

WEINMANN - Calitate prin automatizare

Actualmente firma Storen, din localitatea cu acelasi nume, are 130 de angajati si produce, pe o suprafata de 16.000 m², in jur de 500 de case prefabricate precum si intre 40.000 si 80.000 de sarpante pe an. De la proiectare si pana la livrarea "just-in-time", aceasta intreprindere in continua expansiune, ofera firmelor de constructie cu care colaboreaza, serviciile sale sub forma unui vast pachet, integral. Am stat de vorba cu directorul intreprinderii, dl. Roald Haug.

Rev. Performance: "D-le Haug, cum estimati dezvoltarea, in viitor, a domeniului norvegian de constructie a caselor din lemn? Se va accentua trendul automatizarii?"

Dl. Haug: "La aceasta intrebare raspund, fara ezitare, "da". Motivul il constituie, pe de-o parte, noile reglementari, mult mai stricte, din legislatia noastra in domeniul constructiilor, privind eficienta energetica, respectiv etanseizarea caselor, pe de alta parte, lipsa evidenta de personal calificat care se manifesta in Norvegia. In domeniul constructiilor din Norvegia activeaza, actualmente, cca. 150.000 de lucratori straini, o cifra care vorbeste de la sine!"



Introducerea izolatiei pe statia de asamblat cadrele din lemn
Installation of insulation at the framing station

Rev. Performance: "Va rugam sa ne specificati cateva din motivele care v-au determinat sa investiti intr-o instalatie WEINMANN."

Dl. Haug: "Ne-a fost foarte clar ca putem ajunge la un raport optim calitate/preț si la o constanta a unei calitati ridicate, numai printr-o automatizare avansata. Impresia foarte buna, pe care aceasta calitate o imprima clientului, este factorul care asigura, in final, succesul unui producator de case eficiente energetic. Deoarece, datorita tehnologiei noastre moderne de fabricatie, suntem in situatia de a furniza case de cea mai buna calitate, construite in timpuri redusi si la preturi competitive, ne putem bucura de o crestere permanenta a numarului de comenzi si a cifrei de afaceri. Daca, in anul 2011, am atins o cifra de afaceri de 25 milioane Euro, pentru anul 2012 estimam o valoare de 35 milioane Euro."

Rev. Performance: "Cum este organizata productia dvs. de elemente de pereti si acoperis, cu instalatia WEINMANN?"

Dl. Haug: "Linia de fabricatie este compusa dintr-un sector de fabricare a peretilor si un sector de fabricare a elementelor de acoperis si planseu, unde linia de fabricare a peretilor este conceputa pentru o capacitate de cca. 0,35 m/min, pereti exteriori. Prima



Roald Haug,
Director of Norwegian prefabricated housing manufacturer Storen Treindustri, Storen (near Trondheim), Norway

Quality through automation

Storen, which is located in the town of the same name, currently employs 130 staff and produces around 500 prefabricated houses and between 40,000 and 80,000 roof trusses per year on a site covering an area of 16,000 m². From the planning stage to "just-in-time" delivery, Storen, which is undergoing major expansion, offers its services to the construction companies with which it works in the form of a large complete package. We spoke to the company director, Roald Haug.

Performance: "Mr. Haug, how do you think Norwegian timber house construction will develop in the future? Will the trend go more toward automation?"

Haug: "I am able to answer this question with an unequivocal "yes". One reason for this are our new building regulations regarding energy efficiency, which are considerably more stringent, as well as how airtight the houses are required to be. Another reason is the distinct lack of qualified specialists in Norway. Around 150,000 foreign workers are currently employed in the Norwegian construction industry — a figure that speaks for itself!"

Performance: "Please tell us a few reasons why you have decided to invest in a WEINMANN production line."

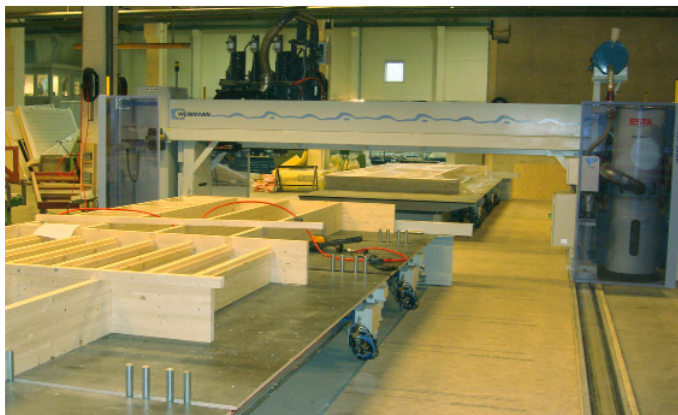
Haug: "It became clear to us that we would only be able to achieve optimum value for money combined with consistently high quality by implementing a very high degree of automation. This quality gives the buyer an impression of reliability, which is what ultimately determines the success of a modern, low-energy house manufacturer. As our modern manufacturing technology enables us to supply houses of an excellent quality within a short construc-



