CROSSLINKING AB

# EBC for non-thermal curing of lacquers on boards, doors, panels and parquet

Today the consumer is searching for surfaces with the resistance and the durability of synthetic materials, but he doesn't want to lose the warmth and the homeliness, which lacquers are transmitting at the same time.

For this the EBC (Electron-Beam-Curing) presents lacquered surfaces highly crosslinked, which can't be reached economical with any other lacquering technology.

Why EBC ?

Additional to the above important arguments for the EBC-drying there are some essential advantages of this economical curing method to the fore:

- Solvent free, 100 %-system, curing through polymerisation
- High scuff resistant coatings
- Controlled and calculable through-curing
- Immediately stacking or subsequent treatment of the materials
- High throughput, essential increasing of the production speed in comparison to the thermal drying method
- Constant product quality, precisely maintain of crosslinking and vulcanising process through dose precision over working width, in the depth of material and also in production time
- Essential modest extraction values in comparison to UV-curing, processing without sensitises
- Modest energy consumption, minimal temperature increase through radiation process
- No change of moisture level in the substrate

EBC is successful in the industrial practice of surface converting for a variety of substrates, e.g:

- Wood materials (floor coverings, doors, wall plates, all-around curing of lacquers on mouldings)
- Façade plates for outside application, direct coatings of paper and foils
- Paper and synthetic foil coatings (furniture foils, lacquered foils for laminated boards in application for high requests like floor coverings or table surfaces)
- Vulcanising of pressure sensitive adhesives



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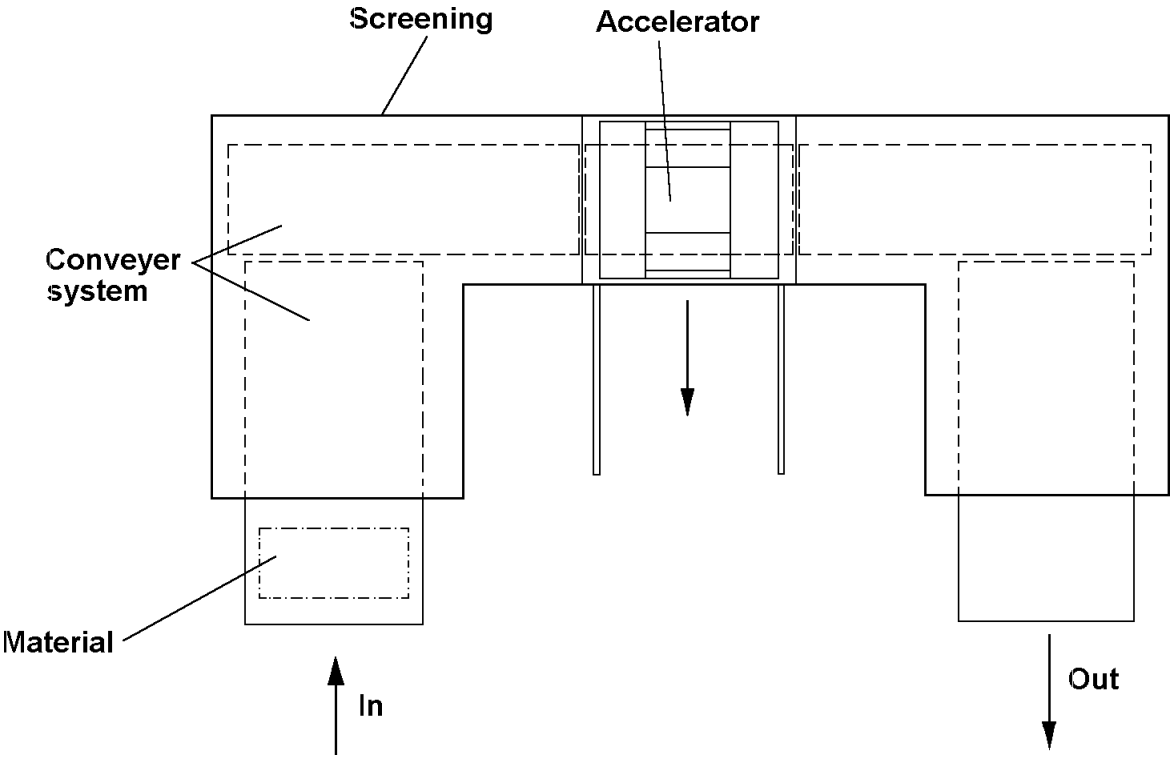
Lacquer material

The EBC curable layers, consists of 100 5 systems on acrylate base. With corresponding pigmentations of differently colours and with particularity considerations all matting levels and also structures in the surface can be reached.
All available systems like roller coating, curtain, vacuumat application, dip and drain coating, spray coating can be used as application technologies.
EB-lacquers have a very low steam pressure, therefore the application with increased temperatures of the coating material and / or the substrate is possible. Also there is no drying of the lacquers in the application systems. An ex-protection is inapplicable.

The cured layers gives the feeling o lacquers with its own warmth and homeliness. Also they are resistant to scratches, nicks, acetone, ethanol, water, acids, fat, coffee, wind and weather.

EBC board plants are easy in construction; for the operation there is no additional personnel necessary. The plants are running independent SPS-controlled and screen supervised. Because high voltage (penetration depth of electrons) and electron beam (dose / throughput of material) are measurable and calculable values, everytime and for every product a quality with EBC is possible.



Drying process

On a conveyor (see the following drawing) the coated boards are coming to the x-ray shielding. They will be transported to a second level to avoid x-ray emission.
Than they come to the inertisation- and curing zone with accelerate electrons. Through polymerisation the liquid coating the liquid coating material will be changed into a hard layer, with previous described qualities, in parts of a second. The board with a cured layer leaves the curing zone and reaches the working level inside the lead shielding and can be controlled, packaged, spreaded further or turned for coating the back side immediately.

EBC is economical

After fixing the requests of the coating, the layer thickness (acceleration voltage) and the planned throughput of the material (electron flow) will be well suited to each other. The economical area for plants is, according to the increase in value of the converting process, between 0,5 and 5 Mio. $m^2$.

Extensive cost analysis shoes, that in consideration to the whole coating process, with sanding, basecoating, intermediate sanding and even a multilayer coating with UV-intermediate gelling and EBC-end through curing, approx. 70 % of the coating costs are caused due to the lacquer. The rest of 30 % is spreaded in energy, inertgas, service, articles of consumption like sanding paper, and also capital and deprecation costs.

According to the lacquer costs, realistic $m^2$-costs, at a total coating weight of 150 $g/m^2$ are in the area of 2,60 $DM/m^2$.

Performance data for Electron Crosslinking AB Accelerators

| | |
|---|---|
| - Acceleration voltage | 80 - 300 kV |
| - Electron flow per cathode | max. 200 mA |
| - Working width | 200 - 2000 mm |
| - Electron flow per cm window length | max: 3,2 mA/cm |
| - Distribution of dosage over working width | better ± 5 % |

- Productive penetration depth of electrons max. 390 g/m$^2$
-also in pigments or metals-

No gas cooling of the electron exit window necessary
The electron accelerator can be installed in all positions
No measurable radiation outside the x-ray shielding

Discussions of process or principle trials direct to the developer and manufacturer of electron radiation systems:

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