

### CLEAN QUALITY SUBSTRATES ANYONE?

Anyone printing and coating has to be interested in quality and anyone interested in quality has to be interested in clean quality substrates. What's meant by clean quality substrates?

Cleanliness is a large factor in printing and coating with regard to the causation of hickeys (in printing, unwanted specks, surrounded by an unprinted halo caused by foreign material, dirt, hardened ink or other matter displacing ink in the transferred image print area). Hickeys, when detected, cause press shutdowns, waste stock as compromised quality prints are discarded, and result in time consuming wash-ups.

Quality in substrates typically goes beyond cleanliness and takes into account other factors that affect press runnability. These include smoothness, dimensional stability in terms of freedom from shrinking, warping and an absence of other objectionable defects.

Many different varieties of substrates are being used today to satisfy the requirements of print customers. Not only do we continue to see high demand for traditional coated and uncoated paper and paperboard substrates including SBS, C1S, C2S, SUS, and clay coated news, but also recycled and specialized substrates. These can include substrates with special properties provided by double and triple coatings, barrier coatings, corona treatment, 90+ brightness levels, and metallized film lamination.

A variety of synthetic substrates are also being provided the printer. Clay coated films are available that make films feel and act like paper. Certain of these very smooth cast films perform with high quality for the printer. Calcium carbonate reinforced polypropylene films are also offered as high performance print substrates. High density polyethylene (HDPE) is another plastic synthetic substrate that is available in single ply or in multi-plys, which can be clay coated for improved printability.

High visibility reflective metallized papers and films are producing eye catching high quality graphics for today's print markets. Laminated to board, these metallized substrates provide the "look". Surface coatings allow these metallized plastic films to exhibit excellent print acceptance properties.

When we consider paper and paperboard substrates, the producing paper mill has a direct influence on printing press performance. On press quality issues such as poor ink coverage, holdout and mottle frequently can be related to paper smoothness or better put, the lack of. Smoothness is produced by the mechanical processing or repeated ironing of the web. Simply, the more a mill irons the web the smoother the end result. Mill terms for the ironing process can include dry or wet stacking and calendaring. In practice, a wet stack adds moisture to the web after the hot press section has removed excess water. This is done in order to allow effective ironing to occur. Further smoothing is accomplished by use of dry stack ironing after wet stack ironing. Extended nip techniques, used in the paper making process prior to web drying and ironing, also contribute to smoothness.

Seeking maximum smoothness, a paper mills' final finishing processes can utilize hot and soft calendaring (better) or gloss calendaring techniques.

Smoothness is also a product of coatings applied to C1S and C2S substrates. Typical clay coating formulations are applied by either air-knife or blade-knife processes. The blade-knife technique is thought to produce the smoother surface because it applies an even level coating layer regardless of the webs smoothness. The air-knife coating process, on the other hand, simply follows the surface of the web undulating over any hills and valleys.

Many variations in clay coating formulations are used by the various paper mills with viscosity, strong binders and high solids thought to be of leading importance.

OVER

Poor coating processing can produce coated substrates with surface scratch and streak defects, or unevenness that compromises subsequent printing and top coating.

Dimensional stability is important since a paper sheet that wants to warp or shrink is a nightmare to print on effectively. A smooth, stable and printable sheet results from a proper blend of short and long wood fibers. Long fibers produce a strong, stable but rough sheet while short fibers produce a weaker but much smoother sheet.

Moisture content, and non-uniform moisture content, can also affect dimensional stability and has to be controlled at the mill in production and in subsequent storage.

Assuming that you're dealing with a clean mill, and there are clean mills and cleaner mills, you should be able to obtain a consistent supply of debris free stock.

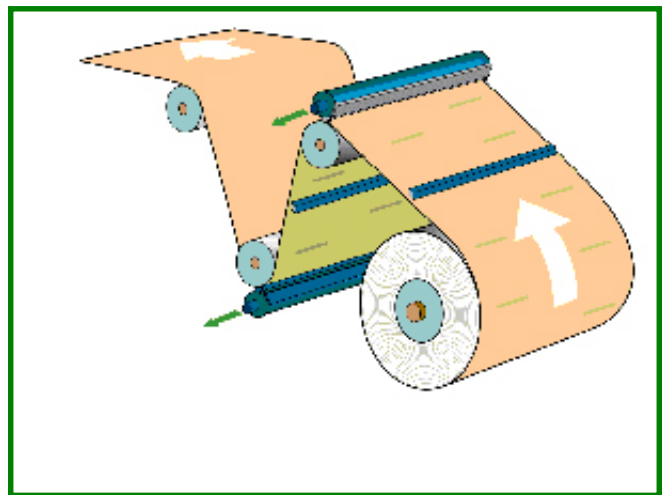
The overall benefits of running a clean sheet has lead many printers to install cleaning systems on sheeters and all variety of presses.

Plants that have adopted cleaning systems generally report much improved reductions in rejected and wasted printed stock resulting from hickeys and time consuming wash-ups. Less downtime for wash-ups also results in the ability to maintain better color consistency and improve productivity, not to mention overall quality.

A clean substrate not only leads to benefits in the quality of printing, but also in the quality of overcoating. Whether one is aqueous coating, UV coating or EB coating, none will cover and hide defects in printing. Debris of any sort will show up as distinct visual defect points as the thin coating film forms tent like over a debris particle.

Available cleaning systems vary in approach. Some utilize stationary brushes, others rotating brushes to loosen debris. There are both contact and non-contact systems offered. All loose particles and embedded

material can be removed and collected. High and/or low velocity air flows, usually combined with vacuum, are used to remove and collect debris. Both single and two side cleaning systems are made to clean the entire surface and edges of a substrate. Units mounted on printing presses can effectively lift and remove debris providing a clean sheet or web for printing.



Remember, when considering the cleanliness of substrates, clean substrates lead to improvements in print quality, more consistent color and reduced contamination of ink trains, dampers, blankets and plates.

Further, and taking it a step farther, clean substrates and quality printing provide the required foundation necessary for eye catching top coating results.

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