

# General Product Guidelines

## Storage, Handling and Pressroom Conditions

As with any printing papers, PaperTyger printing papers should be allowed to become fully acclimated to pressroom conditions before attempting to use them. PaperTyger papers are manufactured to a relative humidity of 42-50% @ 72°F / 22°C.

As relative humidity is a function of temperature, **the first step is to be sure paper reaches the temperature of the pressroom before opening any packages, cartons, or skids.** Use this paper conditioning chart as a guideline for how long, e.g. cold paper might need to reach the temperature inside the pressroom.

Cubic volume of paper on skid or in roll	Difference in Temperature of Paper and Temperature of Room in Which it is Opened (°F)							
	10	15	20	25	30	40	50	60
	Hours paper should stand							
6 cubic ft.	5	9	12	15	18	25	35	54
12 cubic ft.	8	14	18	22	27	38	51	78
24 cubic ft.	11	16	23	28	35	48	67	100
48 cubic ft.	14	19	26	32	38	54	75	109
96 cubic ft.	15	20	27	34	41	57	79	115

Chart provided by the Graphic Arts Technical Foundation

The next step is to ensure that the pressroom conditions are in balance with the paper. If pressroom conditions are 72°F / 22°C and relative humidity is 42-50%, the product is in balance and will perform well. If, however, the relative humidity in the pressroom varies + or – 15% from these conditions there is a chance that miss registration, curl, or wrinkling could occur.

## Storing Paper – Temperature and Moisture Considerations

### Temperature

Paper needs to 'acclimate' to its environment. The greater the difference between the temperature of the paper and the room in which it's opened, the longer it takes for the paper to be temperature-conditioned.

The chart above also shows the time required to temperature-condition paper based on the volume of paper and the temperature differential.

### Moisture

The moisture content of paper is affected by both the drying conditions when it is made and the relative humidity of the environment in which it's used. Ideally, paper should be made with the moisture content in equilibrium with the relative humidity where it will be used. Of course, environmental conditions vary at different places and times of the year. Ideal conditions seldom occur. When paper is drier than its environment, it will pick up moisture, and when wetter it will give up moisture. If the differences are great

enough, these changes in moisture level will cause dimensional changes in the paper and cause problems such as curl, warp and waviness. The optimum environmental balance for paper is 74oF / 23°C and 50% relative humidity.

### **Why Be Concerned About Storage?**

Paper is made from cellulose fibre, an organic material. When the manufacturer presses the cellulose fibres together to form a sheet of paper the resulting material 'breathes' so it will absorb moisture in high humidity or release moisture in very dry conditions. Consequently, care must be taken in storing paper to assure that the desired properties acquired in manufacturing are maintained during storage and handling.

Paper that is closely packed on skids, in cartons or tightly wound rolls may begin to absorb moisture at the edges, which will appear wavy, while the centre portions of the paper remain dry. The paper has 'grown' at the edges by absorbing moisture, but not at the centre so that the performance characteristics of the paper are inconsistent. The result: feeding problems, registration issues, poor run ability etc.

### **An Ounce of Prevention**

Storing paper correctly can prevent a lot of headaches.

Paper skids and rolls should not be in direct contact with concrete or damp floors. Avoid temperature extremes, i.e. heat sources such as radiators or cold sources such as exterior walls or unheated warehouses in winter. To prevent moisture from leaching into the edges, avoid storing rolls on-end on concrete floors.

**Never unload paper from a truck and take it straight to the pressroom! It needs to acclimate. When skids of paper are brought into the pressroom, bands and wrapping should remain intact until the skids have been placed at the press and the paper has reached pressroom temperature.**

The same is true for rolls. Un-wrap the roll just prior to hanging on the roll stands. Moisture can influence the stack between press passes if it's not properly stored, causing registration problems the second time through.

Conditioning is also important for those who utilize cut-size paper. Sheets that have absorbed moisture may curl when they pass the fuser system of copiers or laser printers. If possible, locate printing and copying operations where the temperature and humidity are controlled, to prevent excess moisture absorption. Ream wrap should be removed 24 hours before the paper is loaded into the copier or printer.

