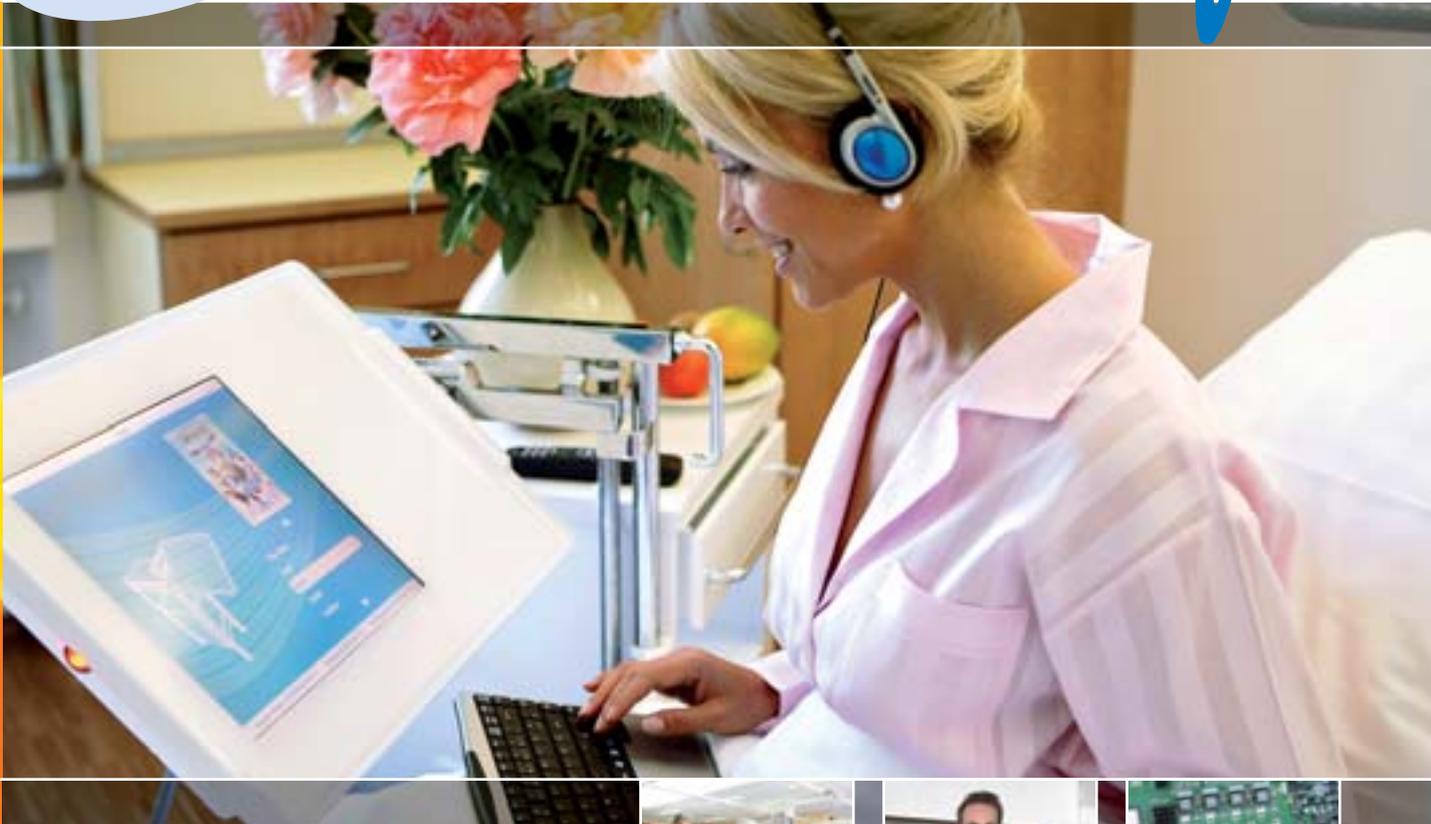




# WAY of life



edition  
**27**  
May 2009





## our EMS trade and the recession

house and other loans, about money lost at the stock market. On a daily basis the media are dishing up bleak news items. The good news gets very little attention.