Croirea si capsarea automate a elementelor de placare, cu ajutorul puntii multifunctionale
Automatic cutting and planking of the formwork with the multi-function bridge

tion time and at competitive prices, we can enjoy a steady increase in orders and, as a result, turnover. In 2011, we were already able to achieve a turnover of EUR 25 million, so in 2012 we expect a turnover of around EUR 35 million."

componenta a liniei este o statie WEM 150, pentru asamblat cadrelor din lemn, statie care lucreaza cu lungimi standard ale lemnului brut pentru talpi, aducandu-le apoi pe acestea, automat, la lungimile specifice clientului, cu ajutorul preselor pentru placi multicui si a circularilor de retezat la capete. In plus, in acest loc se introduce materialul de izolatie intre montanti, montandu-se totodata modulele pentru ferestre si usi, cu ajutorul unei statii complet automate. Dupa ce lucrarile pe aceasta statie sunt incheiate, cadrul de lemn, impreuna cu izolatia, este transportat, automat, pe o masa unde este pozitionat, cu respectarea perpendicularitatii si, in functie de optiunea clientului, este placat cu placi de asphalt sau rigips. Fixarea si croirea placilor se face complet automat, prin intermediul unei punti multifunctionale (WMS 100), in timp ce montantii partial curbati sunt adusi in pozitia corecta, cu ajutorul unei axe NC suplimentare.



Masa de motaj, cu comanda numerica, pentru elemente de acoperis si planseu
CNC-controlled assembly table

Astfel, se asigura precizia maxim posibila a elementului si ca toate cuiele de fixare nimeresc lemnul, garantandu-se prin aceasta statica viitoarei case. O imprimanta Inkjet, montata pe puntea multifunctionala, insemneaza pozitiile sipcilor care, ulterior, pot fi aplicate manual, relativ rapid. Dupa aceasta, elementul de perete este transportat pe asa zisa masa pentru ferestre unde se introduc ferestrele. In acest scop, masa se rabateaza la cca. 80° astfel incat ferestrele depozitate in pozitie verticala sa poata fi montate rapid si fara manevre suplimentare de intoarcere pe orizontala, folosind un sistem vacuumatic de manipulare. Aceasta masa speciala

ofera muncitorilor posibilitatea unei munci ergonomice. Dupa inglobarea ferestrelor, elementul este transportat spre alte 2 mese, pe care se poate face captusirea exterioara (indiferent de optiune). Pentru aceasta, avem la dispozitie o a doua punte multifunctionala care marcheaza cu exactitate pozitiile elementelor de captusire, reducand astfel la minim munca manuala. Mai departe, aceasta masina preia, alternand intre cele 2 mese, operatiile de fixare cu cuie a sipcilor si a lambriurilor de captusire exterioara precum si debitarea lor sub unghiul dorit. Si, in cele din urma, a fost dezvoltata, impreuna cu firma WEINMANN, o statie de incarcare speciala. Aici, elementele



Montajul ergonomic al ferestrelor / Ergonomic installation of window elements

finite sunt ridicate in pozitie verticala, cu ajutorul unei mese care le stivuieste apoi intr-o constructie speciala, pana la formarea unei stive cu latimea de cca. 1,2 m. Dupa o asigurare pentru transport si o ambalare corespunzatoare, aceasta stiva poate fi incarcata direct, cu ajutorul unui stivuitor cu furca. Linia noastra pentru elemente de acoperis si planseu este compusa din 2 mese cu axe NC, la care dispozitivele pentru fixarea grinzilor longitudinale, se deplaseaza, complet automat, in cateva secunde, exact in pozitiile transmise din baza de date. Operatorilor le revine apoi doar sarcina asezarii grinzilor pe pozitiile corespunzatoare si a imbinarii lor prin cuie. O alta punte multifunctionala are menirea de a aplica, complet automat si intr-un timp foarte scurt, adeziv pe suprafata grinzilor pe care apoi se aseaza elementele de placare. Fixarea cu cuie si debitarea placilor de placare respectiv a sipcilor se face apoi, deasemenea complet automat, cu ajutorul puntii multifunctionale. Si in acest loc de munca se desfasoara procese complete, intr-o alternanta permanenta intre cele 2 mese, astfel incat perso-

Performance: „What form will the production of your wall and roof elements take with the WEINMANN system?”

Haug: „The production line consists of wall production, as well as roof and floor production, and the external walls are produced at approx. 0.35 m/min. The first component in the system is a WEM 150 framing station, which works with standard lengths of raw wood for the belts and automatically cuts the lengths of wood to the correct length for a production order using nail plate presses and chop saws. The insulation is also inserted between the studs and the door and window modules are assembled, using a fully automated nogging station. Once work at the framing station is complete, the insulated frame work is transported automatic-

ally onto a table, aligned at right angles and sheathed with asphalt or plasterboard, depending on the customer's requirements. The elements are attached and cut fully automatically using a multifunction bridge (WMS 100), while the partly bent studs are simultaneously moved into the correct position via an additional NC axis. This guarantees that the element is as accurate as possible and that every nail is nailed securely into the wood, in order to guarantee the subsequent statics of the house. An inkjet printer on the multifunctional bridge marks the positions of laths, which can then be applied manually and relatively quickly at a later time. The wall element is then transported on what is known as the window table, on which the windows can be inserted. The table is positioned at an angle of around 80 degrees for this purpose, so that the window, which is delivered vertically, can be inserted quickly and without the need for additional rotation, with the aid of a vacuum handling system. This special table allows our employees to work in the correct ergonomic manner. Once the windows have been inserted, the element is transported to two further tables on which

