

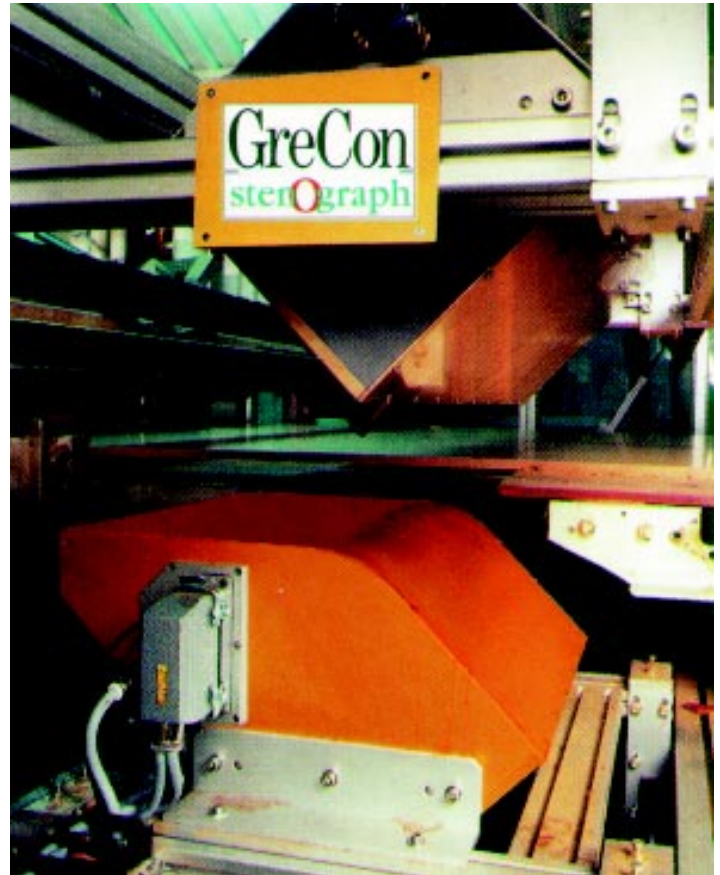
“Expectations clearly confirmed...”

Experiences with the first Raw Density Profile Measuring System StenOgraph used in a particleboard plant.

The StenOgraph On-line Raw Density Profile Measuring System, which sets new standards for process control and process optimization as well as for product inspection, was launched in 1996. Since then, it has been installed in ten continuous production lines of the panel industry (nine MDF, one particleboard). The system, which was developed and tested by Wesser & Dueholm company in Copenhagen and which is based on x-ray technology (compare HK 11/95, page 1394 ff), is now manufactured and distributed by GreCon, Alfeld, Germany. The cost of purchase amounts to a good DM 0.5 Mio. - an amount which the manufacturers of wood-based panels have not been used to investing in a measuring system until now.

The indisputable importance of the instantaneous scanning of the raw density profile as a direct application feature has only been recognized by the still young MDF industry, which might more likely be prepared to fall in with new technology. The comments and arguments of the longer established particleboard industry do not yet reveal any breakthrough to this industry, where there is still a need to sufficiently know and control the production process. Furthermore, the particleboard manufacturers do not seem to attach the same importance to the raw density profile application feature as do the MDF manufacturers.

The Danish particleboard manufacturer, Novopan Traeindustrie AS, were less hesitant in this respect, but also had to be convinced by practical tests. At the beginning of this year, the company installed a StenOgraph system in its particleboard plant (start-up 1991), the technological condition of which can be described as modern, on a trial basis and has now decided to keep it. From the managing director, Mr. Tage Bojsen-Møller, and the head of quality, Mr. Henrik Skovbo, HK editor, Mr. Wolfgang Rüter, wanted to know the motives which led to the decision to purchase it and what experiences they've had with the raw density profile measuring system.



Question: Mr. Bojsen-Møller, two years ago, Mr. Dueholm, the inventor of the Raw Density Profile Measuring System StenOgraph, was asked during a lecture - you attended it - how much such a system costs and he answered: “Why don’t you ask how much money can be saved with the system?” Can you comment on the answer based on your own experiences?

T. Bojsen-Møller: Well, half a million DM for a measuring system - that is a hell of a lot of money. You have therefore to compare the advantages through the use of the system with the cost savings to decide whether it is expensive. We definitely wanted to reduce the weight of our particleboard noticeably to save material. The technological material features of our particleboard, however, must not be affected or impaired. It can be proven that we achieved this ambitious goal. Also, we could minimize the amount of rejected material, which can also be proven statistically.

H. Skovbo: I would like to mention another, very important aspect. Like most of the operators of continuous presses, we took over the traditionally used press programs. These programs usually plan a very high press-pressure at the entry, a very low pressure in the middle part and again a very high pressure at the exit for thickness calibration purposes.

Thanks to the continuous measurement of the raw density profile, we are now in the position to verify these traditional ideas of a correct press-pressure, to rectify it and finally to find our individual press adjustments. This is why we are operating our press in a different way today than we did one year ago: it is running more stable, with less pressure and, above all, faster. Furthermore, the risk of running blisters is almost eliminated because the preliminary stages of blisters are clearly visible on the StenOgraph monitor so that the production process can be rectified in time.

