Micro-perforating Process

Brittle Perforating Teeth

Unfortunately producing a decent job on your folding machine can be made more complicated through unavoidable **wear** to the perf blade and the possibility of **teeth breaking off,** this is just a common fact we have had to accept.

In truth folders are made to **fold paper** and any perforating, cutting or scoring accessories that come with the machine have been produced only to aid this process.
It's this simple, if you try to produce flatbed quality micro-perforating by using **standard** perf devices on your Folding Machine you won't achieve it. Here are two simple reasons why:

- 12 TPI blades obviously produce 12 cuts per inch but unfortunately this is not classed as a true micro-perforating application. True micro-perforating rules used on a flatbed cylinder start at 17 TPI.
- The perforating blade makes contact with the bottom cutting anvil and overlaps by 2mm as seen in Figure 1. The teeth of the perforating blade produce a series of punctures to the stock surface that often results in distortion or broken particles; evidence of this can be seen with the untidy scattering of paper dust below. The dust and distortion of the paper stock can cause problems for those jobs that need to run through another process.

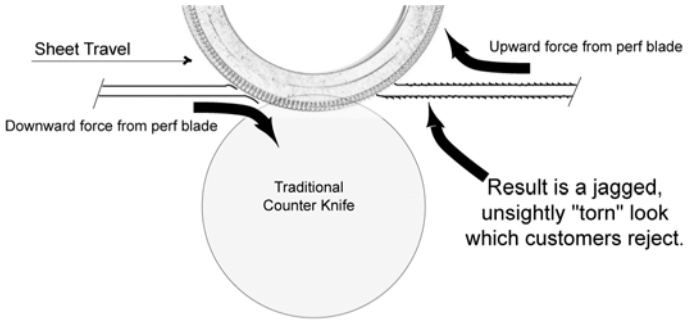


Figure 1 *Conventional perf deforms sheet both downward & upward.*

It's **not** hard to understand why micro-perforating is usually outsourced given that flatbed methods gently press up to 72 cuts per inch into the surface of the material without damaging the fibres. **In fact, it has become an industry standard over the past few years for micro-perforating applications to be fine and flat and without any distortion so that the perfed sheets can run trouble-free through laser printers.**

So what has been done to try to replicate this perfect flatbed method onto a folding machine over the years? A few companies have come up with finer perf blades and, although this is a partial improvement, it only leads to even smaller paper particles showering down below and retains the same **destructive** element to the paper stock.
Before coming up with the **perfect solution** to long lasting, trouble free and perfect rotary micro-perforating we studied the process adopted by flatbed cylinder machines. We also studied the mechanics of folding and scoring machines before combining all positive factors with our own ideas.

It seemed obvious that producing a device that would press a perf blade on top of an anvil to produce a flatter result was the key to rotary success and **in researching why so many had avoided this step, we got to the root of the problem, and came up with the following alarming discoveries:**

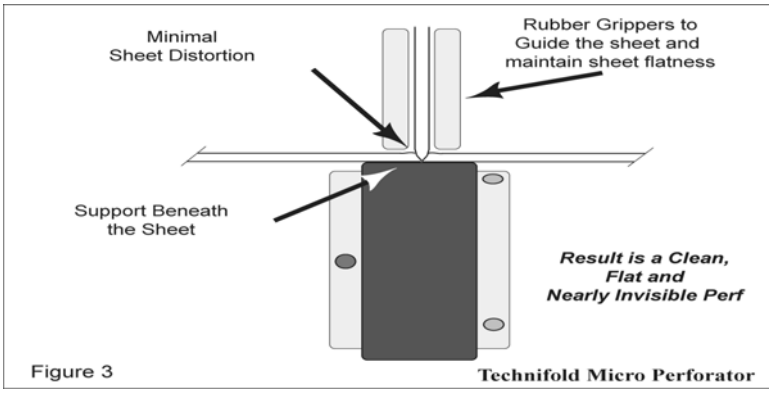
- We found that to accurately manufacture finer blades than 12 teeth per inch was very difficult, in other words the more teeth that were added the more likely they would be to lose their profile
- The tolerances needed for blades, anvils and collars to fit and work perfectly in unison were almost impossible to achieve
- The limitations of tolerance in the shafts where micro-perforating devices are attached worked **against** an ultra precision application
- All defective elements mentioned above led to mid to long term wear or damage to all or some of the components

The evidence was conclusive: Folding manufacturers and small companies searching for a solution to match flatbed micro-perforating are up against the elements mentioned above. After unearthing the difficulties involved in achieving near perfect micro-perforating results **it isn't hard to understand why manufacturers or opportunists may have decided to avoid such hassles**. The rotary method of micro-perforating adopted world-wide that incorporates the overlap of blade against a cutting anvil hides any possible imperfection. There is no quick way of telling if a blade is slightly oval-shaped or under the specified tolerances because it will always penetrate the stock during production. However, **you may measure mid to long term wear by the burred edges that form on the blades or from the amount of broken perf teeth**.

The Tech-ni-Fold Solution

The **Tech-ni-Fold Micro-perforator** was created as a result of extensive market research over many years. Not only does our system produce an array of micro-perf options but it was designed using new technology that adds strength and longevity to the unit, so that it greatly outlasts conventional methods many times over.

The Tech-ni-Fold Micro-perforator is designed to kiss-cut the sheet, and the narrow profile perf blade cuts through only to the bottom of the sheet, not beyond, which also minimises the knife area in actual contact with the sheet, as seen in Figure 3. This means you get a cleaner, finer cut which permits the sheet to lay flat.



Tech-ni-Fold Micro-Perforator blades are break resistant for two reasons:

1. Strong double bevel construction; supporting the blade during the micro-perforating process
2. They cut against a comparatively softer nylon rather than steel; protecting against any damage caused to the micro-perforating blade ensuring a long life span

17, 25 and 52 TPI Tech-ni-fold Micro-Perforating Blades

Tech-ni-fold Perforating Blade alongside an existing manufacturers Blade

The Tech-ni-Fold Micro-perforator is the **only** rotary action solution that replicates the proven micro-perf results that you see come from the flatbed cylinder. The package includes 17, 25 & 52 teeth per inch blades that deal with stock ranges 65-350gsm and a choice of two nylon cutting anvils that greatly minimise blade wear.