artificial turf surface must be tested and approved by a FIFA-certified institute before use. In the Netherlands alone that amounted to 230 new football pitches last year!

## THE NEXT STEP: FIFA-APPROVED LABORATORY

At the same time SGS INTRON is again working on the next step: obtaining FIFA-accreditation for the laboratory. "Separate accreditation is required to be able to test new sports constructions and materials for use outside", explains Peter Verhoeven. "Hopefully we will soon be one of the few parties able to give the rubber stamp there."



# FLEVOBOYS PLAY ON FIRST FIELD WITH GUARANTEED FIFA 2-STAR PERFORMANCE

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The new FlevoBoys football pitch is the first in the Netherlands with an insured performance guarantee. Insurer Allianz guarantees a FIFA 2-star performance for five years, providing the Emmeloord club uses and maintains the field in the correct way. This is monitored by cameras that register the movements and hours of play 24 hours a day, obviously while respecting the rules for the protection of the privacy. The guarantee is issued (partly) based on the confidence that SGS INTRON has declared in the parties responsible for the design, production, construction and maintenance.

## APPROVAL FOR EVERY LINK IN THE CHAIN

SGS INTRON obviously did not express this trust without very good reason. An extensive chain management system lies at the basis of the insured performance guarantee for artificial turf sports facilities. This was developed by SGS INTRON in co-operation with synthetic turf producer Ten Cate

Thiolon. All important stakeholders from the field were involved. Peter Kosterman from SGS INTRON: "For each link in the sports construction chain - designers of sporting projects, producers of sports floors/materials, builders and maintenance contractors - we drew up a separate SGS INTRON accreditation regulation: the SP01 to SP04 regulations. We check the work of the parties involved on the basis of these regulations."

## LASTING QUALITY

All parties involved with the FlevoBoys football pitch were assessed on the basis of the accreditation rule applicable to their link in the sports construction chain. Peter Kosterman: "They amply met the requirements, and were therefore certified by us. This certification is a condition to be part

of the insured performance guarantee project. If you wish to be on the starting blocks for such a project you must be able to demonstrate that your products or processes suffice with regard to the requirements in the applicable accreditation regulation." Each designer, producer, constructor or maintenance contractor may, in principle, be a part. The system is not intended for one type of field system or reserved for certain parties. SGS INTRON considers wide availability essential for acceptance of the chain management system on the market. "We already see that this is arousing much interest. Whether or not you are going to participate in a guarantee project, certification according to the new, widely accepted accreditation regulations is in any case proof that you deliver quality."

# SGS INTRON BV ACHIEVES ACCREDITATION FOR THE TESTING/ INVESTIGATION OF PRODUCTS APPLIED ON ROOFS AND FAÇADES

On 20 May the Dutch Accreditation Council accredited SGS INTRON BV as a body which conforms with ISO/IEC 17025, also when testing roofing and façade products. This is the highest quality standard whereby a test and research laboratory can comply. The most common tests on roofing and thermal insulation are assessed in conformity with the prevailing European standards. The expansion

of the scope can be seen on the RVA site under registration number L017.

The accredited package is part of some 100 tests conducted to investigate the physical/mechanical properties of roofing, thermal insulation and foils.

In recent years SGS INTRON has invested substantially in expanding its testing facilities for roofing and façade



products. Thanks to the investments, together with the Certification department we can now offer our clients from the roofing and façade sector a yet more efficient and better service.



# SERVICE LIFE HYDRAULIC ENGINEERING WORKS PREDICTABLE RELIABILITY

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Armour stones are used in hydraulic engineering constructions such as breakwaters and piers, but also in dike construction, sea walls and shore revetment. They are processed natural, artificial or recycled materials or mixtures of them. They are characterised by an even, craggy structure: important for the stability of the hydraulic engineering works. A requirement of at least a hundred years' service life is usual for these types of constructions. The question is: how can the intended service life already be demonstrated before construction? The European NEN EN 13383 standard describes different tests for this. This is familiar ground for the staff at the SGS INTRON laboratory. "We are involved in various projects in hydraulic engineering", says advisor Martin de Jonker. "Every project requires its own approach. Which tests from the standard are relevant depends on the type of stone, the application and associated load. By carrying out the right tests we can make a very reliable prediction of the life of armour stones and hydraulic engineering constructions."