Question: What do you mean by “above all faster”?

H. Skovbo: I could say a lot about this. The faster production speed is shown in the increased capacity, in a scale of 30.000 to 40.000 m³ per year actually. But, in all other respects, our again optimized process data is not available for outsiders, as you will understand.

Question: And what was the decisive factor which induced you to purchase the system after almost a year of testing, Mr. Bojsen-Møller?

T. Bojsen-Møller: Well, after a year of testing under the roughest, realistic, operation conditions, and in our special production (which distinguishes itself by frequent changes) all our expectations had clearly been confirmed. At that time, the new technology was largely unproven, and there was also the fact that the benefit, i. e., the optimization potential, for the particleboard production could not clearly be recognized. You have to take into account that we have been using the “Prodacon” system for recipe management for a long time and that we have been quite progressive with it. But we also knew that we would not make much progress with this parameter optimization alone. The question, whether there was enough further optimization potential for us due to these facts to justify a purchase of the raw density profile measuring system, has now also been answered positively. Furthermore, we were surprised that our operating staff was familiar

The Company

The Danish company Novopan Traeindustrie AS was the first company in Scandinavia which produced particleboard. Production was started in 1950 according to the patents of the Swiss inventor Fred Fahrni.

Headquarters: DK-8550 Ryomgard

Branch: DK-4171 Glumsö

Improvement branch: DK-8800 Viborg (Vibopan AS)

Management: Tage Bojsen-Møller

Employees: 340 (total)

Product range:

- Raw particleboard as standard product (good 15 %), 6 to 40 mm.
- Special panels according to the customers' requirements (good 8,5 %), e. g. light surface layer quality, especially dense surface layer, high rigidity, high raw density for loudspeaker construction, EDV double bottom, constant homogeneity.
- Particleboard for building purposes as well as tongue panels (V20, V100/V1000).

Presses: in Pindstrup a Dieffenbacher Conti-Panel press 34 m x 2,75 m (model 1990); in Glumsö a Bison single-opening press 11,1 m x 2,65 m (model 1973).

Capacity: in Pindstrup presently a good 300.000 (related to special panels) to 400.000 m³/a (related to standard panels), in Glumsö 60.000 to 70.000 m³/a, depending on the panel type.

with the StenOgraph technology so quickly and very satisfied with the measured values. They do on no account want to do without the system because it offers them an enormous aid to decision-making and safety not known before. Regarding the StenOgraph, we convinced ourselves that this technology is working perfectly, even better than most of the other measuring systems which are used in the press area.

Question: Had there been conditions under which you would not have purchased the system?

T. Bojsen-Møller: Of course, if the system had not worked, we would simply have given it back. But the system did work perfectly, and our fundamental requirement to save at least 1% weight and material was easily and clearly more than fulfilled. By how much remains our trade secret.

Question: Mr. Skovbo, as the person responsible for product quality, you should have a special interest in this measuring system. What were your initial doubts, and how does the system help you keep the required features of the panels?

H. Skovbo: Surely, the online raw density profile measuring system is a very big aid for me since with the usual method hours went by until I and, above all, our five senior shift engineers knew whether the panel is OK or not. Despite many years of experience with the adjustment of the production parameters of our plant there always remained an element of uncertainty. We no longer have this problem since we've been running with the StenOgraph system. My initial doubts about this new measuring technology proved unfounded.

Question: How are you satisfied with the handling and operation of the system?

H. Skovbo: The operation of the system is uncomplicated. We had specified our requirements, and the software was adapted to them. However, despite the robust construction of the system, one has to be aware of the fact that it is a highly precise measuring device which has to be treated with care. Maintenance, basically, consists only of keeping it clean.

Question: Was the system supplied "ready for connection," or were special adaptations to your particleboard plant necessary?

H. Skovbo: Except a slight modification to the existing roller conveyor after the press, the StenOgraph system was, in principle, all ready for connection. The mounting of the frame with the measuring device, the installation of cooling unit and control console in a side room as well as the final calibration of the system took about one week. Special modifications to our particleboard plant were not necessary, and the production interruption was less than 24 hours.

Question: Do you think that it is necessary that, after the commissioning of the system, the supplier takes care of the operator, and, if yes, in which respect?

H. Skovbo: As you might know, the first prototype of the Raw Density Measuring System StenOgraph was installed in our factory for testing purposes in 1994. Dr. Dueholm and employees of the Force-Institute ran practical tests under production conditions at that time. Of course, we followed these tests on the sidelines. But we do not think special care by the manufacturer after installation of the present type of the system to be necessary since the system is very user-friendly.

The Persons

Tage Bojsen-Møller (59), chartered mechanical engineer and expert on industrial management, took on the management of the Danish Novopan Traeindustrie AS in Pindstrup (Jutland) in 1982. As representative of the Danish particleboard industry, he was elected onto the board of the European Federation of Associations of Particleboard Manufacturers (FESYP) in 1984 and was its president from 1985 to 1990. Furthermore, Bojsen-Møller has been a member of the board of the European Association of Wood Industry (Cei Bois) since 1988 as well as a member of the supervisory board of the Danish Employers' Federation.

