

WHAT IS CLAIMED IS:

1. A flow sensor sub-assembly for sensing flow of a fluidic medicament comprising:

a flow tube having an inlet and an outlet;
a first coupler secured to the inlet of the flow tube;
a second coupler secured to the outlet of the flow tube;
a first piezo element secured to the first coupler;
a second piezo element secured to the second coupler to define a predetermined distance between the first piezo element and the second piezo element; and
at least one absorber sleeve engaged with the first coupler, the flow tube, and the second coupler.

2. The flow sensor sub-assembly of claim 1, wherein the at least one absorber sleeve comprises a first absorber sleeve engaged with the first coupler and the flow tube and a second absorber sleeve engaged with the second coupler and the flow tube, the first absorber sleeve spaced from the second absorber sleeve to define a gap.

3. The flow sensor sub-assembly of claim 2, wherein the flow tube is not covered by any absorbing material in the gap between the first absorber sleeve and the second absorber sleeve.

4. The flow sensor sub-assembly of claim 2, wherein the first absorber sleeve and the second absorber sleeve each cover at least 10% of a length of the flow tube between the first and second couplers.

5. The flow sensor sub-assembly of claim 4, wherein the first absorber sleeve and the second absorber sleeve each cover 25% of the length of the flow tube between the first and second couplers.

6. The flow sensor sub-assembly of any of claims 1-5, wherein the at least one absorber sleeve comprises a thermoplastic polyurethane and the flow tube comprises stainless steel.

7. The flow sensor sub-assembly of any of claims 1-6, wherein the flow tube is secured to the first coupler and the second coupler via the at least one absorber sleeve.

8. The flow sensor sub-assembly of any of claims 1-7, wherein an interface between the first and second couplers and the flow tube is free from adhesive.

9. The flow sensor sub-assembly of any of claims 1-8, wherein the at least one absorber sleeve is press-fit to the first and second couplers and the flow tube.

10. The flow sensor sub-assembly of any of claims 1-9, wherein the at least one absorber sleeve is adhered to the first and second couplers and the flow tube.

11. The flow sensor sub-assembly of any of claims 1-9, wherein the at least one absorber sleeve is overmolded onto the first and second couplers and the flow tube.

12. A flow sensor sub-assembly for sensing flow of a fluidic medicament comprising:

a flow tube having an inlet and an outlet;

a first coupler secured to the inlet of the flow tube;

a second coupler secured to the outlet of the flow tube;

a first piezo element secured to the first coupler;

a second piezo element secured to the second coupler to define a predetermined distance between the first piezo element and the second piezo element; and

at least one absorber sleeve, wherein the flow tube is secured to the first coupler and the second coupler via the at least one absorber sleeve.

13. The flow sensor sub-assembly of claim 12, wherein the at least one absorber sleeve comprises a first absorber sleeve engaged with the first coupler and the flow tube and a second absorber sleeve engaged with the second coupler and the flow tube, the first absorber sleeve spaced from the second absorber sleeve to define a gap.

14. The flow sensor sub-assembly of claim 13, wherein the flow tube is not covered by any absorbing material in the gap between the first absorber sleeve and the second absorber sleeve.

15. The flow sensor sub-assembly of claim 13, wherein the first absorber sleeve and the second absorber sleeve each cover at least 10% of a length of the flow tube between the first and second couplers.

16. The flow sensor sub-assembly of claim 15, wherein the first absorber sleeve and the second absorber sleeve each cover 25% of the length of the flow tube between the first and second couplers.

17. The flow sensor sub-assembly of any of claims 12-16, wherein the at least one absorber sleeve comprises a thermoplastic polyurethane and the flow tube comprises stainless steel.

18. The flow sensor sub-assembly of any of claims 12-17, wherein an interface between the first and second couplers and the flow tube is free from adhesive.

19. The flow sensor sub-assembly of any of claims 12-18, wherein the at least one absorber sleeve is press-fit to the first and second couplers and the flow tube.

20. The flow sensor sub-assembly of any of claims 12-19, wherein the at least one absorber sleeve is adhered to the first and second couplers and the flow tube.