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EDGE MACHINING BY „MAKOR" SYSTEM – THE WAY TO RAISING EDGE QUALITY

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Abstract

Particle boards as well as slats or MDF boards are taped to make them more attractive. It concerns for example skirting boards made from pine wood but imitating much more expensive kinds of wood by coating them with veneers or foils. Board edges are also often coated in order not to show the cross-section of particle board. Special equipment ,specially designed for this purpose, unites a serious of machining operations together with lacquering or edge coating and filling. The example of such equipment is edge coater "GEMINI" produced by Makor and showed during International Fair of Poznań – Drema 2012.

Key words: *GEMINI, MAKOR edge, quality, coating*

INTRODUCTION

Edges of particle boards and slats are produced for different purposes. They decide to some extend about the final look of a product. This is the case of skirting boards, furniture slats, slates used for frames, slats used as parts of casing, components of door parts and so forth. Identically they decide about outlook of boards determining their finishing. This is the reason why work on creating new materials for coating and new technologies is constantly carried on(like for example coating of narrow edges and coating of narrow slats).

In some cases undercoat materials like some kinds of wood and MDF boards need smoothing so that the human eye didn`t notice the roughness under boarders and coated tape. It concerns especially thin slats that is why they are being replaced by thick ones. This is a current tendency in world furniture design where 3D [4,5] boarding is introduced. Such tendency is also noticed in picture frame production. Many frame designs are inspired by Italian style which introduces unique climate to pictures or reproductions [3,7].

Special decorative foils thanks to which it is possible to obtain effects of gold-plating, silver-plating, ageing of surface or change of wood type. The only requirement is smooth surface. [1,2,4,5, 6,10]

Fig. 1. MDF slat coated with veneer

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EQUIPMENT FOR EDGE - COMPLETE PROCESSING SOLUTION

Many firms in Europe produce equipment for edge machining like for example PAOMACC, TOMANIN, ELMAG, MAKOR and so forth. During Ligna 2011 one of them MAKOR presented new model of *GEMINI* product for double-sided UV filling on board edges (especially particle board and MDF board). The same model was also presented during DREMA 2012 A special head (patented by MAKOR) was designed to coat a board edge coat hardened by UV radiation. Edges protected in such way let subsequent machining. New GEMINI is designed for producers who want to produce lacquered panels from particle boards or MDF boards. So far they were forced to use MDF boards (because of higher density) which enabled preparing edges for lacquering. Introducing MAKOR technology producers can substitute MDF board by particle board which results in final product cost reduction as well as weight reduction. For producers producing furniture from laminated boards fully filled particle board edge lets precise coating which are earlier machined by dimension saws or by CNCs.

New MAKOR solution enables prepare well base for lamination and coating with foils of the best quality .Well coated and lacquered particle board edge is also an alternative to PCV edge coating.

So far all GEMINI models have been automatic, multifunctional machines for one side machining of edges. The new model can machine mutually two facing edges. Elements machined on consecutive modules are exposed to full finishing process during one go.

Transport of elements takes place on one wide caterpillar and upper pressure guarantees that transportation proceeds smoothly. Proper selection of type and number of sanding aggregates enables machining of both flat and profiled edges. For edge lacquering special vacuum heads are used which reflect machined profile. Instead of a head it is possible to use roll for flat edges however usage of a head gives wider possibilities especially when edges have more complicated profiles. This innovative technology is more and more demanded especially as it is environment friendly (does not emit harmful substances). Substance excess is 100% regained and reused.

Currently in Poland this model of Gemini edgecoater is working at the biggest producers of door producing door for IKEA or producers of high quality furniture for bathrooms.

