

“smelly” duct tape are harmful or not. That is a question for others to answer. But we do know that a typical mixture of VOCs in the modern home, office and school environment do impact our cognitive performance [1] as well as having the potential over time to produce health problems [2].

Table 1 is a listing of the substances Build Equinox has tested to date, ordered in terms of “High”, “Medium”, “Low”, and “No” VOC detection by our CERV VOC sensor. The ranking of a substance as high, medium, low or no is based on our judgement. You should know our judgment is very good because we have measured VOCs in more homes for a longer time than almost anyone else.

We use a 41 quart size, covered polypropylene container to test substances. The container is intentionally not well-sealed in order to create a space with some level of infiltration and dilution during the test period. A CERV VOC sensor is placed in the container and connected to a data recorder. We tested the empty container, too. The polypropylene test box did not emit a VOC level detectable by the CERV, which is nice to know because polypropylene is a polymer commonly used for food containers (eg, plastic milk jug bottle caps) and toys (hula hoops).

A “High” rating occurs due to either a high peak VOC sensor reading, or a steep increase of the VOC sensor output after a sample is added to the test container. A sample of isobutane, for example, does not elevate the VOC sensor output to its highest level because we use a small sample (butane is highly flammable and can be explosive!). The steep rise of the VOC sensor output, however, indicates that the sensor is very sensitive to isobutane. What is isobutane? It is a common aerosol can propellant used to spray other chemicals (paints, cleansers, etc). Some test materials, such as liquids, have a very high VOC content that builds more slowly to a very high VOC sensor reading. A “Medium” level is less than a “High” level, while a “Low” level indicates there is some VOC detection, but either the pollutant emission rate from the sample is low, or the amount of pollutants in the sample that can be volatilized is low.

We hope this information is useful to you. Check back often to see new listings added to our list. We welcome suggestions from you, too. Are there some substances that you would like to know about? If so, we’ll add it to our list and do our best to test it.

[1] Joseph G. Allen, Piers MacNaughton, Usha Satish, Suresh Santanam, Jose Vallarino, and John D. Spengler; “Associations of Cognitive Function Scores with Carbon Dioxide, Ventilation, and Volatile Organic Compound Exposures in Office Workers: A Controlled Exposure Study of Green and Conventional Office Environments”; Env Health Perspectives; Oct 2015

[2] Formaldehyde Chemical Summary, US Environmental Protection Agency, Toxicity and Exposure for Children’s Health; www.usepa.gov/teach/

Table 1 “High” to “No” listing of VOC substances that the CERV can detect.

Substance	Form	VOC (N/L/M/H)	Comments
Acetone	liquid	H	4g in ceramic bowl
Ajax "triple action" dish detergent	liquid	H	4g in ceramic bowl
Bourbon 80 Proof	liquid	H	4g in ceramic bowl
Easy-Off No Fume Oven Cleaner	liquid	H	4g in ceramic bowl
Human Breath	gas	H	2 breaths exhaled into test box
Isobutane	gas	H	6" diameter balloon released into box; common aerosol propellant
Isopropyl Alcohol (50%)	liquid	H	4g in ceramic bowl
Murphy Oil Soap	liquid	H	4g in bowl, "Tall" Oil Fatty Acid and potassium hydroxide
Office Max "Gasduster"	gas	H	6" diameter balloon released into box; aerosol for cleaning computer keyboards; also called 1,1-difluoro-ethane and refrigerant R152a
Pine-Sol	liquid	H	~ 4g of cleanser in a ceramic bowl
Renuzit Super Odor Neutralizer	liquid	H	~4g in ceramic bowl
Staples Blue Marker	liquid	H	cap removed from permanent marker
Walgreens Lighter Fluid	liquid	H	4g of lighter fluid (naphtha; petroleum distillates) in ceramic bowl
Windex	liquid	H	~8g in ceramic bowl
Zep Heavy Duty Foam Degreaser	liquid	H	4g of foam in ceramic bowl
Chlorox (6% sodium hypochlorite)	liquid	M	4g in ceramic bowl
ipg Duct Tape	solid	M	30ft of 2" wide tape; noticeable odor
Sun "oxy" gen dish detergent	liquid	M	4g in ceramic bowl
White Vinegar	liquid	M	~4g in ceramic bowl
Dirty teeshirt and socks	solid	L	worn for one day
Laminate Countertop	solid	L	52g laminate covered particleboard
Max Block 30SPF Sunscreen	liquid	L	4g of sunscreen in ceramic bowl
Sauder Bookshelf "B"	solid	L	36g of low density particleboard from bookshelf
Sauder Bookshelf "C"	solid	L	50g of high density particle board; low reading but higher than part
Shaw Laminate Floor	solid	L	16g of glueless (floating) laminate floor materials
Vinyl Floor Tile	solid	L	12" x 12" Peel-n-stick vinyl tile with adhesive back exposed
Hydrogen Peroxide (3%)	liquid	N	4g in ceramic bowl
Polypropylene	solid	N	Empty plastic tub used for VOC measurements. No measurable TVOCs with CERV sensor.
Scotch 395 Duct Tape	solid	N	80 sq in of duct tape
Scotch Packaging Tape	solid	N	80 sq in of heavy duct packaging tape
Water	liquid	N	no noticeable reading, but humidity increase due to water can mobilize other VOCs