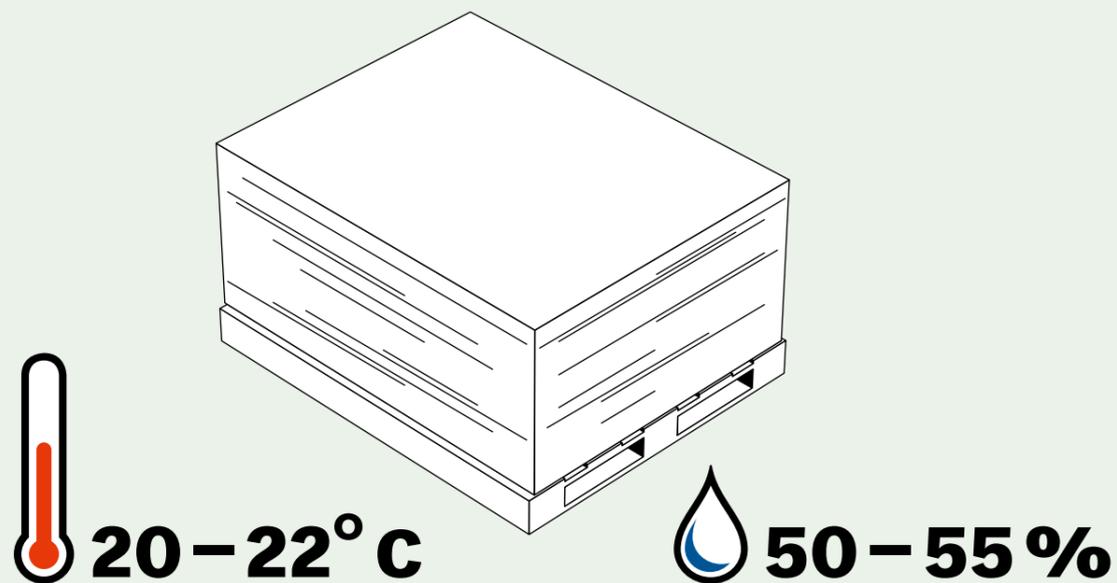


## TOO MOIST, TOO DRY, TOO HOT?

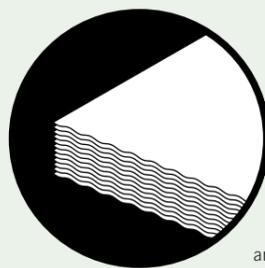
**Tips and tricks for substrates in digital printing.** While paper and other substrates are subjected to high levels of moisture in offset printing, digital printing is all about heat. Toner is fixed at temperatures from 140 to over 200 degrees Celsius, which poses particular challenges when it comes to choosing the correct paper. However, other factors such as storage, surface finish or grain direction also have a considerable effect on print results.



### GOOD CLIMATE

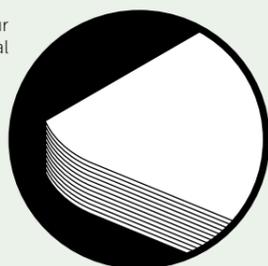
Paper is particularly sensitive to changes in room climate. Visible signs of sensitivity to weather generally include effects such as wavy edges, tight edges or double feeds resulting from the paper developing a static charge.

All of this can be avoided by storing the paper correctly. For example, throughout the year, the relative humidity of the storage rooms should be 50 % ± 5 % and the temperature between 20 and 22 degrees Celsius. Where there are slight deviations, it is best to leave the paper in the climate-protected packaging till shortly before printing, and to put unused paper back into this packaging. Where deviations are more pronounced, the quantity of paper required should be brought into the print room – in its packaging and also wrapped in film – at least 24 hours beforehand so that the paper can acclimatize.



**Wavy edges:** Wavy edges occur when moisture from the ambient air penetrates the paper and the edges expand relative to the middle of the sheet. This can lead to poor paper travel, paper jams, reduced toner adhesion, color variation and an inconsistent print image.

**Tight edges:** Tight edges primarily occur in dry, heated rooms in winter. Residual moisture is removed from the edges of the sheets of paper. The edges then shrink relative to the middle of the sheet and curl upward. The poor flatness causes similar problems to those encountered with wavy edges.



