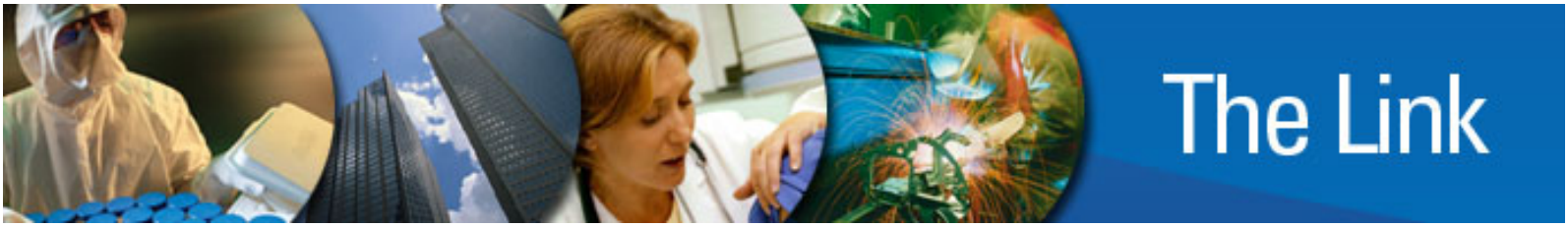

February 13, 2008 VOLUME 6 ISSUE 2

Can Backpacks Pass the Test?

By Kyle McCabe, Tornado

Backpack vacuum cleaners have been available for more than a decade and have gradually grown in popularity. But, in recent years, these machines have become smaller, lighter and more comfortable to use, while many have also maintained, if not enhanced, their power and performance.

Yet, it appears many users still have reservations about backpack vacuums, and one of the biggest concerns is that they simply cannot remove soil from carpets as effectively as a conventional upright vacuum cleaner. The main reason, users believe, is that most uprights have a "beater-bar," which helps agitate the carpet, allowing dust, dirt, and soils to be easily loosened and vacuumed up.

However, is this truly the case? Are uprights more effective at removing deeply embedded soils? Studies*, under real-life conditions, appear to not only dispel these concerns, but also indicate backpacks may actually perform *more* effectively than upright machines.

First, some clarifications are in order. The subjective appearance of the carpet after cleaning does not determine soil removal effectiveness. Instead, a known, pre-measured concentration of soil is applied and then vacuumed from a carpet. The soil is captured in the vacuum cleaner's filter bag and then measured once again. This before-and-after measuring helps determine how much soil was actually removed from the carpet.

The amount of soil removed from a carpet is important for a variety of reasons. A cleaner carpet is a healthier carpet because with less dust, dirt and soil, health and indoor air quality are protected. Additionally, the life expectancy of the carpet is increased, sometime significantly. Soil works its way into carpet fibers, gradually tearing the fibers away. Because carpeting can be a major, costly investment for a facility, the longer the carpet lasts, the more economic benefit for the building owners.

Putting the Backpack to the Test
To test the effectiveness of a backpack machine, 100 grams of test soil, made up of sand and talcum powder, was evenly distributed over a six-foot by six-foot commercial carpet. The soil was then "raked" into the carpet, which helped evenly spread the soil over the carpet and allowed the soil to penetrate deeper into the carpet fibers. This simulated what would happen if scores of people walked over the carpet during a normal business day.

The carpet was vacuumed for sixty seconds – first, with a backpack machine and then repeated with a conventional upright machine. Before and after each

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vacuuming, the filter bags on both machines were weighed to calculate how much soil, in terms of weight, was removed after vacuuming.

These were the results:

- **The backpack received a soil removal effectiveness rating of nearly 96 percent, indicating that nearly 96 percent of the 100 grams of test soil had been vacuumed up and retained in the filter bag.**
- **By comparison, the upright had a 94 percent soil removal effectiveness rating.**
- **The tests were repeated and both machines achieved results in the same range, with the backpack machine slightly edging out its upright competitor in each comparison.**

What We Learned
The tests tell us several important facts. First, both machines performed well. They did effectively remove almost all of the soil from the carpets.

However, what is significant is that the test dispelled one of the primary concerns about backpacks: they do not perform as well compared to an upright. Indeed, the tests prove that not only do they perform as well as an upright, but they actually perform slightly better.

The reason for this appears to be the high airflow at the point of carpet contact. According to the researchers, airflow is more concentrated with the backpack, which helps it successfully trap and then remove dust and soil. Therefore, when it comes to cleaning effectiveness, uprights are no longer the only option. This, and the fact that newer backpacks have been tested and can clean as much as 7,000 square feet in an hour, may make backpacks a better option for cleaning professionals.

Kyle McCabe is an engineer with Tornado, www.tornadovac.com, a leading manufacturer of professional cleaning equipment including backpack vacuum cleaners.

***Test conducted by Quality Environmental Services and Technologies, Inc., Denver, Col.**

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