## GREAT VARIATION IN SORTING

Armour stones come in all kinds and sizes. NEN EN 13383-1 "Armour stone – Specification" distinguishes three types:

- Coarse grading: nominal upper limit of 125–250 mm, such as sorting 45/125, 63/180, 90/250. 45/180 and 90/180 mm.
- Light grading: nominal upper limit of 25–500 kg, such as sorting 5/40, 10/60, 40/200, 60/300 and 15/300 kg.
- Heavy grading: nominal upper limit of over 500 kg, such as sorting 300/1000, 1000/3000, 3000/6000, 6000/10000 and 10000/15000 kg.

## STANDARDS AND DIRECTIVES: THE BASIS FOR TESTING

How to test if armour stones satisfy the requirements is set out in NEN EN 13383-2 "Armour stone Test methods". For armour stones destined for Dutch hydraulic engineering works there are also performance classes applicable in NEN 5180 "Dutch supplement to NEN-EN 13383-1".

Certain armour stones for Dutch hydraulic engineering can be supplied under BRL 9312 KOMO® product certificate (in conformity with the Soil Quality Decree) with CE mark. These are armour stones of natural origin used as non-shaped building material or as shaped building material in unbonded applications in earthwork, road building and hydraulic engineering. The assessment guideline (BRL) makes requirements of the extraction, processing, sorting and transport to the buyer in relation to the environmental protection requirements (emission/leaching) from the Soil Quality Decree. Performance or application requirements are not included in the BRL, neither are tests concerning the life of the armour stones.

## TESTING THE WORKING LIFE

NEN-EN 13383-1 does describe different tests for the demonstration of the life of armour stone. The tests concern the following properties:

- Resistance of blast furnace slag and steel slag (for stones in which this is processed).

- Water absorption (check test for resistance to freeze-thaw resistance and salt crystallisation).
- Resistance to freeze-thaw resistance (depending on whether below or above seawater level).
- Resistance to salt crystallization.
- Sonnenbrand (for volcanic rock such as some kinds of basalt).

Not all these tests are relevant to each type of armour stone. Which tests are relevant must therefore be checked per application.

## DURABLE = RETENTION OF PHYSICAL PROPERTIES

It can be generally said that armour stones are durable if they retain their physical properties in the stages of construction and use, they do not crack, and no changes occur to the surface.

Hence NEN-EN 13383 also sets out physical and chemical requirements and tests for armour stones. The physical requirements concern:

- The density of the stones.
- The resistance to cracking according to annex A of NEN-EN 1926 "Natural stone – Determining the compression strength". Armour stones may not display significant cracks that could cause breakage during loading, unloading or application. These cracks could cause the following:
  - during the construction phase cracked parts can break off so the weight and integrity of the stone decreases.
  - loads occurring in use can change the civil engineering performance (including rate of compaction) of the construction.
- Resistance against wear according to NEN-EN 1097-1: "Determining the resistance to wear (micro-Deval)", of NEN-EN1097-2: "Determining the resistance to crushing (LA test)". These tests are unsuitable for heavy grading armour stones.

Chemical requirements in the standard concern the absence of impurities and components soluble in water.



Photo above: armour stone with coarse grading. Photo below: armour stone with heavy grading.

## TESTING WITH AN EYE FOR STONE AND APPLICATION

For these tests it must also be determined for each situation if they are relevant. Whether the tests provide relevant information about the life of the stone depends on the type of armour stone. It is also obviously important to analyse the chemical loads to which a construction is to be exposed. In certain situations these too can comprise a threat to the durability of the stones. Martin de Jonker: "Our experience is that the origination of cracks in armour stones often causes the main durability risks. This is why as a supplement to NEN-EN 13383 we often recommend the "point load strength" test (The Rock Manual, CIRIA C683 – ISRM -1985). In the Netherlands armour stones are not yet often investigated for durability. But the possibilities are indeed there. With professional testing, good service life prediction for hydraulic engineering constructions is in our opinion certainly possible."