And yet, our trade has gone through a lot already. Globalization: the disappearance of work to the Far East and Eastern Europe. Having our daily worries, we would almost forget that since 1990 over 70% of our industry has been moved from the Benelux. The remaining companies are the gems; they are the companies that invested in knowhow and technology. This recession however, has an extra handicap: the financial support of the banks. So, our sector organisations will have to stand up for us: demand attention from our government(s) and make it clear that giving priority to our own industries is (more than) necessary. Dare as the French dare.

And let's keep our eyes wide open: look there are going to be some displacements. Worldwide work will be divided differently: continent after continent; work from the Far East will be returning; orders will turn into short term orders; more attention for cash and low stocks; long transport times will have to be reduced (eight weeks on board is too long 'sleeping capital').

Clients want to talk to local suppliers again: they will be asking for cooperation in the development stage, co-engineering, direct and short lines with the project management and a full supply chain service.

In his *tbp* visie n° 26 column Ton writes

about the necessity of the ultimate cooperation. This is now preferable in all fields: authorities, trade organisations, business life and employees. Having an unprecedented determination to deal with the challenges together.

Let's polish our gems. In our factory in Geel we have the program *tois* (*tbp's* operating improvement system): improvements without effort. And they are having results! Now we have to our best - in consultation with our suppliers and clients - to cooperate enthusiastically without effort, purposefully and professionally. The recession, knocking at our door, will not be allowed in.

And as vitamin C for success: make it a beautiful day each and every time!

Anton

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**Tbp electronics Belgium is shortlisted for the prize "enterprise 2009" by VOKA Kempen (Chamber of Commerce). Tbp is one of three laureates. The winner will be announced on 15 May. More information: [www.voka.be/kempen/nieuws](http://www.voka.be/kempen/nieuws). .**

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## colophon

### postal address

tbp electronics bv  
postbus 8  
3247 ZG Dirksland  
T +31 (0)187 602744  
F +31 (0)187 603497  
E [info@tbp.nl](mailto:info@tbp.nl)  
I [www.tbp.eu](http://www.tbp.eu)

### visiting addresses

Vlakhodem 10 • 3247 CP Dirksland (NL)  
Bell Telephonenlaan 3 • B-2440 Geel (B)

### editing

Dana Wolters ([info@tbp.nl](mailto:info@tbp.nl))

### photographs

Arjo van der Graaff fotografie  
**Copywriting & photography**  
redactie in techniek, Frans Witkamp

### design

Peter Walschots & Grafisch Bedrijf Hontelé

### printer

Grafisch Bedrijf Hontelé

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# visit Electronics & Automation

*At the trade fair Electronics & Automation (27-29 May, Jaarbeurs Utrecht) 125 companies will enlighten the visitors on the developments in the field of electronics. You will find there a lot: electronics developers, producers, production equipment, testing and measuring equipment and components (manufacturers and importers). It goes almost without saying that tbp electronics will be present with a large stand (8B019) in order to welcome you and to see you in an appropriate environment. In our Grand Café our people will listen to your wishes and will fill you in about the developments within our company.*

## gadget

To make your visit worthwhile, electronics with which you can assemble yourself a wireless sensor temperature meter will be produced in the Live PIL (Production Integration Line: a sort of mini-factory). This temperature meter is the gadget that the fair visitor can lay hands upon if he or she applies for it. If you want to get hold of this gadget you have to register as a visitor of the fair and subsequently apply for the gadget. This can be done via tbp's website ([www.tbp.eu](http://www.tbp.eu)). You want to do this quickly, as the available number of gadgets is only 2,000. In order to assemble the gadget you have to visit eight different stands. You gather there the printed circuit boards, casing, foil, battery and software that make up together a digital temperature meter. Extra attention will be paid to the ESD-proof (Electro Static Discharge) packaging, so that your product will not be damaged

by static discharges. You will be able to have the firmware activated in tbp's Grand Café. Then you check whether the electronics are functioning well and you can calibrate your gadget. If you have gone through all stages, then you have a sensor that transmits the actual temperature wireless to a dongle in your pc. The software on the pc presents the measured value on screen. The gadget has been realized thanks to the cooperation of various sponsors. One company made the design, about 16 others supplied the various parts, 13 companies made equipment available for the Live PIL, 12 companies supplied testing and measuring facilities and the software and last but not least 7 companies – amongst them tbp electronics- supplied the necessary financial and supporting means. You can read more on the assembling of the Live PIL on page 6 of this newsletter.

