

Test Lungs An Overview



Many simple as well as adjustable test lungs were developed over 30 years ago and are used in the market in the same form today. This market overview offers you a peak into the world of test lungs by reviewing the positives and negatives of the various test lungs available and evaluating their areas of application.

Market Overview & Test Lung Functionality

Simple, unadjustable, plastic test lungs are by far the most well-known and distributed on the market. Basic ventilator functionality tests can be run using these simple, unadjustable test lungs. However, many ventilator manufacturers recommend an adjustable test lung for serious, complex ventilator testing – especially in the areas of infant and neonatal ventilation.

Adjustable Test Lung

An assortment of adjustable test lungs with various applications are available. These include “trapeze stand” test lungs that have been manufactured in the same form for the past 30 years – no updates or modifications. Other test lungs adjust the compliance with a “feather system”.

The imtmedical SmartLung

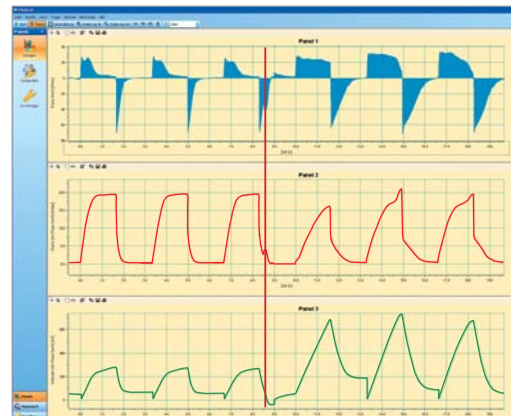
imtmedical's SmartLung presents a completely new solution for adjustable compliance (lung hardness) and resistance (airway resistance) func-

tion test lungs by offering a compact, light construction that greatly facilitates your daily work. By significantly reducing purchasing costs, we were also able to make the SmartLung extremely affordable compared to other adjustable test lungs.

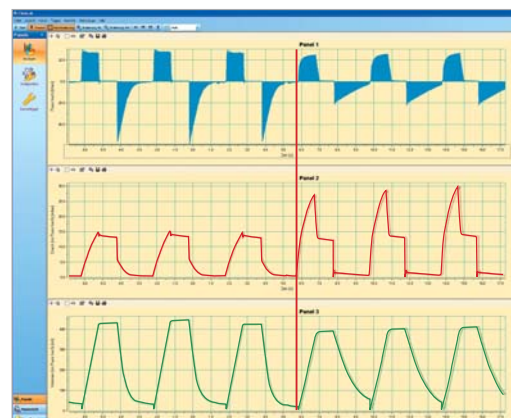
High-end test lungs allow measurements to be recorded directly on the test lung. Combining the SmartLung with the imtmedical FlowAnalyser and FlowLab software offers the same capabilities.

Patient Condition Simulations

All test lungs used for more than a routine function check require an adjustable compliance and resistance. Only by assessing these values can changes in a patient's condition be evaluated. The flow, pressure and volume curves in the FlowLab illustrations to the right show clearly the effected factors with a compliance change from 15 to 30 mL/mbar and a resistance change from 5 to 50.



Flow, pressure and volume with pressure controlled ventilation (compliance from 15 to 30)



Flow, pressure and volume with volume controlled ventilation (resistance from 5 to 50)

How does the doctor or anaesthesiologist react when the required volume can not be applied to the patient by the ventilator? Do they notice that the resistance is too high and that the pressure needs to be increased? Similar situations can only be simulated if the test lung can be adjusted with these parameters.



Characteristics of an Adjustable Test Lung

A professional test lung allows the resistance (airway resistance) to be adjusted in a range from 5 mbar/L/s to 200 mbar/L/s. Depending on the application, lung compliance must also be adjusted between 1 mL/mbar and 30 mL/mbar. Additionally, an adjustable leak must be available in order to simulate leaky tubes, mask leaks or incorrectly attached ventilation systems.