## SENIOR CONSULTANT ROBERT HAVERKORT: “I ENJOY BEING CHALLENGED BY COMPLEX PROBLEMS”

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### YOUR RELATIONSHIP WITH SGS INTRON CAN BE CALLED SPECIAL. CAN YOU EXPLAIN WHY YOU ARE STILL DOING YOUR JOB AT SGS INTRON AFTER FIFTEEN YEARS?

“I already liked the company before I started work at SGS INTRON. Particularly because to me the company has always seemed to be, and still is at the top level. I look for challenges in my work that I find in complex problems. The style of SGS INTRON also closely matches the person I am and the way I want to work. There is no pigeonhole mentality. You are given the freedom to find your own way. If you want to move into a new field, you do this together with colleagues already expert in that area. There are many people willing to share their knowledge and experience. We help each other where necessary. That is special, it is our power. As a result we can also take on large projects with sufficient challenges remaining for us.”

### IN THE MEANTIME YOU HAVE BECOME ONE OF THE MOST EXPERIENCED ADVISERS. HOW DID YOUR CAREER IN CONSTRUCTION START?

“After my geology studies – with informatics as the subsidiary subject – I came across engineering office Decker through a number of contacts. My first project concerned the stabilising of sewer sludges using materials such as calcium, cement and fly ash. I was immediately given plenty of freedom and appeared to handle it well. Because of my geological background I was then given a project at a large sand-lime brick plant in Harderwijk. They wanted to inventory the sand stocks in Lake Veluwe and its contamination. I had no experience with boreholes but sufficient background knowledge to take the project on. In the end they were so pleased with me that they asked me if I would like to start working for them.”

### IN WHAT JOB AND DOING WHAT WORK?

“I started as Head of R&D. My most important task was guiding the development of a pilot plant (sandlime brick/fly ash line) and setting up experiments for this. After six months I became head of the laboratory responsible for production control. I was occupied with experiments, but beyond that as a troubleshooter at the factory, I also dealt with various technical and IT problems. I developed a model to be able to predict the quality of sandlime brick on the basis of the raw materials used. It appeared to be a good tool, and still is now. I was also working on the start-up of a corrugated sheet plant on the site. That was my first acquaintance with cement-bonded materials. I also set up quality systems for the plant such as ISO 9001. When I was working on the start-up of two factories in East Germany an interesting position became vacant at SGS INTRON.”



### WHICH CHALLENGE MADE YOU JOIN SGS INTRON?

They were looking for a head of a materials engineering laboratory. In this position I have also gained experience with all sorts of materials. In 1999 I made the transition to Consultancy. I have completed projects in numerous fields: sealing landfills, sewer pipes, road foundations, concrete, damage, mix design, durability and even wood. Every time, this concerns a problem for which you conceive a structure in consultation with the customer. The way of thinking is the most important. The attitude too: if there are problems, you are going to solve them.”

### DO YOU WORK ON OTHER PROJECTS NOW THAT YOU HAVE MORE EXPERIENCE?

“Yes, I am now called in more often as a consultant for risk assessments. I performed such work for EON, for example, with the construction of the power plant on Maasvlakte 2. I was asked to offer requested and unrequested advice to ensure the proper construction of the critical concrete components. Five years ago I also specialised in the Femmasse finite elements software. With it we can predict the behaviour of young concrete in practice. The last year and a half I have mainly been working on business development abroad. This has everything to do with our joining SGS and our ambition to grow worldwide.”

### HOW DO YOU HELP GIVE SHAPE TO THOSE INTERNATIONAL AMBITIONS?

There are two areas of expertise that we want to export: sustainability (the environment, waste and energy) and durability (everything aimed at the

longest possible lifespan for concrete constructions). I am particularly occupied with the latter. I’ve just returned from Cameroon, and as a consultant I have also been involved in projects in Oman, Qatar, Turkey, the US and Ireland. These are often large construction projects with international teams. They are really enjoyable to work in! We are usually called in within the context of risk management. We try to reduce the risks pertaining to concrete by, for example, looking at the concrete formulation, the method of pouring, the type of construction and environmental factors such as aggressive environments that can be of influence on the working life. Tools we use here, such as microscopy and concrete tests, are to the extent possible handed over to local SGS staff. SGS INTRON is due for international growth. We have the standing, the knowledge and the experience. But this is not something you do alone. There are more people, like me, with great enthusiasm. Only together can we give shape to these ambitions.”