## lectures

Six seminars are organized in the conference rooms at the trade fair floor. Quality from the perspective of the visitor and/or user has been highlighted while determining on the programs. Both the message per seminar and the

lecturers and their presentations have been tuned in this respect with a group of companies involved. For more information about the seminars, please contact Paul Petersen ([p.petersen@fhi.nl](mailto:p.petersen@fhi.nl)) or Linda Dekker ([l.dekker@fhi.nl](mailto:l.dekker@fhi.nl)) of FHI, Federation of Technology Branches, telephone +31 (0) 33 465 75 07. Don't miss out on "High Tech Heels": here you meet a number of female tbp employees ... because various women do play an unavoidable part in the EMS-trade!

Tip: note in your diary/organizer:

**Wednesday 27 May around 16.00 hours  
 happy hour at tbp electronics,  
 Grand Café, stand 8B019!**



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## summer closure

*During this summer the companies at the locations Dirksland and Geel will be closed during the holidays. For Geel these will be weeks 29 and 30 (Monday 13 up to and including Friday 24 July) and for Dirksland these will be this year two weeks: week 32 and 33 (Monday 3 up to and including Friday 14 August). To have your own production continued unhindered, it is necessary to have our supplies to you tuned with our contact person in time. Give us your forecast(s) and order(s) well beforehand, and then we can make sure that you will get your products according to your appointment. The same goes for quotations: ask for them on time!*

*You may contact Mrs. Annemieke ten Broek ([atbroek@tbp.nl](mailto:atbroek@tbp.nl)) of our department order processing for Dirksland and for Geel you may contact Mr. Ir. Frans Geerts ([fgeerts@tbp.eu](mailto:fgeerts@tbp.eu)) of the department EMS business development.*

# the website offers more yet

Our website shortly will have a French version. With it we are fulfilling the wish of many who find it simpler to be addressed in their own language. But our website not only will have an extension in the field of language, but there will be some adaptations concerning its contents. Order tracking will be made available for our Geel branch as well. Clients of our Belgian branch will be

able to follow exactly the status of their productions at the website and can keep in touch with what is happening. This comes in very handy when you want to keep up your planning, so it seems from practice. It goes without saying that this order tracking tool is only to be used by authorised persons. The changes on the website will be used as well to check up the contents with the current state

of business. Current events force us to remain critical. With the announced changes we keep completely up to date anyway!



## girls enthralled by technology

*Girls and technology? According to old-fashioned views there is still the idea that this is not a suitable combination. Practice, however, proves that this assumption is undeserved. It is remarkable that women tend to score better in the learning process, but do not opt for studying technology or engineering. Unknown, unloved, or so it seems. It appears that in Flanders in engineering studies the ratio male-female is 84 to 16%. In order to do something about it, various companies in Flanders show that girls and engineering indeed do fit each other! Within the project 'GirlsDays' girls in the higher forms of primary schools are becoming acquainted with the production processes in various companies.*

### to Geel

That is why a group of 25 girls visited our premises in Geel on 21 January to see what

is produced there. And they didn't only watch, but the ladies had to get going themselves in a soldering workshop. Their dexterity with the soldering iron was being tested there by producing an electronic dice or a wheel of fortune. With great fervour this gadget, which of course they were to take home, was put together. Proof that women really can work with technology! It is expected that due to this playful acquaintance of technology and engineering the odds are that women opt for a follow-up study in this branch of studies.

### All over Flanders

The GirlsDays are being performed at about 25 companies on various Wednesday afternoons, spread over the first three months of this year. In April collective closing festivities took place (with the parents) in the Technopolis at Mechelen: the "place to be" if promotions of technology are concerned. The so-called GirlsDays occur frequently at various companies in Flemish Belgium. It is a collective initiative of Agoria Flanders (a federation of about 1,500 companies), Technopolis (the Flemish hands-on centre, a permanent

platform for science and technology) and the Flemish authorities. The initiative is being realized owing to financing of the Flemish minister of Equal Opportunities Kathleen Van Brempt.

### super coooool

To conclude a few phrases by the young ladies themselves: *the day was mega-cool*", *"it was super"*, *"it was mega-smashing"*, *"next year another such a GirlsDay"*, *"It is a huge company"*, *"It was super coooool"*, *"see you next year"*, *"much learned"*, *"I thought it was dead-smashing"*.