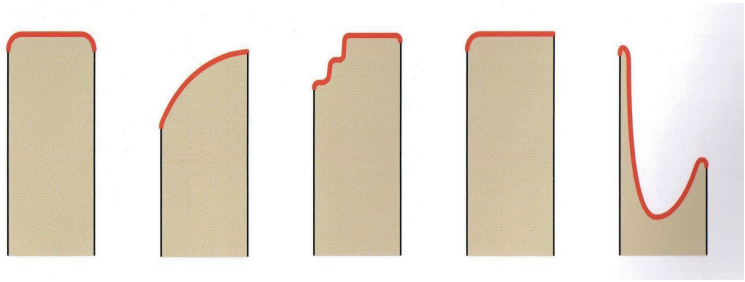

Fig.2. Examples of board edges lacquered by „GEMINI" ltest model.

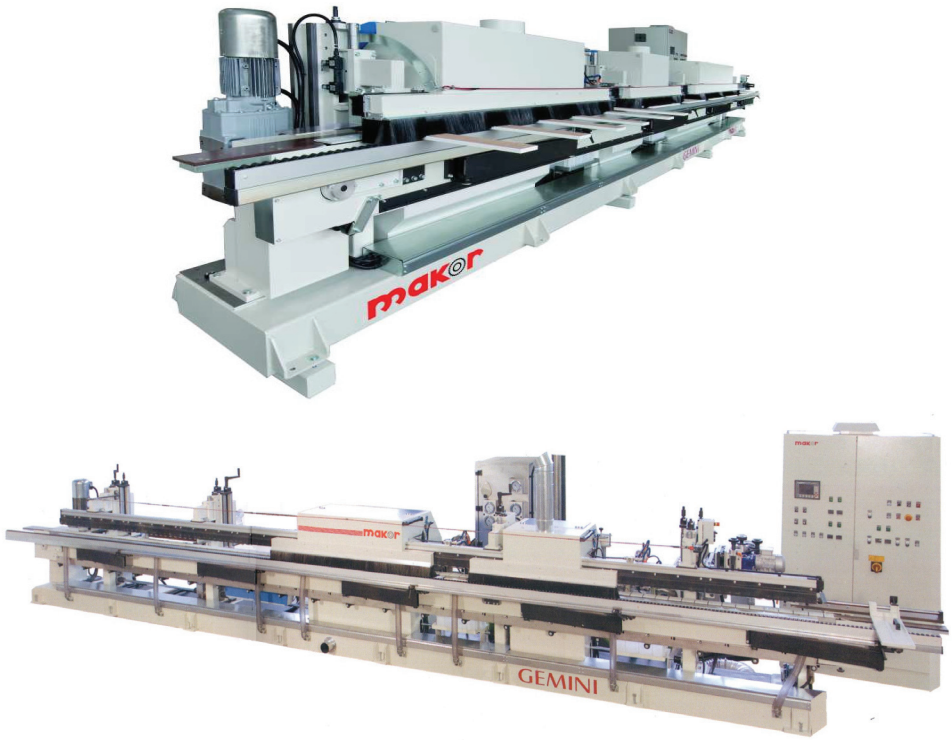

Fig. 3. The newest model of GEMINI edgecoater

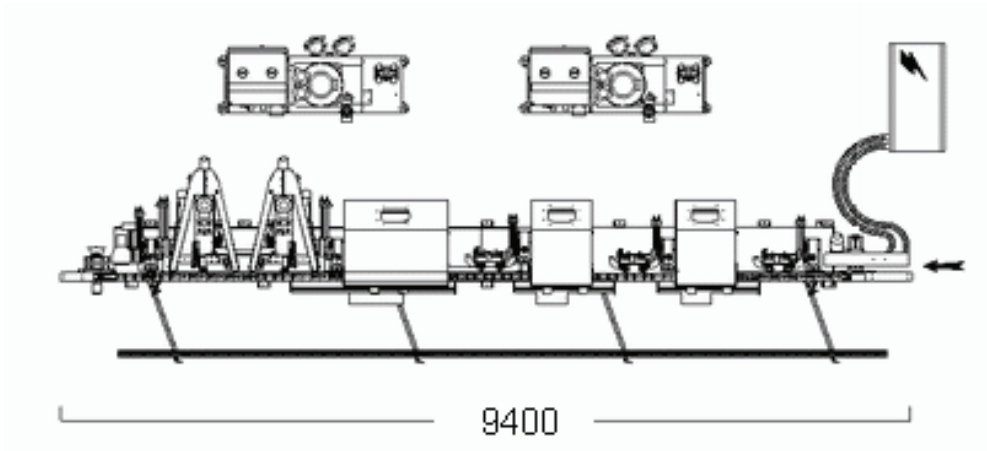

Fig. 4. Edgecoater *GEMINI*

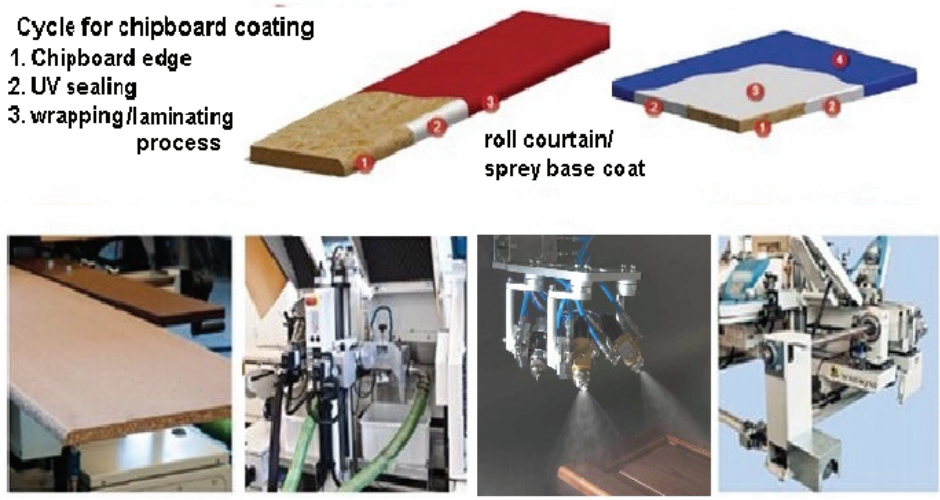

Fig. 5. Cycle for chipboard coating

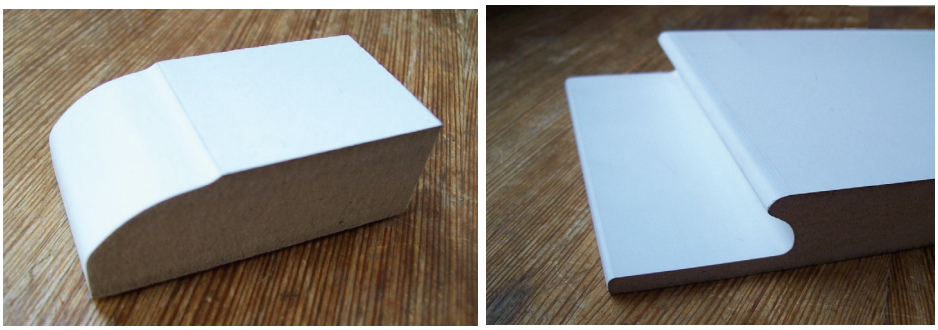

Fig.6. Different lacquered profiles of MDF board

METHODS AND RESULTS

To properly determine improvement of surface quality some operations of colourless lacquer varnishing on earlier milled surface were performed. The particle board treated in such way was assorted specially to have almost the same density on the cross-section. On the basis of organoleptic treatment one can at once notice substantial difference between surfaces of both edges.

That is why continued coating with foils or taping with decorative tapes eliminates the effect of roughness on edges. To illustrate the difference in surface roughness, surface roughness was measured on narrow cross-sections of particle board before and after lacquering.