### **PaperTyger Paper Product Storage Instructions**

***The following are recommended for product storage:***

1. Keep products dry at all times. If a product is received wet or the packaging shows evidence of moisture exposure, contact PaperTyger customer service immediately.
2. Do not store boxes or rolls of a product on a concrete floor or directly against a concrete wall.
3. Keep the product on a pallet, rack or shelf.
4. Do not store product where water can be splashed onto the material and its packaging.
5. Do not store in a room that is steam cleaned or reaches high humidity levels.
6. Sheets: At all times when not in use keep the sheets covered or wrapped.
7. Rolls: Rolls should be stored wrapped as received until ready for use.
8. PaperTyger Products need to "acclimate" to the environment just like stock rolls of paper.
9. The optimum environmental balance for paper is 72°F / 22°C and 50% Relative Humidity (RH).
10. Sheets and Rolls of PaperTyger material should be stored in shipping wrap (as received) until use.

The above-recommended storage instructions will increase the effectiveness and shelf-life of PaperTyger products. Storage is a critical component of material use. If there are any questions pertaining to the storage of PaperTyger materials, please do not hesitate to contact our customer service manager or quality manager.

## Handling

### **Clamp Settings**

In the Oxford plant we use a medium setting which equates to about 500 psi. Please note that the force generated is dependent on the hydraulic piston size, the clamp size, and the pressure settings.

### **Finishing Techniques – PaperTyger Custom Rolls**

- Guillotine Trimming
- Slitting
- Die Cutting
- Hole Punching / Drilling
- Perforation
- Folding
- Gluing and Bonding
- Sewing and Grommeting
- Foil Stamping
- Embossing

### **Guillotine Trimming**

When trimming on a guillotine, a sharp blade is required. PaperTyger will trim as comparable papers would. Fanning of the cut edge of the stack is usually sufficient to break edge fusion.

### **Slitting**

Shear slitting with sharp blades, close tolerance to the blade, and good alignment is recommended to produce smooth edges and minimise dust. Score slitting is also an acceptable means of slitting PaperTyger but will not produce as clean an edge as shear slitting. Razor slitting of PaperTyger substrate is not recommended because it creates dust and fibres on cut edges and does not leave a clean sharp edge.

Recommended processing tensions of PaperTyger laminates vary from 1.5 to 2 pounds per linear (PLI) for the thinner substrates to 2.5 to 3 PLI for the thicker substrates. So, for every inch of width in the master roll, 1.5 to 2 pounds of tension needs to be used. For example, a 50-inch roll would run between 75# (50\*1.5) to 100 # (50\*2) of tension.

### **Die Cutting**

Several types of die-cutting have been demonstrated with Paper Tyger: steel rule dies, forged or "high" dies, rotary dies, and blanking dies. These require sharp cutting edges to produce clean cuts in PaperTyger; because plastics do not burst like paper PaperTyger must be completely penetrated. Rotary die cutting PaperTyger is comparable to paper with no measurable wear to the die blade. Blanking die cuts are typically used on PaperTyger and die cuts comparable to Paper.

### **Hole Punching / Drilling**

Use sharp dies, tight male/female tolerances will improve punching performance.

### ***When drilling holes in PaperTyger***

- Using sharp drill bits with drill wax and a rapid delivery
- Drilling in short lifts with a wax paper or carbon paper on top of the lifts to lubricate the drill bit

Line hole punching can be done using sharp, hardened dies.

### **Perforation**

PaperTyger's tear resistance is greater in the cross direction (CD). Microperfining will provide approximately equal tear in both directions. Sharp perforation wheels and bars will provide the cleanest job. A litho perforation is also a form of Perforation used on PaperTyger.

### **Folding**

PaperTyger folds well in either direction. Scoring is recommended to obtain a tight fold on PaperTyger. The grain direction of PaperTyger is similar to that of paper; therefore, the direction can affect the tear characteristic of the sheet. The best way to determine the optimum configuration of a fold in design is to test the effect of the sheet direction on the final product. For optimum fold performance, the machine direction of Paper Tyger substrate should be oriented perpendicular to the direction of the fold line.

### **Gluing and Bonding**

There are several end-uses which require gluing or bonding of PaperTyger hot melt adhesives water-based glues and adhesives can be used and will bond as comparable paper would. PaperTyger will also accept latex.

### **Sewing and Grommeting**

In general, PaperTyger fabricates much like film and should be handled as such.

### **Foil Stamping**

When properly applied, foil can adhere to PaperTyger as comparable papers would. Temperatures in the range of 200 - 240 F may be required. The temperature setting will be a function of the foil, the pattern and the hardware. It is recommended that some experimental work be conducted to determine the best set of conditions for the contemplated design.