## CREDITS

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## SGS INTRON INTRODUCES

**ON 1 OCTOBER 2010 BRAM HENDRIKS WAS RECRUITED BY SGS INTRON BV AS A LABORATORY ASSISTANT AT THE SITTARD ESTABLISHMENT.** Bram Hendriks followed civil engineering at the TU in Delft, and for his Master's he specialised in building physics and sustainable building. In 2010 he completed his studies on the subject 'optimisation of solar power consumption for homes'. By order of an engineering office in Maastricht he then investigated the influence of domestic behaviour on the configuration of a solar power system. During his studies he also gained experience at a building physics consultancy where he worked on energy performance calculations, daylight simulations, sound abatement of façade constructions and ventilation calculations. At SGS INTRON B.V. Bram wants to mainly concentrate on building physics-related issues arriving at the laboratory. In addition, to widen his technical laboratory materials science knowledge he will in the first instance also become involved in projects outside these fields.



**STEFANIA ROSSO STARTED WORK AT SGS INTRON IN FEBRUARY 2011 AS A SENIOR ADVISOR IN THE BUSINESS DEVELOPMENT TEAM IN SITTARD.** Stefania comes from Italy, where she completed university environmental studies and has also carried out research work. Afterwards she pursued a doctorate in Great Britain with research into the environmental impact in the whole life cycle of home improvement activities. Stefania has worked in Great Britain as a sustainability manager for the British cement industry and for the CEMBUREAU in Brussels. She was manager of the sustainability programme of the British cement industry, and involved with the implementation of the EU and UK sustainability action plan. In so doing she gained much experience in making information about the durability of products and processes objective. At SGS INTRON Stefania is working on expansion in Europe and worldwide of the activities of SGS INTRON in the field of sustainability (LCA, EPD, waste management). For this she is building on the many years of experience of SGS INTRON in these areas.



**HUUB DE VRIND STARTED WORKING FOR SGS INTRON ON 14 MARCH 2011.** In Huub, SGS INTRON has recruited someone with what may be termed a somewhat unusual CV. After biology studies in Utrecht he worked for a period as a scientist, including training to become a radiation expert, level 3. After radiation hygiene the step to industrial hygiene was no longer a big one. Then the step to safety expert was also a small, and maybe very logical one. Working as an advisor, amongst others at the Army health, safety and welfare service, Huub has looked at the work processes at many and diverse companies such as construction and metalworking companies and hospitals. There he has also observed that safety can and must be improved at many companies. By starting work as an SCC auditor, Huub also hopes to contribute to the improvement of safety. He successfully completed the DLP training last year, and the DTA training several years ago. Hence he is also interested in soil remediation and asbestos removal, and who knows, Huub may also be of service to SGS INTRON in those fields.



**PETER VERHOEVEN STARTED WORKING AT SGS INTRON ON 10 JANUARY IN THE POSITION OF SENIOR INSPECTOR FOR SPORT,** a job he had already had at another inspection body for eight years. In that time Peter had inspected sports centres both at home and abroad. In 2007 Peter went to China to approve sports accommodation. This was while construction was fully under way for the Olympic 2008 Games - an intense experience. Peter has always looked for new challenges and experiences. He then worked as a national quality coordinator at a sports contractor for three years: the support and guidance of laying teams when constructing sports fields. He also advised project managers and customers. You could also say it the other way around: first test then construct, but remember that you then approach and analyse matters in a very different way. It was always exciting to deliver quality for the lowest possible cost. The ultimate objective is safe sports accommodation, in particular for the user. And that is what it is all about at SGS INTRON: inspecting the sports accommodation, and on the basis of measurements determining whether the sports accommodation meets the requirements of the NOC\*NSF and the regulations of the sports associations. Integrity is very important to Peter. Peter is of the opinion that he can share his experience well in the SGS INTRON organisation. Guidance in the case of alternate constructions, support for inspectors and the structuring of the activities around sports are also among his tasks.



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WHEN YOU NEED TO BE SURE