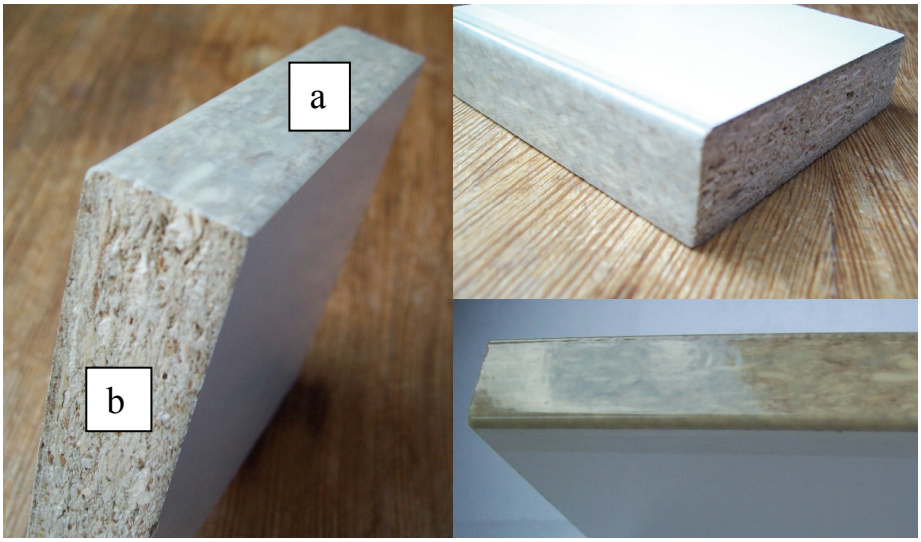

Fig.7 . Particle board with one edge lacquered with colourless lacquer.
Edge after; a) milling and lacquering , b) milling

The data obtained are shown as profilogrames on Fig.8-11. They were performed using stylus profilographomometer in which the measuring stylus had rounding radius equal 0.1 mm and angle 90^0.
The data show that lacquered surfaces let coating with thin foils on surfaces of for example picture frames [3,7,8,9] especially imitating gold or silver not visualizing any defects arising as a result of production process that is scratches, discoloration, roughness, indentations and cavities and so forth.[12,13].

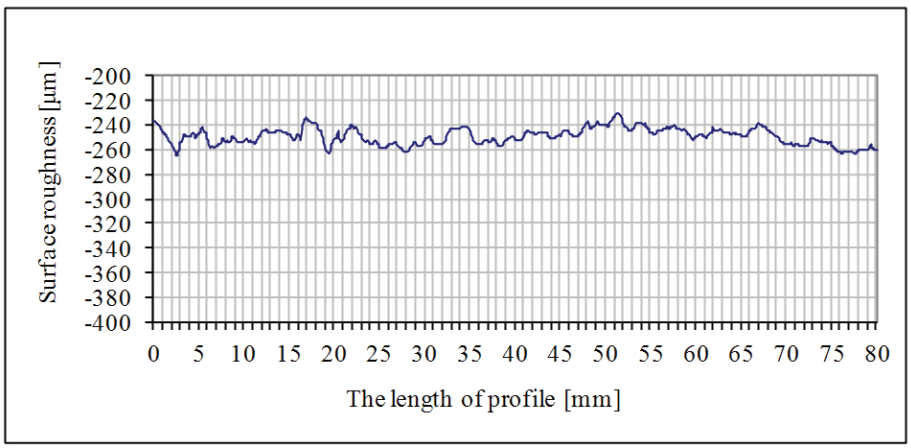

Fig. 8. Prophilogram of edge surface of particle board laquered by GEMINI equipment

