

Claims

1. A wire clamp, comprising:

a clamp body;

- 5 a pair of arms coupled to the clamp body; and

a piezoelectric actuator having a longitudinal axis extending between a first end and a second end, the actuator being coupled to the pair of arms at the first end and to the clamp body at the second end;

- 10 wherein the second end of the actuator is coupled to the clamp body by a preload mechanism for applying a preload force along the longitudinal axis, and

wherein the preload mechanism comprises a first movable wedge having an inclined surface which is slidable over a mating inclined surface of a second movable wedge, the inclined surface and the mating inclined surface being configured with an angle of inclination which promotes self-locking between the first and second movable wedges using static friction.

2. A wire clamp according to claim 1, wherein the inclined surface has an angle of inclination which is less than a critical angle required for self-locking.

- 20 3. A wire clamp according to claim 1 or claim 2, wherein the second movable wedge is removable from the clamp body.

4. A wire clamp according to any one of the preceding claims, wherein the preload mechanism is disposed in a gap between the second end of the actuator and the clamp body.

5. A wire clamp according to any one of the preceding claims, wherein the second movable wedge is slidably insertable into a gap between the mating inclined surface and the piezoelectric actuator, or a gap between the clamp body and the mating inclined surface, to apply the preload force.

6. A wire clamp according to any one of the preceding claims, wherein the first movable wedge comprises at least one lug which is engageable to withdraw the first movable wedge from the wire clamp.

7. A method of applying a preload force to a piezoelectric actuator of a wire clamp, the wire clamp comprising a clamp body and a pair of arms coupled to the clamp body, the piezoelectric actuator having a longitudinal axis extending between a first end and a second end and being coupled to the pair of arms at the first end and to the clamp body at the second end; the method comprising the steps of:

 - providing a first movable wedge having an inclined surface;
 - providing a mating inclined surface of a second movable wedge such that a gap is defined between the mating inclined surface and the piezoelectric actuator, or between the clamp body and the mating inclined surface, the inclined surface of the first movable wedge being slidable over the mating inclined surface of the second movable wedge, the inclined surface and the mating inclined surface being configured with an angle of inclination which promotes self-locking between the first and second movable wedges using static friction;
 - inserting the first and second movable wedges into the gap such that the inclined surface contacts the mating inclined surface; and
 - applying a force to the first and second movable wedge in a direction transverse to the longitudinal axis of the actuator to thereby apply a preload force along the longitudinal axis.
8. A method according to claim 7, further comprising the step of mounting the wire clamp in a jig.
9. A method according to claim 8, wherein the jig comprises a tensioning screw, and wherein a tip of the tensioning screw is contactable with the first movable wedge such that tightening the tensioning screw applies the force to the first movable wedge.
10. A method according to any one of claims 7 to 9, further comprising the step of determining the preload force.
11. A method according to claim 10, wherein the step of determining the preload force comprises measuring a separation distance between the arms.
12. A method according to claim 11, wherein the arms comprise at least one fiducial marking, and wherein the step of measuring the separation distance comprises

comparing a position of the at least one fiducial marking before applying the force to a position of the at least one fiducial marking after applying the force.

13. A jig for applying a preload force to a piezoelectric actuator of a wire clamp, the wire clamp comprising: a clamp body and a pair of arms coupled to the clamp body, the piezoelectric actuator having a longitudinal axis extending between a first end and a second end and being coupled to the pair of arms at the first end and to the clamp body at the second end, the second end of the piezoelectric actuator being coupled to the clamp body by a preload mechanism for applying a preload force along the longitudinal axis, the preload mechanism comprising at least one wedge having an inclined surface which is slidable over a mating inclined surface; the jig comprising:
 - a clamp support having a recess to receive the clamp body;
 - a tensioning platform extending from the clamp support and being elevated relative to the recess, the tensioning platform having a threaded bore which, when the clamp body is received in the clamp support, is aligned with the at least one wedge; and
 - a tensioning screw receivable in the threaded bore such that a tip of the tensioning screw contacts the at least one wedge, and such that tightening of the tensioning screw applies a force to the at least one wedge in a direction transverse to the longitudinal axis of the piezoelectric actuator.