

Speed & Consistency

Key factors to achieve productivity with repetitive quality performance

In today's competitive marketplace, converters are being asked to reduce both time to market and warehouse turnovers, they must also deal with shorter runs and unexpected changes without forgetting the necessity of achieving higher production goals and improving quality.

Asking various converters about the factors that cause them to print slower than their presses are supposedly capable of, and that prevent them from getting repeated performance within a succession of jobs they mentioned as the most important:

Vibration or bouncing at high speed:

Pressure and register adjustment

Ink leaking

Color Management

Vibration is inherent to the flexo process. As far as the plates have printing/non printing areas, there will be impacts coming from the plate at every turn. But not only the vibrations come from the plate, when printing at high speeds, any variations in accuracy or out-of-balance of rotating parts, are magnified and can lead also to vibrations. All vibrations affect negatively to the printing quality and consistency, and indirectly also to the other above parameters.

Optimizing the performance of the Flexo process, such as Ink transfer & printing pressure, and eliminating variables that may cause bouncing is the target for all Flexo manufacturers. The main goal is to achieve consistent printing quality at high speeds.

Controlling the variables of the flexo process helps to eliminate defects during printing, but as some of the vibrations are inherent to the flexo process, a robust manufacturing of the press is the most important key to the printing quality and repeated performance.

Comexi offers a complete line of products, equipment, services and training to assist our customers in facing today's challenges: Our integrated expertise reduces risk by offering complete solutions. Our overall expertise and knowledge allows us to serve as an excellent choice to diagnose our customer problems and come up with a comprehensive and complete solution.

We use state-of-the art tools and certified industry specialists during the design process. We are used to meet high customer expectations in terms of quality, cost and time scheduling.

In the next lines you will be able to read about our newest innovations that allow our machines to lead the market in terms of repeated performance within any number of jobs or production cycles.

Starting with the foundations of our machines, the frames of the Comexi presses are made in cast iron and designed to minimize vibrations. They are designed following the *monoblock*® concept, with as maximum as possible of solid areas and minimum partitions, so we can keep both robustness and strict manufacturing tolerances and precision. They are not only designed at Comexi, but also manufactured internally in Comexi so we can guarantee the highest level of accuracy in all the measurements and the lowest possible tolerances.

The combination of solid *monoblock*® frames, with the strict manufacturing tolerances is what at the end guarantees the maximum performance at the higher speeds

Still focusing the stability and consistency of the Comexi presses, our main concern during the design of Comexi machines is to maximize deck robustness, in order to be able to print the most difficult jobs. This is why all the bearing clamps are made in cast iron, heavily reinforced, with a very solid articulation axis. Moreover, internal diameter of the bearings is 85mm instead of the regular 50-60mm.

Comexi relation with carbon fiber suppliers started a long time ago, which provides us with a vast knowledge in this area that we have implemented in our machines. The carbon fiber mandrels included in the Comexi presses provide better impact absorption and better behavior against bouncing at high speeds. The bigger diameter of the anilox and plate mandrels results in a lower flexion level when printing at high speeds.

The tests prove both a recovery time against impacts and a flexion level 50% lower than a conventional steel mandrel.

Our quality department defines very strict procedures that ensure full quality control during the whole manufacturing process, which allows Comexi Central Drums to guarantee construction tolerances below standards.

Central Drum Diameter	<2500 mm	>2500 mm
Typical TIR	0,005 mm	0,008 mm
Comexi guaranteed TIR	0,008 mm	0,010 mm

The Hastalloy® Plasma anti-corrosion coating avoids corrosion during the full product lifecycle.

Continuing with our focus on manufacturing high end products that allow for a high printing quality, one of the key factors is the stability and consistency of the ink doctoring in the anilox. Ink must be delivered constantly during all the job and in the correct quantity to achieve the best printing quality. One very important point on the doctoring is the robustness of the doctor blade and its supports, and the adjustment of it against the anilox, which in Comexi presses is made by the use of low friction pistons that guarantee the minimum pressure applied from the blade to the anilox. This leads to having better performance regarding bouncing and vibration, less wear

of the blades because of the synchronized movement of the doctor blade with the anilox mandrel, and also eliminating the ink leakages.

All Comexi presses have direct drive motor fixed on drum, direct motors fixed to plate mandrels without mechanical transmission and absolute encoders fitted to all shafts. Motors are controlled by the Direct-Encoder and print decks racking and pressure adjustments are made through servomotors.

The Virtual Master allows for a higher register accuracy ($\pm 25\mu$) and a reduced response time, even when changing the speed of the machine.

Comexi latest innovation regarding accuracy, precision and printing quality is the CingularReal², which is the name that we give to our automatic system to make the pressure and register adjustment. The name stands for a *real* adjusting system, because when it finishes the adjust, it has already been able to see the *real result*, so the waste generated is the real waste, no further corrections need to be made neither by the machine nor by the operator. The system finds the exact point for optimal printing quality with minimum overpressure, thus leading to better printing quality.

There is still one last key factor that you need to manage properly to achieve consistency and repetitive performance job after job: Colour. Colour adjustment is still often done directly on the machine during the job changeover. This introduces a lot of variation in the time and waste required for doing the whole changeover, negatively affecting the overall performance of the machine.

Good Practices “off machine” lead to avoid process colour adjustments (CMYK) and to reduce to a minimum the adjustments in spot colours. Comexi Cingular Match I provides the necessary rules to avoid making colour corrections during the job changeover to minimize machine downtime and to ensure repeatability through process standardization.

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