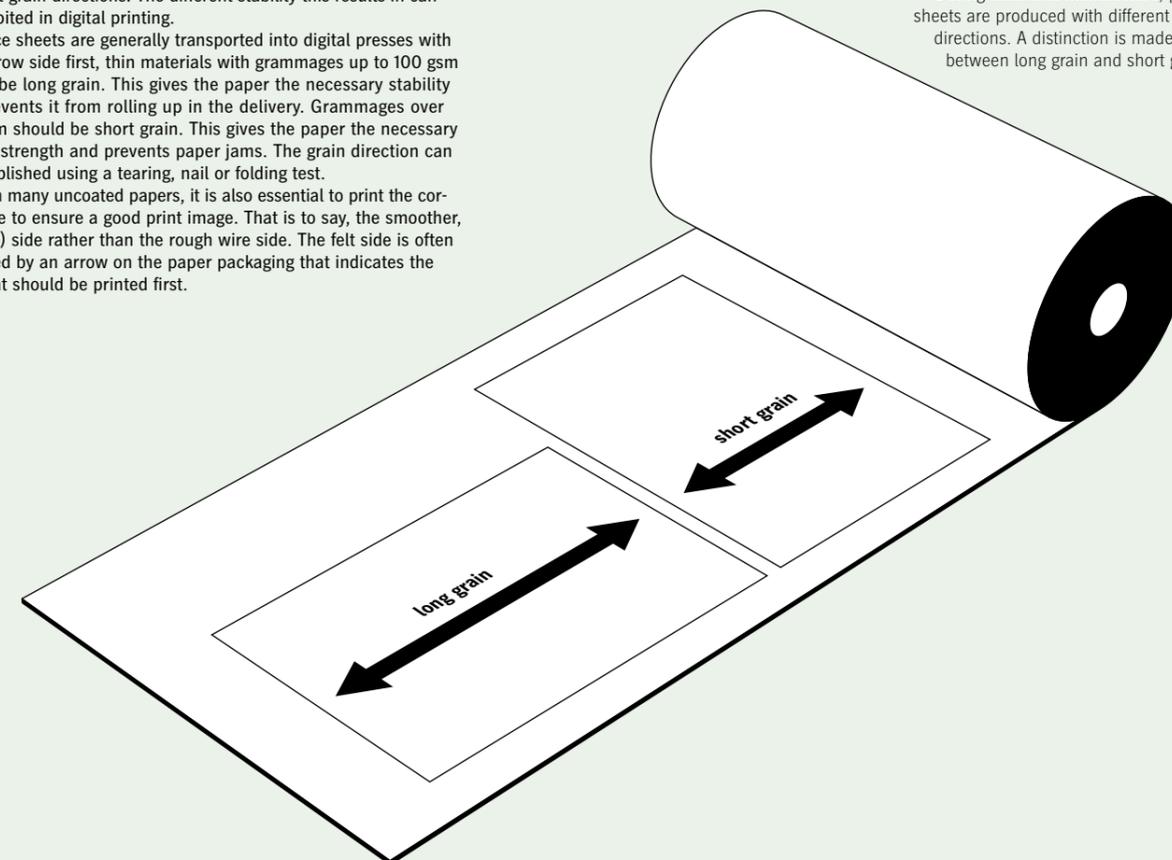
### TIPS & TRICKS

### THE CORRECT SIDE, THE CORRECT GRAIN DIRECTION

In the industrial manufacture of paper, the individual fibers are aligned longitudinally to the paper web. Sheets are cut from the web either lengthways or crossways, which creates sheets with different grain directions. The different stability this results in can be exploited in digital printing.

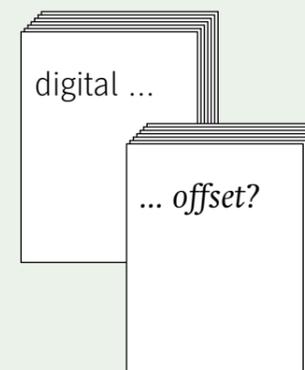
Since sheets are generally transported into digital presses with the narrow side first, thin materials with grammages up to 100 gsm should be long grain. This gives the paper the necessary stability and prevents it from rolling up in the delivery. Grammages over 250 gsm should be short grain. This gives the paper the necessary flexible strength and prevents paper jams. The grain direction can be established using a tearing, nail or folding test.

With many uncoated papers, it is also essential to print the correct side to ensure a good print image. That is to say, the smoother, felt (top) side rather than the rough wire side. The felt side is often indicated by an arrow on the paper packaging that indicates the side that should be printed first.



#### Long grain/short grain paper rolls:

During industrial manufacture, paper sheets are produced with different grain directions. A distinction is made here between long grain and short grain.



### OFFSET OR DIGITAL PRINTING PAPER?

Digital printing paper should be used for xerographic printing processes as a matter of course. This material is less critical, because at 30–35 %, its residual moisture is only about half that of offset printing paper. As a result, it shrinks less during the hot fixation process. In addition, the smooth surface of the paper ensures better toner adhesion and a particularly sharp print image.

Coated offset paper, however, which is frequently used when offset jobs are digitally reprinted or versioned in short runs, can also achieve equally good results. Unfortunately, this paper can shrink by as much as 1 mm over a length of 45 cm during digital printing. The problems this causes in perfecting can be resolved through balancing out/adaption or compensated for by percentage size adjustment of the front, i.e. recto side. In view of the enormous variety of substrates available for offset printing, the paper should always be tested beforehand.

The immediate drying that occurs in digital printing makes it ideal for the use of synthetic substrates such as foils/films or thicker plastic materials. It is important to ensure that the substrates used, including window envelopes, are heat resistant up to a temperature of around 200 degrees Celsius.