And answers to the question "what would you like to become later": *"a nursery schoolteacher"*, *"a professor of medicines"*, *"a vet"*, *"an architect"*, *"a teacher"*, *"a PA"*, *"a photographer"*, *"something to do with computers"*, *"a psychologist"* ... *but very often as well "I don't know"*.

# boxbuilding in Dirksland as well



The *tbp* electronics branch in Den Bosch, known for its box building activities, moved to Dirksland at the end of last year. One of the reasons for this action is further optimization of the entire logistics process. The former Honeywell-company, specialized in the production of equipment and cabinets, sits now next to our location on the Vlakbodem. Kees Vis, (manager facilities & QA/QC at *tbp*) in charge of the move, is looking back upon a successful operation: "earlier this year already the testing group of the printed circuit boards had moved. Those employees are housed in the premises at the Vlakbodem in Dirksland. In December last year the move was finished for the last eight employees of the box building group. They are now working in our annex at the Watertoren". The people who did their job previously in Den Bosch, are doing it now in Dirksland. Unfortunately, this means extra commuting time for them. *Tbp* has arranged two mini-coaches that are commuting between Den Bosch and Dirksland on a daily basis. That extra time our colleagues take for granted. What is in it for them is that their jobs will have somewhat more variety in them: where once they had to work for one client's products, there are increasingly different clients that want to have other sorts of products. The move has been realized according to plan. Firstly, the logistics part was moved: storage, stock etc. Next the production facilities followed. Thanks to good agreements with all those involved the production could be continued entirely almost without any gaps. All facilities such as electricity, telephone lines, etcetera were ready in time. As there frequently will be an exchange of products or components between the premises at Vlakbodem and Watertoren, we have searched for a good solution for their transport. Kees Vis: "The distance is about 150 metres. We therefore have a special bicycle that has some resemblance to that of a pizza deliverer, in store for the small and quick work. We have a car at the ready for the somewhat bigger work". In the long term this solution will not be necessary anymore. At the industrial estate at the Vlakbodem there will arise a new building for our box building activities. The architect has to start drawing yet, but the piles are already in the ground. "For the time being we can work rather well at the Watertoren and we can deliver to our clients accordingly", as Kees thinks it over and looks back upon a successful action.



# The Live PIL

## at Electronics & Automation

You soon will be able to see it working again: the Live PIL (Production Integration Line), diagonally across from the tbp stand (8B019). At the next fair Electronics & Automation (Utrecht, 27-29 May 2009) you can witness a complete "mini factory", in which complete and tested print boards are being assembled. In this production line the assembling of the print is taking place that is part of the gadget that quite a lot of visitors will be interested in: an electronic wireless temperature meter. You can read on page 3 of this edition how to get one of these gadgets.

### Cooperation remains indispensable

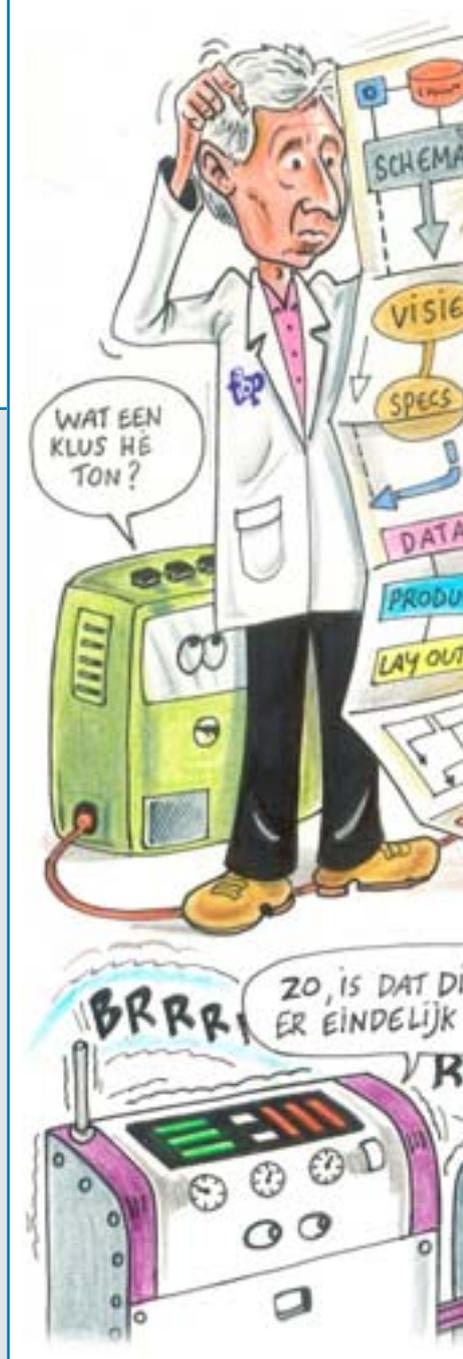
The set-up of the Live PIL is basically the same as that of two years ago. A remarkable difference is that now many other suppliers of production machines are taking part. The set-up of such a production line remains the work of specialists. And of course it is always thrilling. "Prolonged due to success" is the reason why consultant Ton van Galen will direct things again. He keeps track of the contacts with about 15 suppliers and has to manage that all machinery is working well together. There is not much time for test runs. The day before the fair opens the machines will be brought together and will be assembled into one production line. Utilities (electricity) will have to be connected and then the whole line should work.

