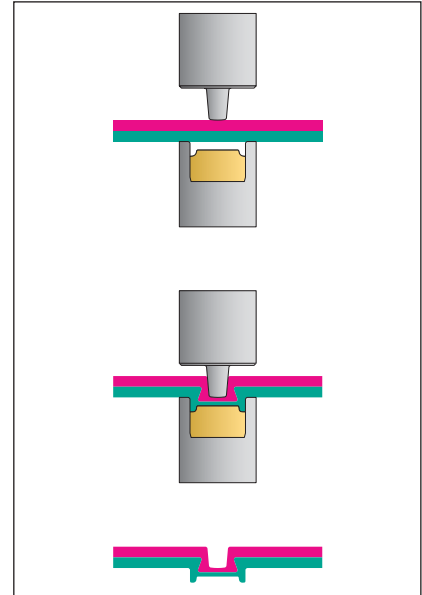


## TOX®-MICROpoint

The new dimension of clinching

Clinch point diameters 1.0 / 1.5 / 2.0 mm



Data sheet 80.81

2010/09

### Advantages of the compact tool dimensions

Slim parts (e.g. < 5 mm) can be permanently joined without alterations to the neighboring area, since the tool dimensions can be maintained very small (e.g. outer diameter of die 4 mm).

Small assembly parts lead, depending on production volume, to fully automated series production using a multipoint die set.



The actual cycle time for the TOX®-MICROpoint clinching process is **less than 0.5 seconds**, thus allowing cycles up to 150 strokes/min in eccentric- or special TOX®-Powerpackage-Presses.

Picture shows: Unloading a contact tab from the tooling (upper punch, lower die) after the clinch process.

### From the individual components to the production station concept



The metal rings are stamped directly from a sheet metal coil. They form the individual pieces for a contact tab of a mechanical switch prior to clinching. The pieces are loaded into a multipoint die set and are clinched together in one cycle with the TOX®-MICROpoint.

The multipoint die set is mounted in a TOX®-Powerpackage-Press. The station consists of standard components from the TOX® modular program adapted to the customer's specifications.

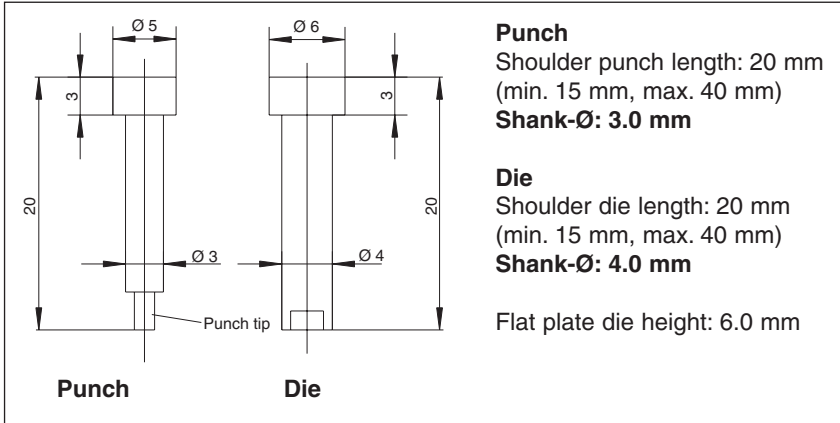
The finished contact tab is assembled in a main isolator switch's.



# TOX®-MICROpoint

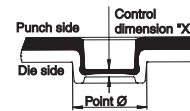
## The strength lies in the detail

### Clinch tooling – standard dimensions



Mounting dimension tolerances are the same as our specifications in data sheet 80.100, which also contains an overview of our stripper systems and the multipoint capabilities of clinching.

#### Unobstructed contour

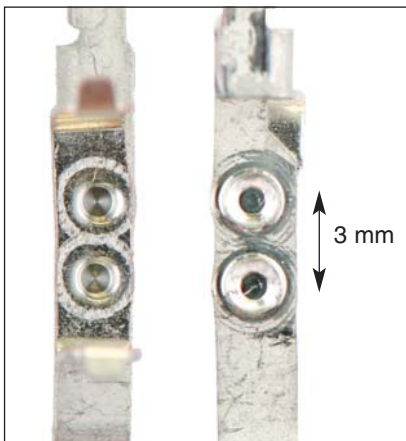


The MICROpoint-Ø is the maximum obstructive outline of the point!

#### Point-Ø: 1.0 / 1.5 / 2.0 mm

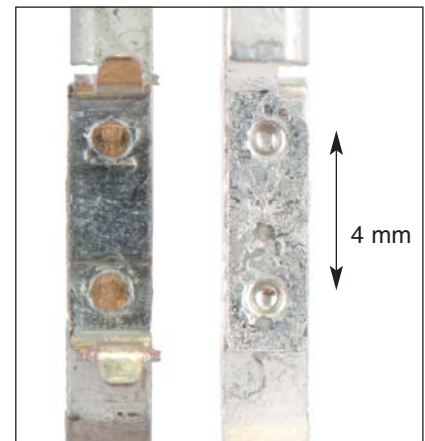
(for larger points, see our standard TOX®-Clinch-Program).

### Highly profitable and environmentally sound effects of the TOX®-MICROpoint in your production



The picture on the left shows two TOX®-MICROpoint joints on a contact tab viewed from the punch side (cavity, left) and from the die side (protrusion, right). The carrier plate is not shown. The surface tin coating remains intact even inside the clinched point. This guarantees good conductivity.

The picture on the right shows the same part, but spot welded. It is clearly visible how the thermal effects have damaged or destroyed the surface coating (reddish color shows the unprotected carrier material). The conductivity is strongly impaired by the scaling and removal of the surface coating.



#### Spot welding:

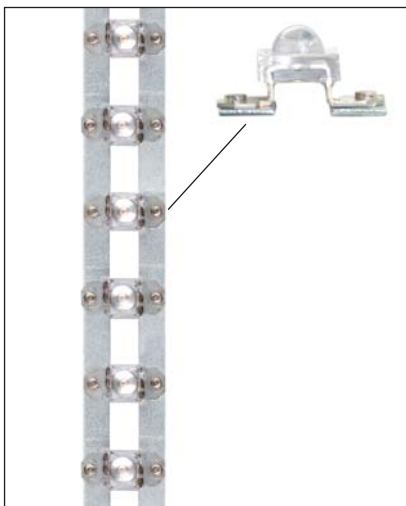
- Damages surface coating
- Impairs conductivity

*Just produced and already rust prone!*

#### Clinching:

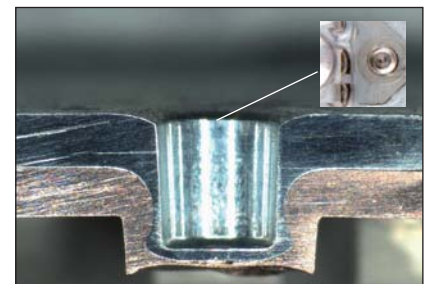
- Coating is preserved
  - Very good conductivity
- Current flows steadily!*

### Solutions for minute details



Single LEDs are clinched onto steel tracks using the TOX®-MICROpoint. The joining of steel and copper is easily accomplished and provides good dynamic retaining strength. The thermal connections done up to now on the electrical assemblies were problematic.

These light strips can be used for example in automobile headlights and rear lights.



Cross section of a TOX®-MICROpoint on the LED strip. The strip is made up of galvanized steel 0.6 mm thick and galvanized copper 0.5 mm thick (point-Ø 2.0 mm). Even this miniature version of the TOX®-Round Point shows the typical interlocking of the clinching process.