



Drying Specialty Papers

drying specialty papers
and barrier coatings

Drying specialty papers and their coating can be very tricky, as specialty papers often have a closed surface, making it more difficult to evaporate the water trapped either inside the substrate or in the coating.

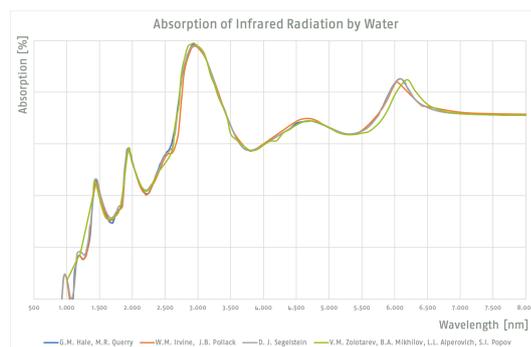
It is of highest importance to dry the paper and coating from inside out – starting at the initial sedimentation layer and prevent **premature film formation** on the surface.

This can be done at very slow speed either using hot air dryers, with a slow drying curve – or requiring big space.

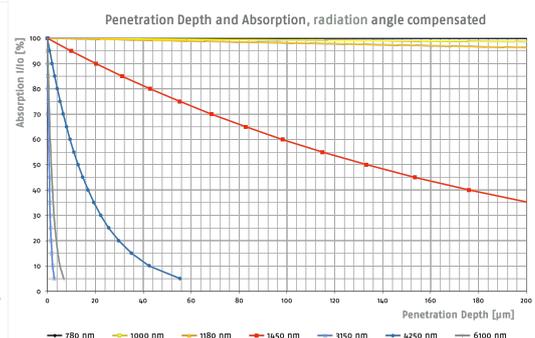
Gas fired infrared dryers predominantly heat the top 5 µm and lead thus to premature film formation, the main cause of blistering, thus are not suitable for drying barriers.

Standard electrical infrared emitters waste energy in a spectrum which isn't absorbed by the hydrogen bonds and lack the capacity of evaporating the water while still heating the coating or substrate.

Compacts XenTec dryers have their peak output at 1.45 µm wavelength where hydrogen bonds exhibit high absorption, and where the radiation penetrates deep into the substrate. This allows starting drying the barrier at the initial sedimentation layer, successfully preventing blistering. XenTec Dryers start evaporating the water while heating it, cooling down the coating preventing premature cross-linking allowing an improved mass flow towards the surface.



Absorption of infrared radiation by hydrogen bonds



Penetration depth of infrared radiation of different wavelength into water

Besides **significantly higher evaporation rates**, the concept of the XenTec dryers delivers **improved paper properties**, as **micro-blistering** is avoided.

The coating starts drying at the initial sedimentation layer, and a film is only formed when the coating is devoid of water, i.e. fully dried.

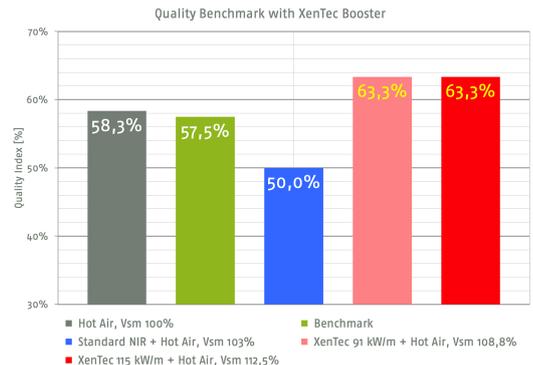
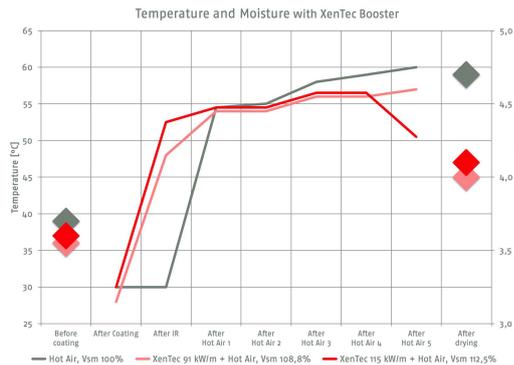




Barrier Coating Drying

XenTec Apollo as booster increasing production speed

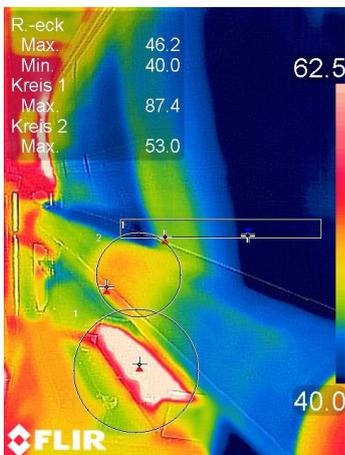
The drying capacity of a coater is limited, and capacity increase through speed increase can't be achieved by adding long hot air hoods due to lack of space.



Lower temperature despite significant speed increase *Improved quality due to immediate evaporation*

XenTec Apollo is installed between coater and hot air hood within 60 cm space in machine direction.

- Significant speed increase on the key grades with very little power requirement,
- Cooler sheet at the end of the hot air dryer through improved evaporation starting already in the XenTec Apollo,
- Significant lower moisture, leaving ample room for further speed increases,
- improved paper properties as the barrier starts drying on the initial sedimentation layer, and blistering is avoided



Barrier Coating Drying

XenTec Apollo as booster increasing production speed

Insufficient drying capacity after film press. A XenTec Apollo is installed between air-turn and after dryers for evaluating impact on drying capacity and paper quality.

- At 50% power the desired increase in drying capacity is achieved,
- The sheet is slightly heated from 40°C to 55°C, and cools down to 46°C in less than a meter space,
- Coating is dried from inside out, and allows full evaporation of the water before surface closes;
- XenTec Apollo boost the drying capacity of the after dryers, as water is flowing in z-direction towards the surface, easing the task of the drying cans.

represented in D A CH by:

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