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## WATERMARKS

### What is a watermark?

A watermark is a pattern made in high-quality papers by means of a raised or indented design that comes in contact with the paper when it is approximately 90% water and 10% fibers. The watermark designs are spaced at specific intervals (depending on the frequency of appearance required in the finished sheet) along the surface of a skillfully crafted wire roll called a “Dandy roll”. As the revolving Dandy roll comes in contact with the fibers, the raised or indented designs displace the fibers which produces the pattern visible in the finished sheet known as a watermark.

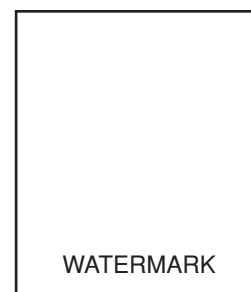
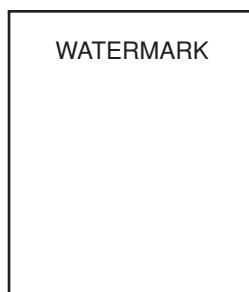
### Types of Watermarks:

**Wire Marks:** This design consists of fine wires soldered to the surface of the Dandy roll cover. While the paper is still being formed, the stock passes under the Dandy roll and the design displaces some of the fibers to form the watermark pattern. As a result, the paper is more translucent in this area and the watermark appears lighter than its surrounding area. For technical reasons, it is necessary to construct Dandy rolls used for watermarking the heavier bond papers slightly different than those used for watermarking onion skin papers. Therefore, it is not possible to secure on Dandy roll - with the same design - for watermarking both bonds and onion skins. Two separate rolls are required.

**Shaded Marks:** This type of design is depressed into the cover of the Dandy roll similar to “reverse” engraving. As the Dandy roll presses on the paper being formed, compression occurs everywhere but in the cutout design. Fibers accumulate more heavily in this depressed area, which results in a watermark pattern slightly darker than its surrounding area with a pronounced embossed appearance. In order for the fibers to accumulate in the detailed cutout areas of the design, certain manufacturing refinements are necessary that can sometimes affect the strength, formation or degree of obtainable cockle. It is also possible to furnish watermarks that are a combination of both the wire and shaded styles.

### Location of Watermarks:

**Random Marks:** The most economical way to produce your watermark is to have it appear in a random fashion on the finished sheet. In this display, one complete watermark, or in some instances part of a watermark, will appear on each 8 1/2 x 11 sheet. Depending on the size of the design, marks can be furnished to appear on a higher frequency - staggered or uniformly. However, the location of any random mark will vary from sheet to sheet and cannot be controlled to appear in the same exact position on each and every sheet. A random mark will appear in the same line vertically on the sheet, but may be in different locations from top to bottom.



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### Localized Watermarks

If more critical positioning of your watermark is required, you might want to consider a localized watermark. Electronically controlled positioning guarantees that the mark will appear within (plus or minus) one-half (1/2) inch of the position specified (in any direction) when the sheet is cut to letterhead size. However, approximately 80% of the total quantity ordered will usually appear within (plus or minus) one-quarter (1/4) inch of the position specified. Paper in rolls cannot be localized but design can be centered from side to side parallel to grain direction. For many business firms, localized watermarks are most generally centered in the lower two-thirds of the sheet so that it will appear centered in the body of the letterhead or corresponding copy. It is also often "localized" in the lower right or lower left hand corner of the sheet, where typing seldom occurs.

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### Paraded Marks

The Dandy roll for this type of watermarking is usually designed to guarantee two full marks and a portion of a third mark appearing in each 8 1/2 x 11 sheet. These marks can be "paraded" across the sheet anywhere ... either vertically or horizontally.

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### Staggered Marks

Staggered watermarks are produced in the same manner as paraded marks, but with some visual variation. They appear in varying locations on each sheet.

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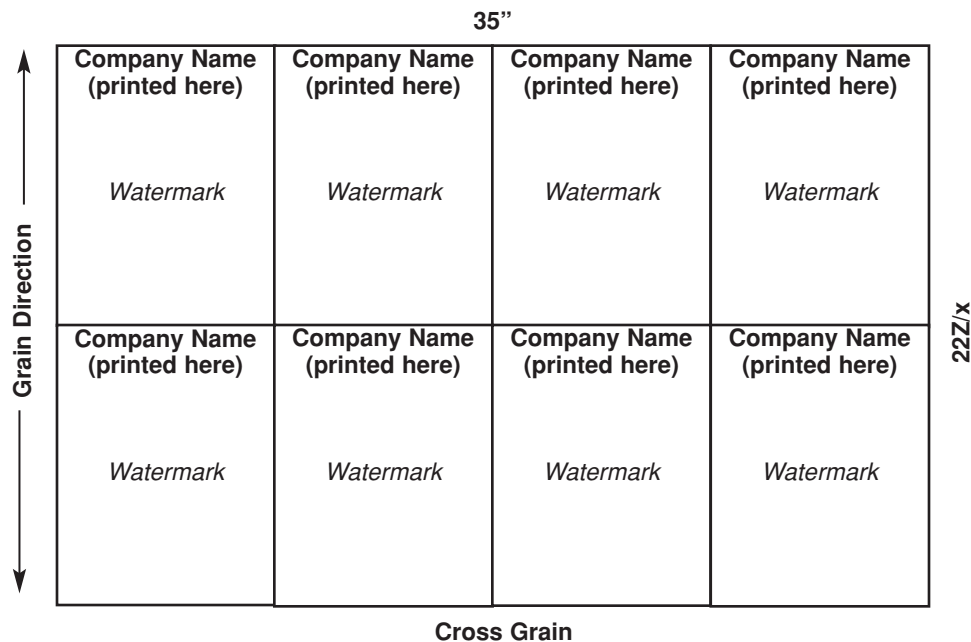
### Watermark Configurations

Perhaps the most confusing part of bond and writing papers is the watermark configurations; by that we mean how and where the watermarks are impressed on the master size paper sheet. Once the confusion is cleared up, however, the paper salesperson can guide printers in ordering the proper watermark configuration for a given job.

