



## Flexo plate waviness - Frequently Asked Questions (FAQ)

Miraclon is committed to delivering the highest quality flexo plate products. As the plates come off the production line during the manufacturing process, our production team monitors and controls the parameters that are critically important for minimizing waves—for example, film tension and box quality. Our Quality Assurance team ensures that the plates released from the factory meet our performance standards that supports our Certificate of Conformance (CoC). However, there are factors that can introduce waves into the plate after it has been packaged and shipped. These frequently asked questions (FAQ) and supporting recommendations are intended to help you consistently assess and evaluate if you can use plates that exhibit waviness, and, in some cases, alleviate the waviness so the plate can be used.

### Is it normal to observe waves in raw and processed flexo plate?

Ideally raw or processed plates will have little waviness if stored and handled per our recommendations. However, there are factors that can introduce waves into the plate after it has been packaged and shipped.

### What causes plate waviness to occur?

When you inspect FLEXCEL Plates in their original shipping carton, you may notice varying degrees of plate waviness.

- Poor shipping conditions can cause excessive waviness, such as when boxes are placed on their edges or at a steep angle instead of being shipped flat. Note that Miraclon does provide specific instructions to our logistics partners and prints the instructions on the plate packaging labels as a preventative measure.
- Environmental conditions, especially frequently changing conditions, can result in plate waviness. In most instances, the waves are inconsequential for the final processed plate.
- Excessive humidity in the environment, and especially if the boxes get wet, can result in severe waves. Wet cardboard packaging can swell and become very wavy, affecting the raw plates.

### What problems can be caused by wavy plates?

Waves in a plate will potentially impact the registration on press for print job. If the plate waves are pronounced, you may end up outside the ISO recommendation for registration accuracy.

- ISO 12647-6 provides a specification with a required registration accuracy of 0.02%.

To meet this standard, our recommendation is to use plates where the measured amplitude of the wave is  $\leq 1.5$  mm (about 0.06 in) after the plate has been acclimated in the platemaking environment for at least 12 hours.

## How can I measure the waves in a flexo plate?

Acclimate the plates for 12 hours in the platemaking environment before starting the platemaking process or measuring for waviness. The best way to characterize the severity of the waviness is as follows:

1. With its protective cover sheet facing up, place the plate on a flat surface that is large enough to support the entire plate. The laminator table is an ideal surface for the plate to be placed and measured.
2. To assess the maximum waviness, identify the largest wave, and measure the thickness from the flat top surface of the plate to the bottom of the plate.

If the measured distance is  $\leq 1.5$  mm (about 0.06 in), the registration error of the final plates due to waviness is well within the ISO standard. The 1.5-mm magnitude provides a significant margin.

Raw plates that have large waves  $> 1.5$  mm (about 0.06 in) are best not to be used.

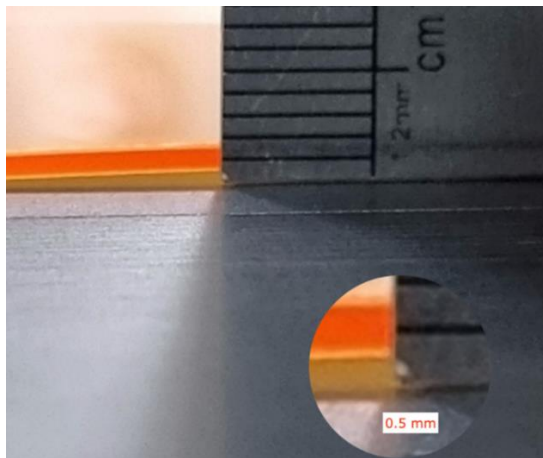


Figure 1 Low plate wave that is within tolerance ( $\leq 1.5$  mm).

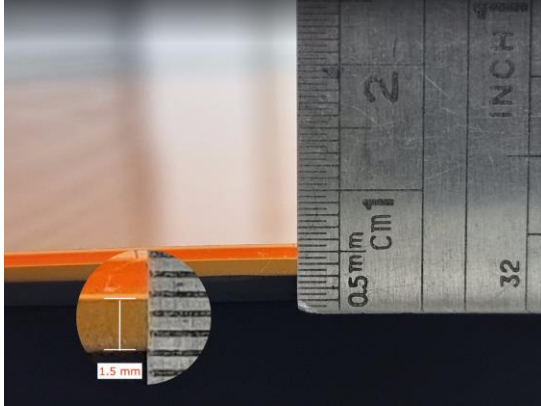


Figure 2 Medium wave that is at the top of the acceptable tolerance ( $\leq 1.5$  mm).



Figure 3 High wave that exceeds the acceptable tolerance (the measured wave is  $> 1.5$  mm).

### **What can I do if I have a plate with waves that exceed the acceptable level of waves?**

There are several steps you can take to try to alleviate the waves and get the plate to relax and flatten out:

- Store in a stable environment close to room temperature. We recommend our raw plates be stored within a range of 32°–104°F (0°–40°C). Avoid extreme temperature shifts for extended periods of time or storing at the upper and lower temperatures of the recommended range. The plates should not be allowed to freeze.
- Provide a clean and stable platemaking environment of 17°– 30°C (63°– 86°F), with 40 – 60% relative humidity, non-condensing.
- Store flat. Open the box to allow the humidity in the box to acclimate with the platemaking environment.
- Acclimate the plates for 12 hours in the platemaking environment before starting the platemaking process or measuring for waviness.

- If the raw plates are still wavy after acclimatization, measure the amplitude of the wave to determine if it fits within the guidelines.
- It is best to discard a plate if the raw plate is:
  - Exhibiting waviness on two or more sides of the plate; and
  - The waves are travelling several inches into the plate (1/3 or more of the length); and
  - The measurement of the amplitude of the waves is outside the stated guideline.

