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Standard Terminology Relating to Print Problems¹

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1. Scope

1.1 This terminology standard gives definitions for problems that develop with printed matter as a result of deficiencies in the ink, substrate, press, or combinations thereof.

1.2 The definitions cover the three major printing processes and are given in the following sequence: lithography, flexography, and gravure. For further information see Refs (1-4) at the end of this standard.

2. Significance and Use

2.1 A common set of definitions is essential to improve communication and avoid misunderstanding among ink makers, paper makers, and printers.

2.2 The term “paper” in this standard also encompasses the term “paperboard”.

2.3 Definitions that are verbatim from one of the referenced sources are indicated by giving the acronym of the organization at the end of the definition.

3. Terminology

3.1 Definitions:

3.1.1 Lithographic Printing:

blistering, *n*—the formation of small air pockets under the printed paper surface.

DISCUSSION—It results from moisture being trapped under the dried ink film during heatset drying. This condition is more common with higher ink coverage and heavier basis weight papers.

blocking, *adv*—an undesired adhesion between sheets of printed material that might occur under moderate pressure or increased temperature, or both, while in storage or in use.

DISCUSSION—Damage to one or both surfaces may be visible upon separation and may be due to improperly dried ink or coating.

catch up, *n*—a condition that occurs when the non-image area of the plate becomes ink receptive. See **scum**. [GATF].

DISCUSSION—This condition results from the insufficient feeding of dampening solution.

coating pick, *n*—the removal of coating particles from the sheet surface that occurs when the tack of the ink exceeds the surface strength of the substrate.

DISCUSSION—A loss in surface strength may occur during printing when the coating is resolubilized by the fountain solution.

dot distortion, *n*—an undesired change in shape of halftone dots during plate making or printing operations, or both.

dot doubling, *n*—the unintentional printing of two images slightly out of register from a single form.

DISCUSSION—Dot doublings can be the result of a mechanical problem due to undesired movement between the plate and the blanket.

dot gain, *n*—the increase in halftone dot size in relation to the dots on the lithographic film; it is the arithmetic difference between the dot area on the original film and dot area on the printed sheet.

DISCUSSION—Physical dot gain can be caused by a number of the processing steps in prepress or during actual printing. Factors that control dot gain on press are ink film thickness, amount of water feed, solid print density, ink holdout/absorbance characteristics of the paper, screen ruling, blanket release, pressure between the blanket and plate, and pressure between the blanket and paper. Optical dot gain results from light scattering in the paper. The dot gain value can be determined using a dosimeter that calculates the apparent dot size on the print as compared with the original dot size based on the density of the solid.

dot loss, *n*—the total or partial loss of the smallest dots on the sheets, usually in the areas of 25 % screen or less.

DISCUSSION—Dot loss can be due to plate or blanket buildup caused by an undesired reaction between the paper and fountain solution. (Also referred to as disappearing dot or vanishing dot.)

dot slur, *n*—dot gain that occurs in a pronounced direction and is not symmetrical.

DISCUSSION—Slur is caused by mechanical problems with the drive and speed of the plate and blanket cylinders.

embossing, *n*—the tendency of a paper to take a permanent pattern, either depressed or raised, as a result of contact with the blanket during printing. [TAPPI]

fiber pick, *n*—the delaminating, splitting, or tearing of paper surface fibers that occurs when the force between the paper and blanket exceeds the surface strength of the paper.

ghosting, *chemical*, *n*—the appearance of gloss or dull mirror images that are printed on the reverse side of the sheet.

¹ These test methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications, and is the direct responsibility of Subcommittee D01.56 on Printing Inks.

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DISCUSSION—This phenomenon is usually caused by chemical activity of the ink during the drying phase of oxidative inks.

ghosting, mechanical, n—the appearance of a phantom image on the printed side of the sheet.

DISCUSSION—These images can be caused by some mechanical factor in plate preparation, press settings or mechanical problems.

ghosting, starvation, n—mechanical ghosting that appears in solids and shadows as either a lighter image or a darker image than the background.

DISCUSSION—The basic cause is a layout that is too demanding for the inking capacity of the particular press.

