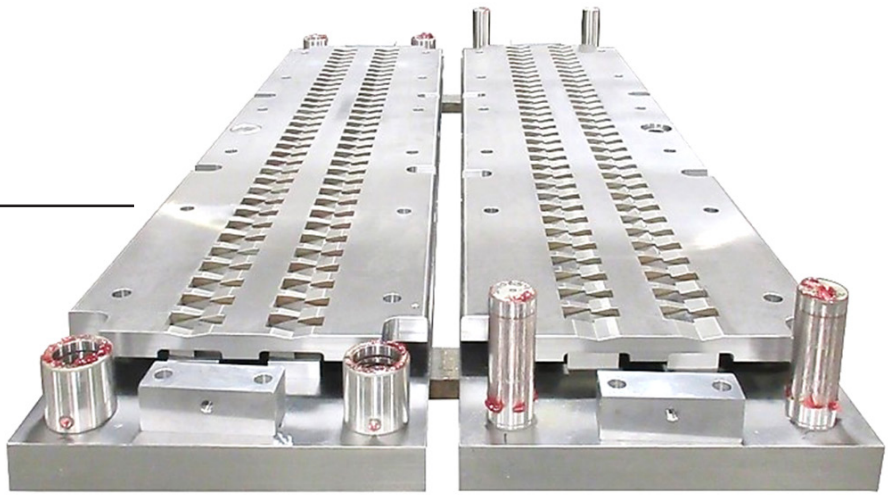
TAPERED T DIE DESIGN

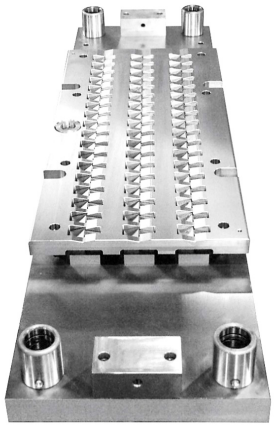
BEHLEN® JOINER

The Tapered T die was developed specifically to reduce downtime due to burrs and fines made during the stitching process. This design also operates consistently and reduces the frequency of maintenance intervals. Significant improvements in productivity and stitch quality have been noted in light gauge materials 0.006” [0.15mm] to 0.080” [2.00mm], especially with aluminum. The Tapered T design also works well with a wide range of materials thicker than 0.080” [2.00mm].

Double Row Tapered T Die with Integrated Hole Punch



KEY FEATURES

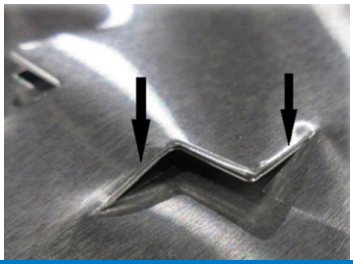


Integrated Hole Punch

Nitrogen Springs

Larger Engagement Tabs

Tapered T Punch

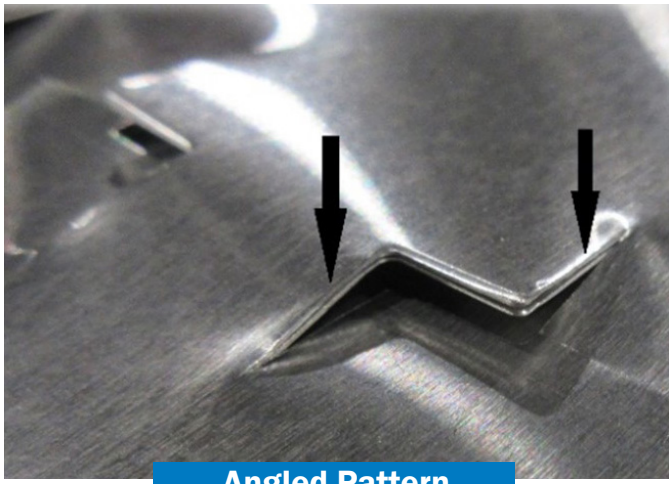


Reduce Scrap & Burrs

SIGNIFICANT REDUCTION OF BURRS & FINES

Here are some of the reasons why the Tapered T makes fewer burrs and fines than other punch designs and why it performs better when joining aluminum.

- Burrs and fines can cause major issues if they migrate down the line and get embedded in urethane rollers or accumulate in other areas in the process which can cause damage to the material.
- Light gauge aluminum is much more susceptible to damage from burrs and fines than other materials such as steel.
- To reduce the amount of burrs and fines the Tapered T punches are designed with tapered sides that lance the two layers of material with an angled pattern.
- This angled pattern enables the cut edges of the two sheets to separate immediately without the cut edges moving in a coincidental manner like what happens with the arrow and standard WRSJ punches.
- When the cut edges move in a coincident manner the two cut edges run against each other and many burrs and fines are pulled off the cut edges.
- The Tapered T strippers are contoured to match the punch contours. These contours clamp the material better during the punching and cutting process, which produces a cleaner more burr-free cut.
- The flat section on top of the Arrow punch is bigger than the flat on top of the Tapered T punch, this results in an average cut length on the Tapered T being 0.50” less than the Arrow. Less cutting means less burrs and fines.
- When the Tapered T pattern stitch starts to shift into lock position the two edges immediately separate due to the angles in the stitch pattern.