the external insulating material (of any orientation) can be applied. A further multifunctional bridge is available for this purpose. It is equipped with a marking device which provides the exact position of the cladding and thus helps minimizing the manual work to a minimum. This machine also alternates between nailing the battens and cladding on both tables, as well as cutting them to the required angle. Finally, another special loading station was developed together with WEINMANN, where a table positions the finished elements and stacks them in a special device, until a stack of wall elements with a width of 1.2 m has been created. This stack can then be immediately loaded using a forklift truck, after applying the appropriate transport safety device and packaging. Our roof production and floor production consist of 2 NC axis tables. The clamps for the longitudinal beams on these tables adjust to the correct positions in a fully automated process and in just a few seconds, in accordance with the information in the data records. The machine operators just need to insert and nail the

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Formarea automată a stivelor de elemente de perete / Automatic stacking of wall elements

nalul nostru se completează perfect cu mașinile.

Rev. Performance: " Ce avantaje va confera această metodă de fabricație? "

DI. Haug: " Producem, în mod cert, calitate mai bună cu un aport de personal diminuat semnificativ. Pentru a putea atinge volumul de producție pe care ni l-am propus, respectiv 600 case pe an, fără linia WEINMANN, am fi avut nevoie de 46 de angajați, în timp ce, în actualele condiții, putem produce cu doar 9 angajați. Pentru intervalul 2010 – 2015 ne așteptăm la o creștere de 4 ori a cifrei noastre de afaceri. Din acest motiv, începând cu cel mai târziu luna mai a.c., vom organiza producția în 2 schimburi. După calculele mele, investiția în întreaga instalație se va amortiza în cel mult 3 ani.

Rev. Performance: " S-au operat modificări în organizarea întreprinderii? A avut noua instalație vreun impact asupra numărului de angajați? "

DI. Haug: " A avut loc o mutare semnificativă a activităților din hala de producție în zona de management: toate activitățile de planificare și concepție, incluzând elaborarea schițelor de proiect dar și corectarea și optimizarea lor, se fac acum de către proiectanți, adică de către acei angajați care au viziunea asupra întregului proiect de construcție. Compartimentele noastre administrative, cum ar fi cele de aprovizionare, vânzări și proiectare, au crescut, evident, proporțional cu volumul tot mai mare de comenzi, în timp ce numărul angajaților direct productivi s-a menținut același.

Rev. Performance: " La început, angajații au fost sceptici atunci când au aflat de achiziționarea instalației? "

DI. Haug: " Din contra. Angajații firmei Støren se mandresc cu faptul că lucrează pe o linie de fabricație ultramodernă. Investițiile făcute, în valoare de 10 milioane de Euro, defalcate pe ultimii 5 ani, ne-au permis să ne asigurăm toate locurile de muncă pentru următorii 10 ani.

Rev. Performance: " D-le Haug, va mulțumim pentru această discuție. "



Inaugurarea noii instalații în martie 2012. De la stg. la dr. : Roald Haug, Hansbert Ott, Tron Gulbrandsen
Inauguration of the new facility in March 2012. From left to right: Roald Haug, Hansbert Ott, Trond Gulbrandsen

beams accordingly. This enables an additional multifunction bridge to apply adhesive to the frame in a fully automated process and within a few minutes, onto which the sheathing can then be laid. The board layer and the battens are then nailed and cut again in another fully automated process, using the multifunction bridge. Even in this workplace, all processes are carried out while constantly switching between the two tables, meaning our staff and the machines complement each other perfectly."

Performance: „What advantages does this production method offer you?”

Haug: „We produce markedly better quality and are able to do so with considerably fewer staff! In order to achieve our target production volume of 600 houses per year, we would require 46 employees if we were not working with the WEINMANN system, whereas now we are able to produce houses with just nine members of staff. Between 2010 and 2015, we expect our turnover to quadruple. We will therefore reorganize production to a two-shift operation, with effect from May this year at the latest. I anticipate that the investment in the plant will have paid for itself in three



Pachetul cu elemente de perete, ambalat pentru livrare
Stacked wall element package ready for shipping

years or less."

Performance: „Have changes therefore been made to the operating process? Has the new plant had an impact on the number of people your company employs?”

Haug: „There was a significant shift in operating processes from the factory floor to management: All planning and construction processes, including drawing up, correcting and optimizing construction plans, are now carried out by the planners — those employees who have an overall view of the construction project. Administrative divisions, such as our purchasing, sales and construction departments, have of course grown in proportion with the increased order volume, but the number of employees within production has not increased."

Performance: „Were the employees initially skeptical when they found out about the purchase of the system?”

Haug: „It was actually the opposite. The employees at Støren are proud to be working with an ultra-modern production system. The investments we have made over the last five years, totaling around EUR 10 million, have enabled us to safeguard all jobs for the next ten years."