

Project Design Specification—Bronchoalveolar Lavage Trap

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Function:

The purpose of the bronchoalveolar lavage trap is to collect a fluid sample from a bronchiole using a lighted bronchoscope attached to a suction unit. The trap should be stable, rigid, cost-effective, able to hold at least 35 mL of sample and must capture and prevent the sample from being pulled into the trash trap. It should also be secure when closed and able to withstand transportation to fit the criteria of medical specimen receiving laboratories.

Client Requirements:

- Cost Efficient
- Plastic
- Avoid latex
- Gradations of volume
- Must hold at least 35 mL
- Cannot be attached to bronchoscope handle

Design Requirements:

- 1) Physical and Operational Characteristics
 - a) *Performance requirements* – Must be able to contain sample despite bronchoscope movement.
 - b) *Safety* – Must be sealed tight and a durable container
 - c) *Accuracy and Reliability* – Should be able to repeat procedure with little or no deviation.
 - d) *Life in Service* – One-time use, must be able to withstand transportation and contain sample for at least 6 hours.
 - e) *Shelf Life* – Able to withstand a basic medical storage environment.
 - f) *Operating Environment* – Must be able to withstand 300 mm Hg.
 - g) *Ergonomics* – Should not interfere with regular procedure.
 - h) *Size* – Must hold at least 35 mL of fluid.
 - i) *Weight* – Should be as light as possible.
 - j) *Materials* – Cost-efficient, no latex or glass, plastics preferred.
 - k) *Aesthetics* – Should be transparent.
- 2) Production Characteristics
 - a) *Quantity* – One, but should be designed with the intent of mass production in the future.
 - b) *Target Product Cost* – Under \$10
- 3) Miscellaneous
 - a) *Standards and Specifications* – Should not lose the sample.
 - b) *Customer* – Medical Community

- c) *Patient-related concerns* – Not include latex to avoid problems with latex allergies.
- d) *Competition* –Current traps lose sample easily.