### standardization

It has been pointed out before: the set-up of such a production line is a matter of making good arrangements between machine producers, both about mechanical and electrical aspects. Fortunately, there has been much achieved already with respect to standardization in this field. Agreements on for instance dimensions and electronic control have been put down by SMEMA: Surface Mount Equipment Manufacturers Association. Without such standardization the setting up of the Live PIL would be out of the question at such short notice. The existence of these standards prove to be very helpful to buyers of machines as well: they are able to compare the machines of various producers well and they possibly can assemble them with machines of different producers. This enables an optimal set up of every production line.

### the production line

Although the set up resembles in broad outlines the one of two years ago, we take a mind walk along the various stations in the production line. The loader that makes that the boards are being sent one by one from the feeder to the screen printer. This printer applies soldering paste with the help of a stencil to those places where later on an electrical connection between printing board and component is desired (like a silk screen method). It is also possible to apply paste with a paste jet machine, such as is the case in inkjet printers, however this method will not be shown during the live production. To check whether all places have a soldering paste coating, an automatic inspection takes place with a three-dimensional camera. The pick-and-place machine subsequently places the various components – that are mostly on a reel, in a stick or a tray – on the printing board. Obviously, this all has to happen very carefully and very precisely. At each movement of the board the components can shift causing undesired situations. As soon as the placing process is over, the soldering process takes place in a Vapour Phase-machine. One of the particulars in this installation is that a special fluid is used with a fixed boiling point that offers in the vapour stage the ideal circumstances to prevent corrosion as this vapour is totally inert. Another method is a hot-air oven with nitrogen or air in which the soldering takes place (not present). Possible assembling of special components, that cannot be assembled automatically, such as temperature-sensitive components and



connectors, follows after the soldering. After the soldering process and the manual assembling another visual inspection takes place with a so-called AOI, this is Automatic Optical Inspection. Next follows an electronic testing program in order to see whether all connections are making contact. If this testing process ends with an "ok", then a so-called functional test follows in order to check whether our end product is functioning in reality.

Printing boards that do not reach the finish normally are gathered and are being repaired if necessary.

### the end product

Of course you want to see the result



# Jos Corstjens:

## Flemish Business

### Excellence Manager 2008



*Jos Corstjens, director NPI, SHEQ, Engineering at our Geel branch, received the title of "Business Excellence Manager 2008 of Flanders" at the end of last year. An award you do not easily receive. The reason that the Flemish Centre for Quality granted him this award, is that he has shown to increase considerably the quality of the business processes mostly at the Geel branch. In it Jos functioned clearly as a positive catalyst.*

#### How things were

In 2001 Jos accepted another office within the then Alcatel-Lucent and moved therefore to the Geel branch. His orders were to map the business processes with the goal of optimisation. From his background with knowledge of Business Process Re-engineering he concluded that real craftsmanship was delivered, but that business processes left a lot to be desired. It proved difficult though, to put the finger on the weak spot. Some processes could improve, but the time to talk it over failed. There was no time for such things, was the general view. Jos was unabashed and suggested to brainstorm with some forty people from the organisation during a weekend. This worked, and it produced eleven project proposals that showed after some months a directly measurable gain of time. The tone was set; the employees' enthusiasm was stirred. Jos about this "That project to come to the ideal factory, we called it simply IF, the ideal factory. The starting point was: how would we act if we should have the chance to start completely anew with this factory? What can we do better and simpler?" These questions as well have led to a discussion, its key motive being: "simple, visual and by itself".