Henrik Skovbo (33) is a chartered chemical engineer and responsible for quality at Novopan Traeindustrie AS. He joined the company in 1990. At that time, the company started to build its new particleboard plant, the core of which is the second Conti-Panel press of Dieffenbacher. Henrik Skovbo witnessed and looked after the entire creation of the today's plant right from the start.

Question: Had you been made familiar with the possibilities and the problems of this technology in any way prior to the purchase, or in your case prior to the agreement to a test run, and are there any deficiencies in this respect?

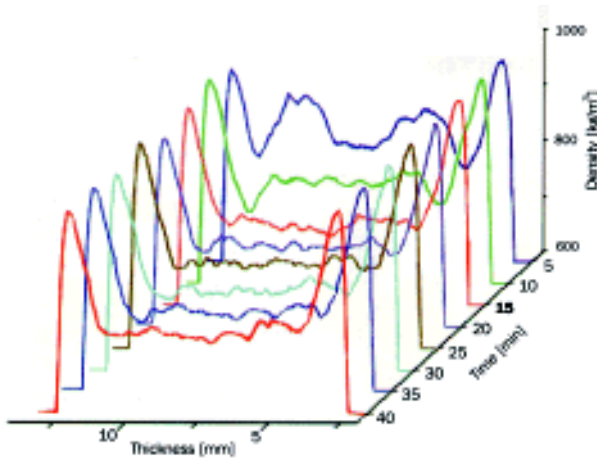
T. Bojsen-Møller: As Henrik Skovbo already mentioned, our company, which is always open to modern and new technology, gave Dr. Dueholm the chance to test his system in our factory. Despite the gained knowledge, all of us at Novopan agreed one year ago that we did not need an online raw density profile measuring system in our particleboard production. But you see, we have fundamentally changed our opinion in this respect, too. Now, we do not want to do without it. Regarded in this way, the more intensive presentation of the capabilities of the StenOgraph system seems to be quite reasonable. I say this very reluctantly because other particleboard manufacturers will then certainly install this system in their production, too, and our lead over them will reduce again, but we will not be able to prevent it. New technology always requires a certain amount of time for it to come to the fore and become accepted as a standard. In the long term, it will surely be accepted.

Question: Let me refer again to your requirements regarding weight and thus material reduction. Have

your expectations really been fulfilled?

T. Bojsen-Møller: Yes, our requirements were fulfilled very satisfactorily. We achieve clearly more than 1% reduction in weight and material now. Unfortunately, I cannot tell you more about this.

Question: *Mr. Skovbo, did Novopan reap any other benefits for the production process and for the product itself from the installation of the StenOgraph system? What are they?*



StenOgraph Profile Display

H. Skovbo: A considerable advantage, which resulted from the installation of the StenOgraph system, is the exertion of influence on the press profiles in the continuous press in connection with our numerous panel types for special applications. Thanks to the measured data, we can organize these press profiles in a completely different way. As already mentioned, the plant became thus much faster, and we can even think of the production of completely new panel types.

Question: *Mr. Bojsen-Møller, I know that you have a well run particleboard plant and a good staff. Is it reasonable, nevertheless, to equip such a factory with an online raw density profile measuring system?*

T. Bojsen-Møller: If you want to exhaust the advantages of this system, you need in any case a well working plant and a good team. Our particleboard production had already achieved a high level regarding optimization, but we also knew that we would not get much further. This way is open to us again now. And you must not forget one thing when speaking about our team: we are working around the clock 365 days a year, and are changing the thickness or type up to 20

times within 24 hours and this in five shifts with similar teams. It is extremely helpful to solve this difficult task in an optimum way and with constant accuracy with a system which is easy to handle.

Question: *How would you judge the use of the StenOgraph system in a continuous particleboard line from your current experiences, and looking back on your reservations?*

T. Bojsen-Møller: I would have to repeat my statements because I think that all that needs to be said had already been said. But once again: the purchase of the Raw Density Profile Measuring System StenOgraph was right, and we are flexible enough to continue to learn and to revise prejudices.

Question: *To come back to my initial question. Is such an investment worthwhile for a particleboard plant, or do you still see the use of the system exclusively in the MDF industry?*

T. Bojsen-Møller: From the available figures of our production of the past months and from the many positive remarks of my colleagues (who, by the way, had almost no criticisms), I can only say that the investment was worthwhile, at least for us. We, i. e. all Novopan employees, who deal with the system directly or indirectly, do no longer see the use of the StenOgraph system exclusively in the MDF production and absolutely not only in new production lines. But what I cannot understand is that there are obviously still many MDF manufacturers who consider such a system not to be necessary for their production. Especially for MDF, the customers always demand the proof of a raw density profile. With such a system, it would be very easy to provide a raw density report for each shipment, theoretically even for every single panel. Even for particleboard, this demand is more and more frequent, especially when producing customer-specific particleboard, like we do.

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