



## *Making paper fun*

# *Grain Power: Make it Work for You*

Understanding your paper's grain direction is a detail about papermaking and printing that makes you a better designer. This one technicality has a profound effect on the success of your final project and determines why a folder you have designed has a tendency to reopen, the fold in your piece is ragged and bumpier than you expected and then there's the problem of the ink cracking along the crease ...

### **Your swatchbook as grain guide**

You can determine the grain direction of your paper by taking a closer look at the way the sheet sizes are listed in the mills' swatchbook. You'll notice that the bold or underlined number indicates the grain direction of the paper.

For example, sizes are listed as "8 1/2 x 11" or "8.5 x 11." This means that the tall, long side – 11" – runs with the grain – also called grain long. If the paper is listed as "11 x 8.5," the grain runs with the short side of the sheet – also called grain short.

### **Two simple tests to find grain direction**

It's a good practice to verify grain direction and there are a number of very easy indicators that also demonstrate why grain direction is so important. A favorite of mine is the Tear Test, where you take a piece of paper and tear it vertically, then horizontally. The relatively straight tear will be the tear with the grain. The tear with the more jagged edge will have had to stand more resistance and is the tear against the grain.

There is also a Fold Test which works best using a Cover stock. After you fold the sheet first vertically and then horizontally, you'll see the fold with the grain is straighter and smoother and the fold against the grain is more bumpy and ragged.

### **How folding affects scoring**

The projects you've designed that need folding will benefit from your knowledge of grain direction. With the simple tests above, folding with the grain is smoother, even in heavier sheets. Scoring is unnecessary, unless you have selected a heavier Cover weight of paper or if the paper has been folded against the grain. In that case, you must always score the stock to prepare for a sharper fold and reduce the problem of cracking on the fold.



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It's also important that the folded sheets or brochures lay flat. The tendency to reopen is caused by a particular resilience in the paper. Once again, when the paper is folded with the grain or parallel to the grain, as it is also referred to, the opening is least noticeable and lays properly.

### **Don't let cracking ruin your design**

Cracking is always a problem when there is folding through areas that have heavy ink coverage. When sheets are printed digitally on dry-toner presses, they are particularly sensitive to cracking.

The same issues of grain direction in folding are also true for cracking and as you can expect from our folding experience, there will be less cracking when your piece is folded with the grain than against the grain. If you keep printing along the fold to a minimum, you can avoid the problem, but if printing along the fold is necessary to the design of the piece, scoring will help reduce the cracking dilemma.

### **Strength may be your priority**

While folding with the grain creates smooth and flat folds and avoids cracking, there are also projects that may benefit from choosing to design against the grain.

Grain direction not only influences the paper's folding abilities, but also its strength, as we've seen in our Tear Tests. Paper that is folded against the grain has increased durability and resists tearing. This strength can be used to your advantage when designing your next pocket folder or saddle-stitched document.

Depending on the type of project you are designing, when you choose grain direction, you are choosing whether smoothness of the fold or the durability of the piece is more important for the end product. Your printer will appreciate knowing your preference and you will gain the ability to control one more technical piece of the design puzzle to create a better project.