## Convert on time! electronics soon lead-free



Every electronics producer has to deal with them: RoHS and WEEE. Letter-words that stand for Restriction of Hazardous Substances Directive and Waste Electrical and Electronic Equipment Directive. So these are rules, formulated by the European Commission that determines how we have to deal with hazardous substances and waste of electronic equipment. Their goal is to reduce the use of some hazardous substances that appear frequently in electronics. In practice this means that soldering of conventional soldering connections with tin/lead basically is not allowed anymore from the commencing date (1 July 2006). Fortunately, when the occasion arises release has been granted in

a transitional arrangement, but this ends on 1 July 2010. This means that all printed circuit boards will have to be produced via a lead-free soldering process as of next year. How things have been laid down in European legislation, you can read at the website: [http://ec.europa.eu/environment/waste/weee/legis\\_en.htm](http://ec.europa.eu/environment/waste/weee/legis_en.htm). Unfortunately, the major part of our clients seems to procrastinate on the consequences. Lead-free soldering means that current productions need to be adjusted. Let alone the higher temperatures needed in lead-free soldering that ask for application of other components. Design and BOM (Bill of Materials) will change, new agreements with suppliers are necessary. And all this

needs time. Please, make sure that you won't get into any problems and convert on time. It is in your own interest! And you know: tbp will help you with a possible re-design of your product. Our specialists will advise you gladly.

## slide

In fact a start was made according to the principles of sound reason: a good preparation, a maximum simplification of processes, a fast flow and a maximum focus at activities that add value for the client. Jos likes to visualize this approach by the metaphor of a slide. "Before we can slide gladly down, we first have to shift the necessary work. We have to climb. We see that translated in our company into the preparatory work. At the top we stand at the "point of no return": we let go and slide automatically down. While sliding our production process takes place. That is the flow-principle. Production passes off smoothly and basically without any problems. No splinters are allowed in the slide. That hurts."

## good preparation

From the previous it is clear that a good preparation is a requirement to keep the flow at an optimum. Jos: "We use the FiFo-principle. FiFo stands for First In, First Out. First come, first served, we would say. It creates clarity for every employee and avoids errors. It took three years before this principle got practically hold of the shop floor. This was mainly caused by the fact that time pressure was too high in order to think it thoroughly through. I say sometimes jokingly 'you're not acting well, if you are acting this way.'" Much attention is paid to the entire flow trajectory. Of course this means that somewhere in the production process an imbalance is created. An operator cannot get rid of his new products because the previous products in the next station are not yet processed. The operator does not have to stop working, but can be deployed elsewhere in order to quicken the process. That is called flexibility. What's more: our operators master on average 3.8 jobs. That makes the job for people extra attractive!

## results

The efforts that have lead to considerable improvements already in the early years, did not go unnoticed by the management. The management decided to set up an organisation under the name of Business Process Solutions (BPS). Nancy Grieten and two of her colleagues in part time are now permanently trying to optimise the process flows further. Special teams with "key users" frequently meet to see where improvements may be possible so as to further re-adjust the processes.

## tois

Besides the set-up of BPS another method to enforce the quality of smart production has been realized: tois. Tois is short for tbp's operations improvement system, as if it were improving without effort. This in fact has been the build-up to tois! A method in which a team of employees of one department get together for three days on a monthly basis to map their processes, mark the bottlenecks in it and devise a solution to it. The first experiences already have brought about positive effects. "We keep improving", Jos says, "Since our clients will reap its fruits."

The European Organisation for Quality - active in 34 European countries and in existence since the 1950's - elects a specialist in the field of quality matters each year. This year this organisation has elected Jos Corstjens as best in his specialty and awards him the title of European Quality Leader 2009. The Flemish Centre for Quality has recommended Jos at the time as a candidate for this beautiful title. The prize-giving ceremony, by the Croatian president, will be mid-May in Dubrovnik. More information: [www.eoq.org](http://www.eoq.org).