Angled Pattern

Contoured Stripper / Punch

BENEFITS OF A LARGER ENGAGEMENT TAB

Here is how the larger tab of the Tapered T can benefit the stitch between materials.

- The amount of offset or size of the engagement tab is much larger than an Arrow stitch. An Arrow stitch has a tab ~0.12” wide while a Tapered T tab is over 0.30”.
- Wider tabs are very helpful when joining hard, stiff, thicker material with a thinner, softer material. For example, a thicker steel to a thinner dead soft aluminum. When these material combinations are present with the Arrow profile, the side tabs on softer material have the potential to get bent up when going around a roller. When that happens, the stitch may fail. Wider tabs on the Tapered T resist being bent up.
- The images show an Arrow stitch shifted and locked and a Tapered T stitch shifted and locked. The images are not to scale, but you can see the difference in the size of the side tabs.

Arrow shifted/locked

Tapered T shifted/locked

DURABILITY OF NITROGEN SPRINGS

Here are reasons why a Tapered T die that utilizes nitrogen springs is more beneficial than dies with urethane springs:

- Dies using urethane springs work well but do wear out and eventually lose spring force. Also, if run long enough, they can break down and crack - then pieces of urethane spring can work out of the die and possibly cause damage to the material.
- The image shows a urethane spring that has broken down. This will not happen with the nitrogen springs.
- The Tapered T die uses self-contained nitrogen cylinder springs. They do not break into pieces, the spring rate is much more uniform, and do not lose spring force for roughly 1 million cycles.
- Nitrogen springs can last 25 times longer than urethane springs.

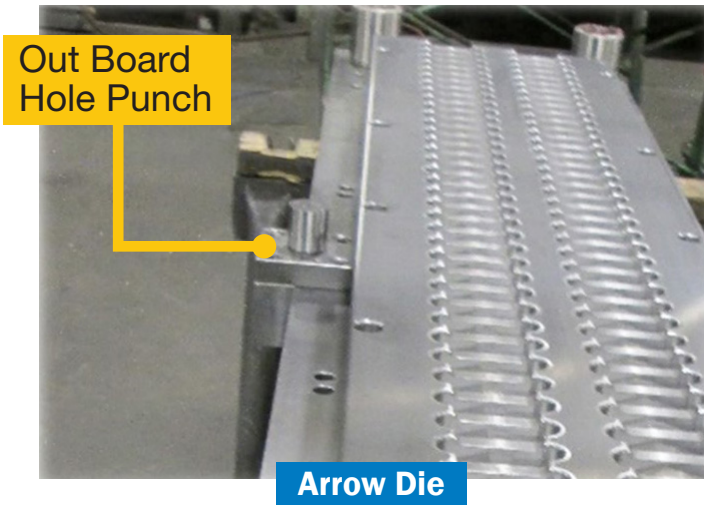
Worn-out Urethane Spring

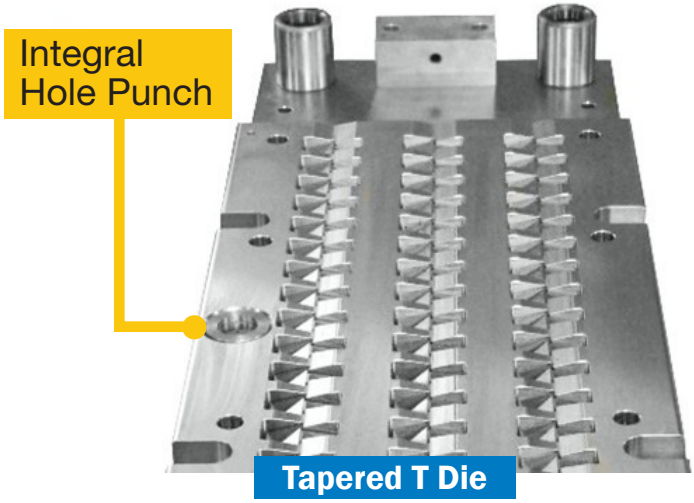
Nitrogen Spring

INTEGRATED HOLE PUNCH

When a hole punch is required, it is integrated into the Tapered T die.

- The hole punch is located inside the die on the Tapered T die as compared to other dies that have the hole punch bolted to the outer edge of the die.
- With other die designs, the hole punch must be removed from the die before the die can be removed through the window on the joiner. The Tapered T die does not require the removal of the hole punch to remove the die.
- The strippers on a two-row Arrow die are 13.63” wide while the strippers on the Tapered T die are 18.0” wide to accommodate the integral hole punch.
- The Tapered T strippers are made from 4140 100-120 KSI alloy steel. Making the Tapered T stripper very strong.





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