

## Technical Note P885T0001, valid for PICMA<sup>®</sup> Multilayer Piezo Actuators

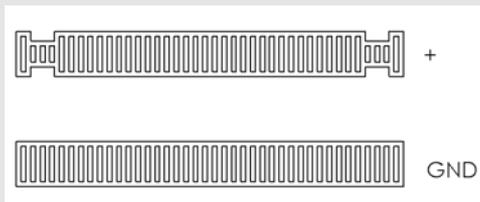
### Soldering PICMA<sup>®</sup> Multilayer Piezo Actuators

#### Attention – Read before Soldering

To avoid contamination, the actuator must never be handled with unprotected fingers, i.e. always use latex or nitrile gloves. The gloves must not be powdered. Use parallel-action non-metallic tweezers to handle the actuator. Use isopropanol to remove oil contaminants.

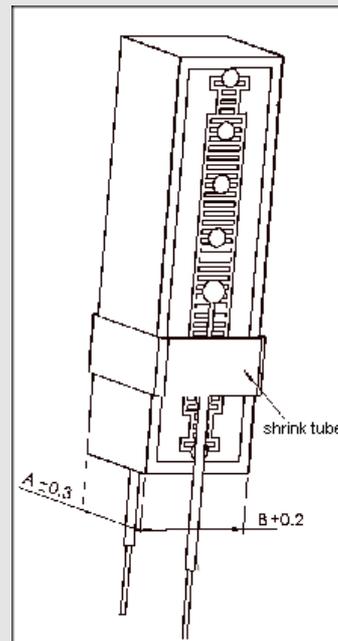
If possible, avoid touching the electrodes at all, i.e. avoid touching the sides of the actuators with the metallic surfaces.

Note that the polarity of the electrodes is reflected in their layout (see figures below).



PICMA<sup>®</sup> electrode layout and polarity

Soldering is permitted at all the pre-tinned points of the electrodes except the outer ones, nearest the top and bottom surfaces.



PICMA<sup>®</sup> stack actuator with wires

Each point of the electrodes may be used for soldering only once. If you have to redo a solder joint, you must use a different (pre-tinned) point.

The electrodes should be shortened during soldering to avoid any electrical charges (pyroelectric effect).

#### The following materials are permissible for the soldering process:

Solder: made of the system L-Sn95..97 Ag3..4 Cu0.5..1.0

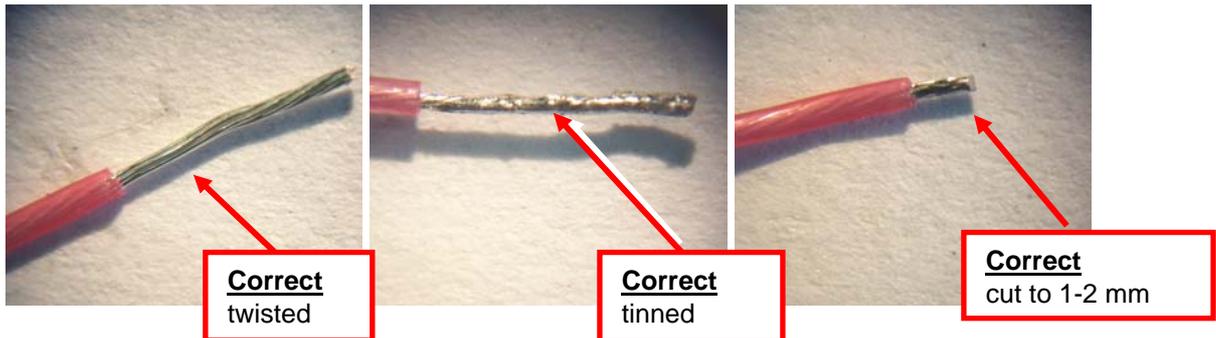
Flux: defined as 1.1.1 or 1.1.3 accordingly to DIN EN 29454 Part 1

or

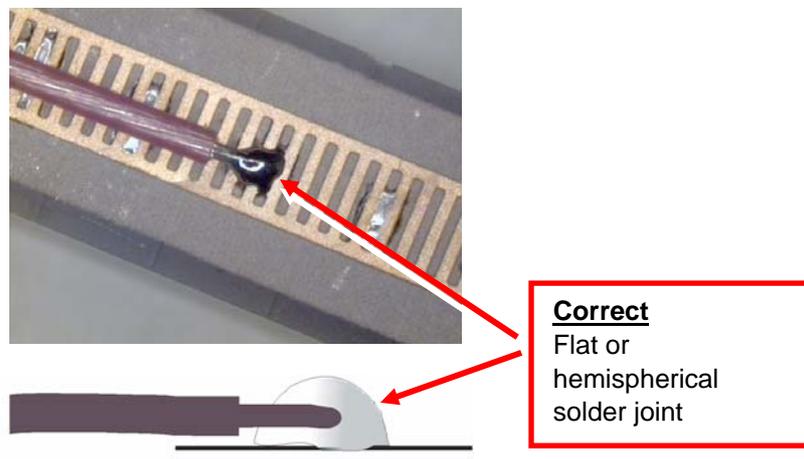
defined as ROLO or ROMO according to ANSI J-STD-004

Proceed as follows:

1. Twist and tin the stripped end of the wire. Trim to 1 - 2 mm. Also tin the soldering tip; during the soldering operation, a small drop of solder must coat the soldering tip.



2. Apply flux to the tinned end and to a (pre-tinned) point on the electrode surface. Hold the wire flat with its end at that point.
3. Coat the soldering tip with a small amount of solder. **The soldering temperature must not exceed the limit of 350 °C (662 °F).** Hold the soldering tip against the tinned end of the wire for 1 to max. 2 seconds, until the solder flows. The solder joint must be flat or hemispherical.



4. Remove flux residues by a cleaning process applying ethanol or a higher alcohol. The use of an ultrasonic bath is recommended.

#### Notes:

- **Be sure that the solder joint is not subjected to “peeling” forces.** For security, a KYNAR heat-shrink tube (approx. 3 mm) can be placed around the solder joint at the PICMA<sup>®</sup> actuator.
- **The maximum temperature for the actuator is 150°C (302 °F).** This limitation also applies to all following processing steps (as well as to operation)
- **Do not file, sand or roughen the sides of the actuator**