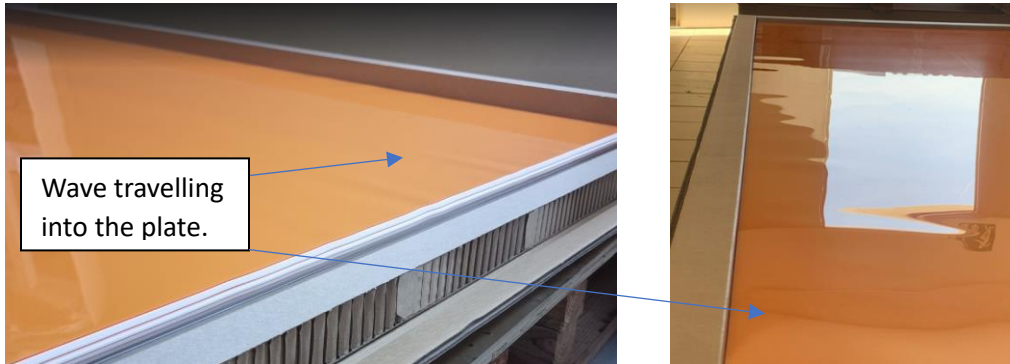


Figure 4 Images of wavy plates with the waves traveling several inches into the plate.

## Can a wavy raw plate result in an acceptable finished plate?

Yes, a plate wave below 1.5mm (about 0.06 in) plate will ensure alignment to the ISO spec for plate registration. Usually the vacuum draw-down process on the laminator will pull the plate flat onto the vacuum table before it laminates the FLEXCEL NX Thermal Imaging Layer (TIL or TIL-R) to the FLEXCEL NX plate. The plate will often then relax and lay flat.

## Should I mount a finished wavy plate?

It is not advised to attempt to mount a processed plate that exhibits waviness outside of the tolerance (> 1.5 mm).

When mounting a plate, the goal is to avoid stretching and excessive compression. Use a roller to keep air from becoming trapped between the plate and the tape. Avoid forcing the plate— depending on the plate size, forcing may result in minor deformations and lead to potential misregistration.

Repeated remounting can also contribute to plate stretching, especially if high adhesion tapes are used.

## How do I prevent inducing waviness in flexo plates?

- When moving plate boxes around the site, do not tip onto one side or stand on the edge. Boxes of raw/unexposed consumables should be transported and stored flat and never on end. When raw plate material is stored on the side, the polymer will flow downward and squeeze out of the edge. This results in sheets that become fused together on the edge that is facing downward and can also influence the uniformity of the sheet thickness.
- Ensure that the storage conditions are stable, dry, and close to room temperature → Temperature and humidity swings will induce waviness.

- Store the plates flat in their original packaging.
- Do not store raw plate material near direct heat sources or near heating vents, cooling vents, or close to equipment where ozone may be present (for example, a corona treater).
- Boxes should be kept dry as direct exposure to water could compromise the box's integrity and/or induce a warp that affects the products within.
- When storing these boxes, only stack ones of the same size on top of one another. Stacking a larger box on top of a smaller box leaves the edges of the material unsupported, and the protective cover sheet(s) on the photopolymer plates could be released.
- Plate boxes that are stacked on a pallet should be equal to or smaller in size than the pallet used. Boxes that overhang pallets or shelves are unsupported and susceptible to damage.
- Stack the boxes horizontally according to the following limits per product line. Unless otherwise stated, the general guidelines are as follows:

#### FLEXCEL NXH Plates

- For plates  $\leq 1.70$  mm (0.067 in.), limit each stack to a maximum of **6** boxes.
- For plates  $\geq 2.54$  mm (0.100 in.), limit each stack to a maximum of **6** boxes.

#### FLEXCEL NXG Plates

- For plates sizes  $\leq 1067$  mm x 1524 mm (42" x 60"), limit each stack to a maximum of **6** boxes.
- For plates sizes  $> 1067$  mm x 1524 mm (42" x 60"), limit each stack to a maximum of **5** boxes.

#### FLEXCEL NXUH Plates

- For plates  $\leq 1.70$  mm (0.067 in.), limit each stack to a maximum of **10** boxes.
- To avoid damage when transporting the individual larger-format plates, use the media handling cart according to the instructions in the Visual Reference Guide for your FLEXCEL NX system.
- To minimize kinks and bowing, handle individual plates by the corners.

## Where can I find more information?

For more information about the best practices for shipping, storage, and handling of Miraclon consumables go to [Consumables Storage, Handling & Disposal - Miraclon](#)



SCAN FOR MORE  
INFORMATION ON  
PRODUCT STORAGE,  
HANDLING AND  
RECYCLING

### **About FLEXCEL NX Products**

*The unmatched performance of FLEXCEL NX Plates results from the synergy of our cutting-edge technology. This includes the FLEXCEL NX Thermal Imaging Layer, which leverages unique imaging technology, along with a robust lamination process. The outcome is high-resolution imagery on the plate, precise 1:1 dot replication, and consistent, predictable ink transfer.*

*FLEXCEL NX Plates are the definition of versatility and provide the ability to create high-quality print on a variety of substrates. Leveraging advanced plate surface patterning technology at the heart of the FLEXCEL NX System gives the flexibility to customize FLEXCEL NX Plate production for different applications. The FLEXCEL NX Plates exhibit remarkable versatility, allowing you to select from a range of inks, including water-based, solvent-based, UV-cured, and cationic inks.*

*All our FLEXCEL NX products are manufactured to a single global specification at our world class, ISO accredited, manufacturing facilities in the USA and Japan. These facilities have a proven 14-year production record of accomplishment for demanding customer applications for prepress that has consistently exceeded expectations.*