#### Head-to-foot

The term "head to foot configuration" means that on the sheet the head, or top of the watermark, reads to the bottom, or foot, of the watermark above. Therefore, on the master sheet all watermarks read correctly from one side of the sheet. As you can see in the diagram, the watermark dies run across the Dandy roll, imprinting the watermark perpendicular to the paper grain. The result: master sheets watermarked in the head-to-foot configuration will be watermarked across the grain of the paper. Because in the paper manufacturing process the web stretches in the grain direction, the watermark can travel from the bottom edge to the top edge in succeeding letterheads. Also, the watermark may be cut with part of it appearing at the bottom of the letterhead and part of it appearing at the top.

This pattern usually results in a grain short parent sheet size such as 29 x 21; 34 x 24; 38 x 24; 34 x 22; 35 x 22Z\X. Final Letterheads cut from the above will be grain long. The printer will print one row of "mastheads" along one edge and another row across the center of the press sheet.



#### Head-To-Head

In this configuration, the head of one watermark reads to the head of the watermark above, which is upside down, on the master sheet. Therefore, on the master sheet half of the watermarks are readable while the other half appear upside down. The watermark dies run around the Dandy roll, imprinting along the paper grain, as you can see in the diagram. The result: master sheets watermarked head-to-head configuration will be watermarked along the grain direction of the paper. Because the paper web stretches in the grain direction, the watermark can drift from the right-hand side of the letterhead to the left-hand side in succeeding letterheads. Thus, in some letterheads part of the watermark may appear on one side of the letterhead and part on the other side. Although it may be cut, there is always a complete mark on each 8Z\X x 11.



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### Head to Head, Continued

#### Long Grain 35"

This pattern usually results in a grain long parent sheet size such as:

21 x **29**; 24 x **38**; 22 x **34**; 22Z/x x **35**.

Final letterheads cut from the above will be grain short.

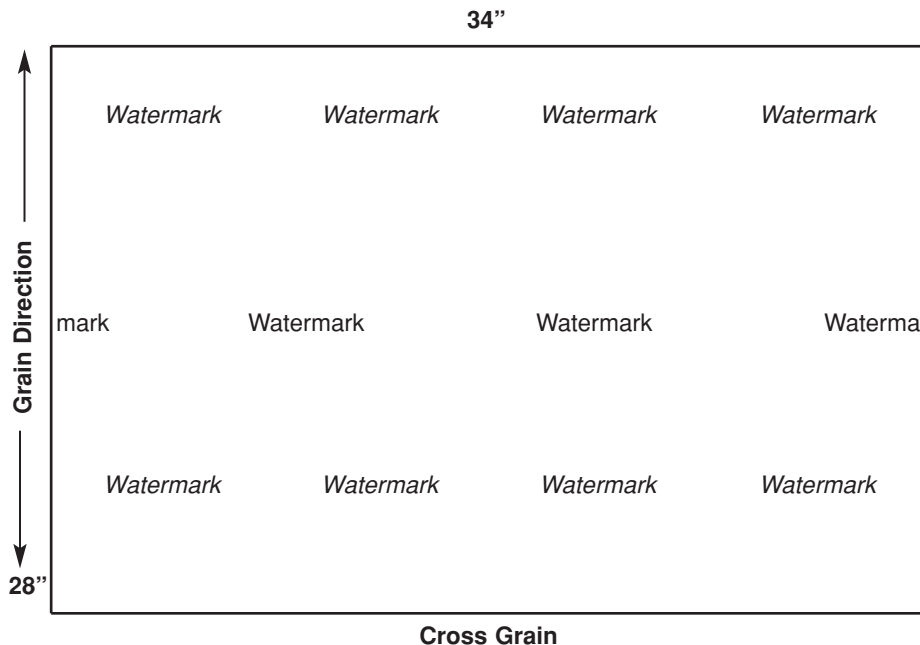
All "mastheads" will print across the center of the sheet providing better register control.

These 3 grain long parent sheets yield a grain long final letterhead:

17 x **22**; 17Z/x x **22Z/x**; 19 x **24**

Watermark	Watermark	Watermark	Watermark	22Z/x
Company Name (printed here)	Company Name (printed here)	Company Name (printed here)	Company Name (printed here)	
Company Name (printed here)	Company Name (printed here)	Company Name (printed here)	Company Name (printed here)	
Watermark	Watermark	Watermark	Watermark	

← Grain Direction →



#### All-Over

This watermark position is used almost exclusively for the manufacturer of paper for envelope conversion where watermark placement is not as important. The all-over pattern features a head-to-foot staggered watermark, and can be either cross grain or long grain.

The all-over watermark is often attractive to individuals or companies who choose to design a non-standard size letterhead. For example, a 6x9 size letterhead folded in half lengthwise to fit a #10 envelope would result in some of the watermark showing in each letterhead, with no concern for laying out the press sheet.

Sheet sizes made from this all-over pattern are:

17 x **28**; 34x **28**; 28 x **34**