## your contact with tbp

Tbp electronics can only live up to its ambitions when there are good contacts with (potential) clients. Fortunately, in this time of e-communication there is much attention for man-to-man-communication. Frans Geerts is our man in The Netherlands who has been active in the clientele since a long time already. Although he is a mechanical engineer originally, he was immersed completely in the world of electronics during his time with Alcatel-Lucent. He knows the tricks of the trade and he uses his knowledge well to hold on to new clients.

Bas Dorren from our Geel branch has been disengaged especially to conquer the German market since 1 February. Bas, by birth a genuine business developer in the chip market, is an electronics man pur sang and is starting his activities with the drawing of a marketing plan. His next move will be to get potential clients in this European country interested. Partly due to the decreased eagerness to bring Electronics production to Asian countries and



Frans Geerts



Bas Dorren

because many clients see the advantages of production nearer to home, expectations are great. The sales team, supervised by Bart Cox, is completed for the Belgian market with the experienced sales manager Werner de Smet since shortly aided by Erwin van den Broeck.

# SurfTable

## sweetens hospitalization



Generally, you don't stay in hospital for pleasure. Many a patient must keep to his bed forced by circumstances. Isolation and boredom are luring, with all that that entails. The Swiss company SurfTable has found a solution that can sweeten a patient's hospitalization considerably. They have worked in their own laboratory for a couple or years on what you may call a revolutionary product: a bed table with an integrated pc/TV screen – one could say a terminal- especially for use in hospitals. This bed table can be seamlessly fitted

to the current furniture the standard bedside table. The prototype meets the criteria required and it has raised the enthusiasm of the hospital world in the mean time. Time for its production! SurfTable has assigned the production to tbp electronics and has concluded an exclusive three-year contract. It is a special communication product for our medical trade from the assembling facilities in Geel. The first couple of hundred samples will be produced and distributed this spring..



Watching TV and films



Internet access



Selecting and listening to spoken words



Scratch-resistant and easy to clean



Connection for head-phones



Direct access to patient information

### multimedia in bed

Developments in the communication market have pushed up considerably the possibilities in the last few decades. Things such as mobile telephones, the Internet and e-mail have all become common property. It is peculiar that in health care these things did not expand, in particular for patients. Even more peculiar: in many hospitals mobile phones are not allowed. The patients' individual communication with the outside world remains restricted. So far (hospital) patients remain deprived of communication with their surroundings, but the SurfTable is a considerable improvement in it. SurfTable is the name of a (standard) bed table with a built-in screen. Via this screen all imaginable communication will be possible: watching TV and films, surfing on the Internet, e-mailing, listening to and selecting music or spoken words, etcetera. All data flows are within a hand's reach of the patient who is confined to his/her bed. Medical staff can consult patient files, illustrations and the like or add specific information via the same screen – by means of a personal login and pass word. You can call it certainly a piece of high-tech electronics that will sweeten the patient's and doctor's life alike. As accessories a loose keyboard with touch pad and a remote control for TV use are available. SurfTable meets the requirements of all those involved and forms one integrated part of the hospital furniture.

### Making the prototype ready for production

A lot is involved in the development of such a product. It is not only a question of integration of a pc with TV-facilities, but there are special requirements for the mechanical characteristics as well. A screen in a bed board seems an almost impossible task. The board has to be scratch-resistant, the image has to be clear, it has to

be easily cleaned and easy to control. And we haven't said anything about the bacteriological aspect yet. Many partners were involved in the realisation, for instance the search for the right synthetic material and suppliers. All these efforts have led to a product that meets all criteria. The start exists of the production of a small series, before switching to larger numbers. In this stage we can build up experience with the production from which we can learn for the production of larger numbers. At this initial stage of production the prototype is scrutinized, both qua applied electronics and qua mechanical construction. Before a production line is set up, the engineers in Geel will have to set up the right methods and processes. If needed the mechanical and electronic design will have to be adjusted. All sides will be gone through: from design to packaging and distribution. Almost obviously they are cooperating closely with the client SurfTable that as originator is expected to conquer the market world-wide. The first products soon will be directly shipped to the buyers from tbp Geel. Distribution and after sales will take place via Aprolog ([www.aprolog.com](http://www.aprolog.com)) in the near future as well. Aprolog is among other things tbp's logistics partner.