(a) *light print ghosting*: a lighter image within the primary image. Light ghosts are defects in a print solid after other solids (for example, large letters) strip too much ink off the form rollers. This occurs when the other solids are next to the gripper edge, between it and the defective solid.

(b) *dark print ghosting*: a darker image within the primary image. Dark ghosts result, for example, from reverse block letters near the gripper edge in a defective solid because the reverse leaves excess ink on the form rollers; the ghosts are further away from the gripper edge than the reverse.

hickey, n—an imperfection caused by dirt, hardened ink, paper debris or other unwanted particles that cling to the press or plate during printing.

DISCUSSION—Hickeys appear as either small solid printed areas surrounded by a white halo or as unprinted spots surrounded by printed ink.

hickey, halo, n—a doughnut shaped hickey with an inked center, often caused by foreign particles such as ink skin. [TAPPI]

hickey, void, n—a totally un-inked spot on the printed sheet, often caused by dust or pick-outs that adhere to the offset blanket or plate, thereby interfering with transfer of ink.

ink over-emulsification, n—a condition that occurs when a lithographic ink picks up too much dampening solution resulting in a weak print or snowflake pattern.

ink misting, n—the ejection of fine particles of ink into the air and onto the press, occurring when the ink film splits in more than one place. The centrifugal forces generated by high speed rollers can cause this problem.

DISCUSSION—Long inks are more susceptible to misting than short inks.

ink refusal, n—the failure of a roller or plate to accept ink. Alternative term: *stripping*—see *Gravure Printing*.

DISCUSSION—The condition can be caused by gum buildup on the roller or plate in the image areas.

ink setoff, n—the undesirable transfer of an ink in any printing process from fresh prints to any other surface.

DISCUSSION—This printing defect is caused by slow setting inks or insufficient spray powder.

marking, n—the removal of printed ink from the web to idler rolls, turn bars, or nose cone on a printing press.

DISCUSSION—Printing ink may then be redeposited on subsequent printed sheets.

milking, n—a white colored buildup on the non-image areas of the offset blanket that usually occurs when the paper coating or paper filler (in the case of uncoated paper) softens due to inadequate water resistance.

moiré, n—an undesirable, unintended interference pattern caused by the out-of-register overlap of two or more regular patterns such as dots or lines.

DISCUSSION—In process color printing, screen angles are selected to minimize this pattern. If the angles are not correct, an objectionable effect may be produced.

mottle, back trap, n—a nonuniform density variation of a printed ink film due to nonuniform ink absorption into the paper.

DISCUSSION—This results in nonuniform transfer of the ink back onto the blankets of subsequent printing units of the press, which in turn is transferred onto the following sheets (or web) of paper.

mottle, halftone, n—a nonuniform transfer of halftone dots.

DISCUSSION—This condition can be caused by factors such as irregularities in paper surface, variations in ink transfer properties or emulsified ink.

mottle, print, n—an uneven appearance within the continuous ink film solid areas of a print, with respect to density, gloss or color. Also referred to as “solid area mottle”.

DISCUSSION—This effect may be caused by a varying ink film due to the uneven ink receptivity and absorbency of the paper or by poorly ground ink.

mottle, trapping, n—nonuniform print due to improper tack sequence of the inks.

DISCUSSION—If the first down ink is lower in tack on the substrate’s surface, subsequent ink film(s) will not trap uniformly. In this situation, it is not uncommon for the first down color to also be pulled off the printing substrate onto downline units causing poor density and ink color contamination.

mottle, water interference, n—nonuniform print caused by poor ink transfer due to the printing substrates’ inability to absorb fountain solution.

paper linting, n—the picking off of loosely bonded paper surface fibers, or dust, or both, that can accumulate on an offset plate or blanket interfering with print quality.

DISCUSSION—This condition is usually associated with uncoated paper.

piling, n—a buildup of paper, ink or coating on the offset blanket, plate or rollers in such a quantity that it interferes with print quality. [GATF]

plate binding, n—the refusal of part of a lithographic plate to produce an image due to loss of ink receptivity.

DISCUSSION—This condition is caused by excess hydrophilic material such as gum.

plate wear blinding, n—the failure of the litho plate to print due to erosion in the image area.

plate scumming, n—the deposit of ink on the non-image area of the plate that can be in the form of minute particles or larger continuous solids.