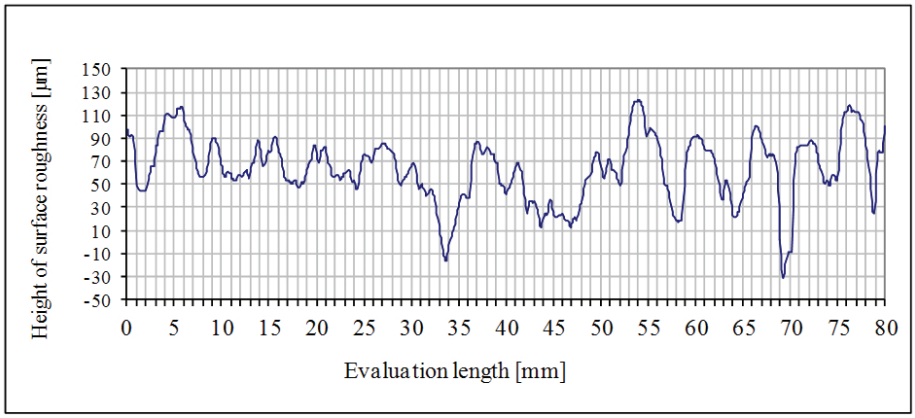

Fig.9. Prophilogram of edge surface of particle board non laquered

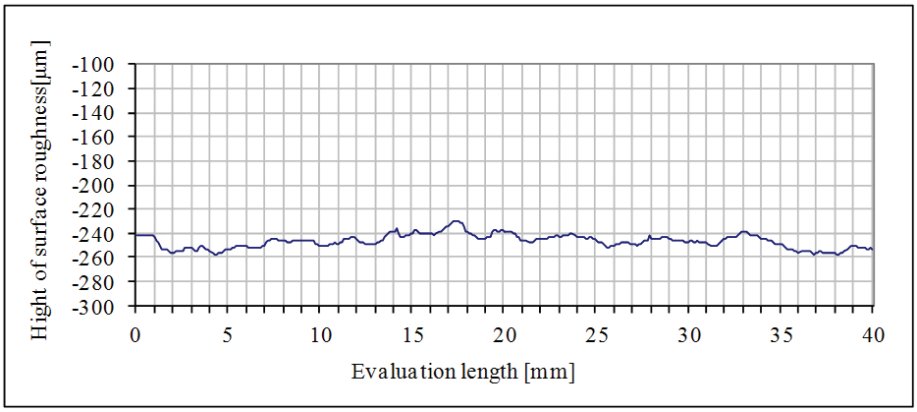

Fig.10. Prophilogram of edge surface of MDF board laquered by GEMINI equipment

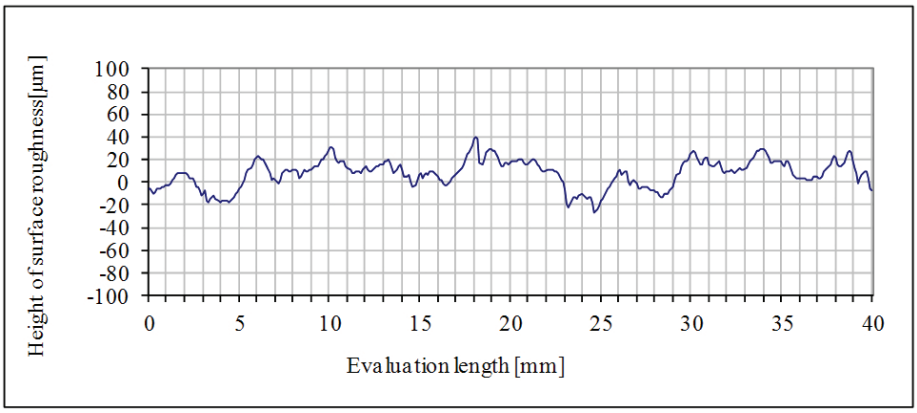

Fig.11. Prophilogram of edge surface of MDF board non laquered

Equipment for edge - complete processing solution influence the final preparation of boards for edge finishing and also slats for foil coating; especially those which are used in direct proximity of human being.

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