### **Embossing**

With a male and female die system, PaperTyger will emboss similar to comparable papers. The effects of embossing will be most pronounced with thicker grades of PaperTyger. Cold embossing is generally comparable to paper. Dwell times and pressure requirements will be a function of the graphics, the degree of embossing desired, and the hardware.

### ***These printing processes have been evaluated using the product:***

**Digital Presses** - PaperTyger can be printed using most digital presses from Kodak to Xerox. It is always recommended to test a small amount of PaperTyger on the press.

**Flexography** - PaperTyger should be handled as comparable papers. Due to the product's ability to absorb water as standard paper would, both solvent-based and water-based flexography inks work well.

Ovens and dryers should be operated at a rate comparable to paper with normal airflow rates.

**Screen Printing** - PaperTyger is compatible with screen printing due to its excellent lay flat and ink holdout; drying temperatures are typical of that of paper.

**Laser Printers and Copiers** – PaperTyger can be made available in the appropriate roll and sheet configuration for digital printers. PaperTyger is digital and laser guaranteed. PaperTyger is optimized for laser and toner printability without the need for an expensive coating like many synthetic printing substrate papers.

**Overprint Coatings/Varnishes** - Ultraviolet (UV) radiation curable coatings, Water-based or aqueous coatings, Oleo resinous (oil-based resin) coatings. Overprint varnishes (OPV's) are coatings applied to an already printed sheet or web. The primary reasons for applying an OPV are gloss enhancement, stain resistance, edge fusion resistance, burnish or scuff resistance and resistance to discoloration

from absorption of impurities in the environment. There are three basic types of OPV's; oil-based, water-based, and radiation curable. Overprint coatings/varnishes set and dry quickly on PaperTyger. Therefore, offsetting or blocking is not a problem when applying them to PaperTyger. The amount of press varnish required is typically equal to that required for the paper.

**Inkjet Printing** – PaperTyger substrate readily accepts aqueous ink jet images, the sheet is optimized for inkjet printability and yields photo-realistic images and prints as standard copy paper would.

**Wide Format** - PaperTyger Wide Format creates a tear-resistant, lay flat sheet that tracks without static or curl through both roll and sheetfed inkjet and toner devices. The paper surface also has compatibility with multiple ink sets and toner devices.

**HP Indigo** – PaperTyger Indigo products are certified to run on the HP Indigo line of digital printers. Cost-effective for short-run and custom business, PaperTyger and HP Indigo offers a unique partnership providing the flexibility and ease of using a durable substrate on printing projects while maintaining a fast turnaround. PaperTyger is certified for HP Indigo Digital presses; 7000, 5000, 5500, 5600 multi-shot, 7500, 7600, 7800, 7900, 10000 & 12000

## Trouble shooting

**Static Issues** - When press is properly grounded, metal core tinsel can dissipate static by induction. The tinsel must be tightly stretched approximately 1/8" from the paper surface without contact. It is best placed across the pile at the feeder head at the point of sheet separation and across the feed board where adequate air space exists under the sheet. The tinsel should then be attached to a properly grounded press or other conductive object.

**Paper Settings** – If PaperTyger is not printing well on the uncoated paper setting. Click the Media drop-down list to choose the type of paper you want to print to. Some printers can use special kinds of paper (such as glossy paper, coated paper, premium paper, smooth papers or presentation graphics, and transparencies,). Those printers print differently depending on the kind of paper being used. Please select coated setting and test print, coated paper and test print and so on. If this is not successful please try another setting till you get the results you are looking for.

**Melting point** – The melting of the poly in PaperTyger has a melting point of 171 °C (340 °F). If fusing temperatures are above 171 °C (340 °F). Please test PaperTyger in the application. Samples can be requested for testing.

### **Coated Paper Cracking**

- Before scoring always allow the paper to re-gain moisture after digitally printing it.
- Use as wide a die set as possible to insure as much material as possible is part of the fold. This will reduce the stress in one specific area, reducing the frequency of cracking.
- For our F4926/F2591 C2S product remember even though it is 295gsm the paper is really only 120gsm, make sure you are not scoring on the 300gsm setting and tearing the paper fibers.
- Most printers would and should use a tri-creaser when converting lightweight coated paper.
- If using an auto-creaser, use a wide die set vs. the standard one for lightweight coated.
- Use the lower fold plates when possible.
- Roll scoring is not ideal for coated paper it tears the fibers and can lead to cracking.
- Tests have been carried out on PaperTyger with Morgana who are the preferred finishing partner of all the leading manufacturers of digital print engines around the world.