

Why is linting associated with offset printing?

Direct contact of paper with the rubbery surface of the blanket, combined with the higher tackiness of inks, exerts a significant amount of stress on the surface of the paper in the nip of the printing press. The introduction of four-color offset technology made linting related problems more troublesome. Due to the higher tackiness of the offset printing inks, offset printing is much more susceptible to linting problems than the rotogravure or letterpress processes.

What causes linting?

The mechanism of linting is still not well understood. Various types of linting, including image area linting, non-image area lint, dusting, and tension band linting have different origins, as discussed later. In general, linting is caused by one or more of the following:

- Pulp quality
- Papermaking operations
- Printing conditions

Surfaces with low linting properties are typically smooth and well consolidated. However, particles found in a typical lint sample are poorly bonded. These observations tell us a lot about the origins of lint and possible available remedies.

Is there lint-free newsprint paper?

No, a certain amount of lint accumulation always takes place. Linting appears to be a dynamic process, with the initial rate of accumulation decreasing until a certain equilibrium is reached. The

question revolves around whether the total accumulation at any time in the printing process is high enough to cause unacceptable deterioration of the image quality. This depends on the lint accumulation rate and run length, both defining maximum lint accumulation in the equilibrium stage.

Is all lint the same?

No. Lint deposits on the press blanket can be divided into the following categories:

- Image area lint
- Non-image area lint
- Tension band lint

What is the composition of these different lint types?

Image area lint directly impacts the quality of the printed image on paper. This is a reason why this kind of linting receives the most attention. A fibrous fraction of lint in the image area contains unfibrillated fibers of varying lengths. If properly refined Kraft fiber is used in the furnish, it is very unlikely to find it in the collected lint sample. With the shift toward using refiner types of pulps (TMP, RMP), the amount of small particles in the lint increased. The majority of these small particles are ray cells that are produced at a higher level in refiner mechanical pulping than in SGW or PGW. It seems that the grinding process (SGW, PGW) utilizes the applied energy more efficiently than the refining process and provides better developed fibers, especially those of shorter length. Typically, all lint material found in the image area is less than one millimeter in length, and according to some sources, 90 percent is below 0.3 millimeters.

The nature of lint in the four-color printing process may be different from one color station to another. Typically, from the first to the last color station, the composition of image area lint changes from predominantly ray cells, to short fiber fragments to thicker, short fibers.

Non-image area lint, in some cases, can be significantly greater than the image area lint. It is often associated with the interaction between the paper and fountain solution. The amount of the non-image area lint for the same paper may differ significantly between press-rooms. The material deposited in the non-image area consists almost exclusively of fine particles. The non-image area lint in excessive amounts can increase nip pressure and damage printing blankets. Non-image area lint can also affect print quality if deposit flakes off from non-image area and deposits in the image area.

Dust represents the loose material generated during the papermaking process. This dust can be entrapped during winding or through poor slitter conditions. Dust is strictly a maintenance and housekeeping problem.

Tension band lint is formed in the image area in the pattern corresponding to tension band contact. This type of lint is observed mainly in the press rooms using metallic belts.