

## Suction Alone Makes a Vacuum Work Well

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Actually, it's the entire vacuum system that makes it effective - or not.

### A) Airflow

Airflow is the amount or volume of air moving through the vacuum, usually measured in cubic feet per minute (CFM). The amount of air moving through a vacuum affects the amount of soil that can be carried along by the airflow and contained in the vacuum's filtration. Airflow is demonstrated simply by placing your index and middle finger into the vacuum, the movement of air that you feel passing by your fingers is Airflow and referred as CFM.

### B) Waterlift

Lift, also known as static lift or water lift, is the ability of the vacuum's airflow to lift dirt or liquid. It is typically measured in "inches of lift" determined by how many inches the vacuum cleaners airflow can pull water up a tube in a lab test.

A more common example used is the ability of a vacuum motor to raise water (at sea level) through a 1.5" tube.

#### *Example:*

A vacuum cleaner that produces a 90" of water lift would raise water in a column 90" high. It's that simple.

A simple device we produced in-house to measure waterlift was built for verifying performance of various cleaners. We simply placed a 1.5" x 18' section of clear PVC pipe into a five gallon pail filled with water. We attached the vacuum hose on the other end of the PVC pipe, turned on the vacuum cleaner and measured how high it would raise water in the pipe.

We verified over six different makes and models of vacuums to verify performance. Most models we tested ranged from 85-185" of waterlift and all models performed to the specifications of the manufacture.

Remember, waterlift is what you *feel* when you place your hand over the end of the hose with the vacuum running, that's water lift.

High waterlift numbers are best implemented when choosing a vacuum for pickup of liquids or heavy bulk material.



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## The Venturi Principle

The Venturi Principle is an important bit of science to understand. Basically, the Venturi Principle causes air velocity to increase as the corridor it passes through narrows. That explains the effectiveness of suction-only backpacks or canisters that use a narrow tool opening or orifice enabling greater suction, versus some upright machines that have a very wide tool orifice to accommodate the rotating brush, thus reducing air velocity and cleaning effectiveness.

The best vacuums reach an effective compromise, enabling effective cleaning of plush carpet by proportioning the orifice opening and beater brush to allow the rotating brush to perform well while maintaining proper airflow and lift to remove soil and prevent airborne contaminants.

The most popular vacuum motors used today in commercial vacuum cleaners and carpet extractors



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