### characteristics

The SurfTable infotainment-solution has been set up in such a way that the patient will be able to communicate with the outside world as easy as possible, so without needing a course of some sort. The accessories as well have been devised durably and the maintenance is kept to a minimum. The standard TVs in the hospital wards, hanging mostly from a bracket from the wall or the ceiling, have become redundant. The flexibility in the use of the hospital ward will improve as well with it.

In short SurfTable offers a treasure trove

of communication and information (infotainment):

- access to the Internet,
- complete e-mail-functionality,
- music selection from the hard disc,
- films from the hard disc,
- language options,
- over 200 programmed radio channels corresponding to country, region and language,
- a variety of games (suitable for intranet in a patient-to-patient network) and
- direct access to local or world news and patient information.

Connections remain restricted to the (standard) infrastructure that is already present in the hospital. The installation of extra connections or installations is not needed. Soon you will be in hospital for your own pleasure. Or won't you?



# Alcatel-Lucent brings Internet communication to perfection



Alcatel-Lucent is with its about 77,000 employees one of the largest players in the field of telecommunication. The company's point of view indicates immediately what it is all about in this company: improving communication possibilities through

which peoples' lives become enriched. In addition to (mobile) telephone systems the Internet plays in it an increasingly greater part. Mr. Yves Guinée, general manager of the Industrial Competence Center of Alcatel-Lucent in Belgium, is concentrating on the production of network equipment for the Internet. To his circle of clients belong the licensees: service providers and large companies that are using their own telecommunication networks. Yves is concentrating in particular on the equipment that is indicated as fixed access products for DSL, Digital Subscriber Line. So network products that make up the connections between the Internet and its users.

## in Geel everything is continuing normally

Alcatel-Lucent's relation with tbp electronics is a rather particular one. As former owner of the production facilities in Geel Alcatel-Lucent may consider itself one of the oldest and most reliable clients of this company. Until May 2007 this branch was its own production company. The sale to tbp electronics fitted completely Alcatel-Lucent's policy to work more "fabless". This meant that in fact the relation client-producer took on a different aspect. Yves is seeing it more like an advantage: "In the take-over it was agreed that the Geel branch will keep on producing for Alcatel-Lucent at least for a couple of years. This amounts to about 20 to 25% of our total needs. We are considered to be more of a real client and that offers certainly advantages. And as we were in charge ourselves, we know that the products' quality will meet our expectations." The production of equipment is controlled world-wide from Antwerp. Yves: "We also use facilities in China, North-Mexico and Romania. All orders, except for those from North-America and China, are all done via Antwerp." Alcatel-Lucent develops and supplies all equipment for the infrastructure of networks. Many of them you can find in district exchanges and distribution boxes. For DSL for instance we use about 30 different types of printed circuit boards. Most of them are serving as the linking of line boards with the copper network. In addition there are special pcbs for extra services or checking

functions and for special user groups. Think of the railway companies, public transport (telecommunication in combination with road traffic signs). All of them are printed circuit boards produced in Geel. Alcatel-Lucent is not focusing anymore on commodity products such as modems for end users. The production of such modems has been transferred to the French company of Thomson since 2001. Alcatel-Lucent however, is often involved in the development of new products. They have developed for instance a fibre-optic modem of their own, the production of which has already started.

## Cable work

In the conventional world of telephony each landline is connected to the telephone exchange via a cable. Since the introduction of the Internet this so-called local loop is used as well as a means of transport for the Internet traffic. Initially the telephone connection was "abused" for Internet traffic, but quite rapidly ADSL came forward. Developments into offering VDSL are taking place in Belgium. Yves Guinée about it: "This technique renders an even larger band width for the user than ADSL does. Depending on the distance of the cable from the exchange to the user there is a profit possible of about four to five times with respect to ADSL, in which band widths to about 40 Mbit/s are feasible. The cable connection however needs to be of good quality. It goes without saying that the provider also must cooperate in wanting to offer this band width. Due to this broader band width the provider will be able to offer more new services. The simultaneous passing on of two different TV-programs via the Internet will be possible then. If the distance between the exchange and the user is too large, then the band width will decrease rapidly, unfortunately. A recent development in cable country is the so-called fiber to the home. Fibre-optic connections provide for super-fast Internet traffic. Hard work is done to connect the local district exchanges with fibre-optic cables. From these exchanges it is possible to apply fibre-optic directly to the user or copper cables with a short length (up to a couple of hundred metres). There's a lot to be done!

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