



THE DEVILBISS VACUAIDE® COMPACT SUCTION UNIT

by Joseph Sorbello RRT, M.Ed.

The DeVilbiss VacuAide® Compact Suction Unit lives up to the DeVilbiss good name as regards quality, performance and design. The company website touts this unit by stating "Now the safety and performance advantages (of DeVilbiss products) are built into the compact DeVilbiss VacuAide, designed to fit the active lifestyles of today's customers." I would agree: it's a compact and well-built suction unit contained in a convenient carrying bag that provides discrete suction "on the go."

What impressed me right away about this suction unit was its design. Weighing in at only 3.37 lbs with physical dimensions of only 7.25"X6.75"X7.25" its small footprint and incredible light-weight sent it to the top of my excellence list right off the bat. Its other specifications such as its impressive vacuum pressures of 50-550 mm HG; (meets American Association for Respiratory Care guidelines for neonatal, infant, and adult homecare suctioning (see AARC Clinical Practice Guidelines at www.aarc.org) are equally impressive and ideal for home, alternate site and use in travel.

The unit shipped to me included the basic unit with bacteria/inline filter and with a collection bottle attached. It also had an internal battery already inserted in the back of the unit. It also came with a 110 volt power cord with AC to DC adapter for power from any wall outlet, a 12 volt DC power cord (for cigarette lighter type outlets), a 6 foot long section of suction tubing, a user manual (English, Spanish, French, German, Italian, Dutch) and a sturdy, handsome carrying case.

The top of the unit contains all functional controls and displays including an easy-to-read LED bar graph gauge that displays the suction/vacuum pressure, particularly important for neonatal/pediatric patients. The unit is easy to assemble/disassemble for initial and subsequent use, for trouble-shooting and for part(s) replacement, including battery replacement, if necessary. By the way, the battery is contained in the rear, accessed by unscrewing a single, large plastic screw (using any coin). A universal-type icon array on the panel just to the right of the LED suction bar graph display also helps users to quickly identify and facilitate function:



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- A thumb-size black-on-green push-and-click ON/OFF button is to the far right with the following indicators between that button and the bar graph:
 - Low Battery, which illuminates in RED when the battery reaches a discharge state.
 - Battery Charging, which illuminates in YELLOW
 - External Power, supplied from the AC or DC power cord, which illuminates in GREEN when power is supplied.
- The suction level (mmHg) setting display also illuminates in GREEN.

The suction control located on the top left side of the unit just to the left of the suction display is a 1.5" diameter bright ORANGE knob with eight equally spaced depressed finger holds for ease of control. A clever white indicator also shows the pressure direction (increase or decrease) on the knob's face. One inch below this is the power cord attachment, a one-prong female receptacle to which the 90 degree connection male power cord connects. The bacteria filter is in-line with a generous 700 ml capacity collection bottle, which is held securely in a 3-sided holder in the front of the unit. The bacteria filter has a float valve, which prevents backflow into the unit.

The unit is very travel-friendly and fully meets the latest RTCA/DO 160D (Aircraft Standard for Environmental Conditions and Test Procedures for Airborne Equipment (see <http://www.rtca.org/> for more documentation on testing and standards). The unit has been manufactured and tested to the ISO10079-1:1999 Standard for Suction Equipment, earning exceptional performance ratings in the following test areas:

- Electromagnetic Compatibility Test: "VacuAide® doesn't interfere with, nor is it susceptible to, interference from other equipment such as mechanical ventilators."
- Drop Test and Shock Vibration Test: "VacuAide® is much less likely to be damaged when dropped or shipped"
- Excessive Temperature Test: "VacuAide® works very well in

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a wide range of environmental temperatures.”

- Collection Canister and Tubing Collapsibility Test Vibration Test: “The Devilbiss reusable, autoclavable canister provides reliable and consistent performance”

To try and replicate such performances I placed the device next to, on top of and under such devices as radios, computers, a TV, mechanical ventilators, oxygen analyzers, oxygen concentrators, and air compressors. There was no interference with, or difference in performance of these devices with the VacuAide® that I could detect. Subsequently, I took a walk around our department with the VacuAide® treating it with less care than I would normally, knocking it around a bit and even dropping it a few times from 2-3 feet onto our laboratory floor. It worked flawlessly even after this mistreatment.

I then left the VacuAide® in my below-freezing car overnight, then, in the morning I plugged the unit into my vehicle’s cigarette lighter outlet and tested it, literally in sub-zero conditions. Same result: flawless performance.

So, what is “performance” for a portable suction unit? To find out, I used a viscous substance (heavy corn syrup) along with other substances of various viscosities while observing the units vacuum pressures. In my mind, the performance of a suction unit, particularly one which is electrically powered, lies in its ability to reliably and consistently eliminate whatever is in the patient’s airway, whether that airway be natural or artificial maintaining its set pressure in the system despite any problems downstream. Short of human experimentation, I suctioned various materials of different viscosities through

both 8.0 and 4.0 mm ID endotracheal tubes using appropriately sized suction catheters, a Yankauer tonsil suction device and disposable straight type and inline, suction catheters. Although the “secretion removal time” was, as expected, increased for fluids and substances that were thicker, the removal of the “secretions” was completed successfully with the help of the basin of saline or water we normally use to clear catheters between “passes.” Suction was maintained at the set negative pressure and didn’t waiver.

As I’ve said before in other equipment evaluations, the real test of a device’s worth lays in the evaluations of its end-users: the patient(s) and the patients’ caregivers. A good website for patients, caregivers and health care personnel is the following site: WebWhispers.org. One there, look under “Portable Suction Machines”. The author (a patient named Dick) of this particular testimonial uses the VacuAide® and states the following “As far as suction machines, I use the Vacu Aid. It operates off AC until I unplug the AC line from the machine, at which time it automatically converts to DC. All that is needed is a small container of water to flush the intake tube. Mine was provided by Lincare and Medicare pays for it. I hope this helps someone, it has been a great help to me. (Dick)”

I, too, am pleased to recommend this product to those looking for a sturdy and reliable portable suction device that has every desirable feature; not the least of which is its excellent performance.

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