



Septic Systems and Low-Flow Fixtures

Q. *Can low-flow fixtures cause any problems with residential septic systems?*

A. *Jennifer Hause responds:* For the most part, there are few problems with septic systems associated with the use of low-flow fixtures. While it's true the wastewater is more concentrated, the increase in pollutants will likely be insignificant in existing septic systems that were sized for older fixtures (problems only arise when you get a flow reduction of 20% or more for a given amount of effluent).

More often, the use of low-flow fixtures is a benefit to a septic system because it helps reduce the size of the drain field and reduces "hydraulic overloading" of septic tanks. Excessive amounts of water in the system, typically from laundry, toilet flushing, and bathwater, commonly cause undersized septic tanks to overflow, sending solids and pollutants on to the disposal field. Using low-flow fixtures can offset these heavy amounts of wastewater, so the system operates properly. Under optimal conditions, you want wastewater to stay in a septic tank one to two days. This allows the solids to settle, the scum (including fats and greases) to rise, and pollutants to gradually decompose, allowing a partially clarified effluent to flow on to the drain field.

Any new septic system should be properly sized to handle whatever wastewater loading is expected. At the very least, most states require a minimum septic tank size (ranging from 500 to 1,000 gallons). Some states may require the septic tank to be sized to hold a certain number of gallons per bedrooms (often about 250 gallons per bedroom). Similarly, the drain field must be sized according to on-site soil conditions (based on the results of a percolation test) and the expected waste flow.

Jennifer Hause is a wastewater engineer with the National Small Flows Clearinghouse at the Environmental

Services Division of West Virginia University (800/624-8301). Callers may ask to speak with any of the wastewater engineers available, 8 a.m. to 5 p.m. EST.

Vapor-Retarder Paints

Q. *Do "vapor-retarder paints" really work? Can I rely on them as the sole vapor barrier in an old house? If so, can you recommend some brand names?*

A. *Ned Nisson responds:* Vapor-retarder paints definitely work when applied on the warm side of insulated walls, and are especially well suited for existing homes without an installed vapor barrier. The

accompanying Source of Supply lists several available brand-name paints.

Vapor-retarder paints typically have a perm rating of .8 to .45, but the actual perm in the field depends on the number of coats and the degree of coverage. A material's perm rating indicates the ability to diffuse moisture through the material. The lower the perm rating, the better a material's resistance to moisture diffusion. Any material with a perm rating of one or less is considered a vapor retarder.

While a vapor-retarder paint doesn't have a perm rating as low as 6-mil poly (at about .06), it still qualifies as a vapor

Low-Permeability Paints

Aspen Paints
1128 S.W. Spokane St.
Seattle, WA 98134
206/682-4603
401 Vapor Guard latex wall primer

Benjamin Moore
51 Chestnut Ridge Rd.
Montvale, NJ 07645
201/573-9600
260-00 Moore Craft Vapor Barrier latex wall primer

Fuller O'Brien
395 Oyster Point Blvd.
Suite 350
South San Francisco, CA 94080
415/871-6060
220X5373 latex wall primer
220-20 latex wall primer

Glidden Paint Co.
925 Euclid Ave.
Cleveland, OH 44115
216/344-8000
Insul-Aid latex wall primer

Miller Paints
317 S.E. Grand Ave.
Portland, OR 97214
503/233-4491
1545 Vapor-lok latex wall primer

Palmer Industries
10611 Old Annapolis Rd.
Frederick, MD 21701
301/898-7848
86001-Seal Vapor Barrier non-toxic modified latex primer

Rodda Paint
6932 S.W. Macadam
Portland, OR 97219
503/245-0788
7900 Vapor Block latex wall primer

Sherwin-Williams
See Yellow Pages under "Paint-Retail" for a local distributor
Vapor Barrier 154-6407 latex wall primer

Note: This list includes common low-permeability latex wall primers suitable for interior use. In addition to these products, just about any alkyd paint or a pigmented shellac sealer can be used to create an effective vapor retarder.

retarder, and if applied properly, the paint will slow the transmission of vapor through walls and ceilings sufficiently for most situations. Proper application means full coverage of at least one uniform coat (two coats would be better).

Vapor-retarder paints do have some limitations, however. In extremely cold climates, such as you find near Fairbanks, Alaska, or on the Canadian plains, you'll need to use a better vapor retarder than a coat of paint, especially if the building's interior is above 50% relative humidity. Also, don't forget that any vapor retarder only slows the diffusion of vapor — the transfer of moisture through tiny pores in the wall and ceiling materials. You still need a good air barrier to prevent air from leaking through cracks in the building, carrying moisture into wall and ceiling cavities.

J.D. Ned Nisson is president of Energy Design Associates, a New York City-based consulting firm, and editor of Energy Design Update, a monthly newsletter on energy-efficient building design and construction.

Simple CAD

Q. What simple CAD program can you recommend for generating low-tech working drawings?

A. *Craig Savage responds:* Your question is a good one because it is important to correctly define what you want to do with the CAD software before choosing the package. By my definition, "low-tech" means simple 2-D drafting, not 3-D perspectives, not color rendering, and certainly not generation of materials lists and project schedules. Of course, you can get these things in many CAD programs, but there is a cost — and it's not just in money. It's the time and effort needed to master a complex program.

Having said that, both Macintosh and IBM-compatible machines running Windows or OS/2 have a large assortment of 2-D CAD programs that are easy to learn and use. I started on the Mac, so I am partial to *MacDraft* by Innovative Data Design (about \$400). It's now available for Windows machines, as well, and is very capable of turning out everything from shop drawings to floor plans. *Claris Draw* (\$250 to \$400, depending on where you buy) is a

Simple CAD Sources

Adobe Systems
P.O. Box 6458
Salinas, CA 93912
800/642-3623

AutoDesk
111 McInnis Parkway
San Rafael, CA 94903
800/228-3601

Claris Corp.
5201 Patrick Henry Drive
Santa Clara, CA 95052
800/325-2747 or 408/987-7000

Innovative Data Design
1820-L Arnold Industrial Way
Concord, CA 94520
510/680-6818

fine Mac CAD product with a Windows version on the way. Aldus Corp (now Adobe Systems) make *IntelliDraw* (about \$100 when ordered direct from Adobe Systems). It truly is an intelligent drawing and graphics package, requiring a short learning curve. Finally, *AutoSketch* from AutoDesk (from \$130 to \$300) is another fine, simple-to-use drafting package. Mastering it will help you to prepare for the big (time-consuming) leap into *AutoCAD* (about \$3,800), should you decide that low-tech drawings aren't enough.

One last word of caution before you embark on computer drawing programs (or any program for that matter): Don't get sucked into buying more "power" than you need. It's much better to be able to use 80% of a program that delivers 90% of what you need, than to be able to use only 20% of a program that's capable of delivering 100% of what you need (but can't understand). ■

Craig Savage is a builder in Carpinteria, Calif., and publisher of Macintosh Construction Forum and Window on Construction newsletters.

Got a question about a building or renovation project? Send it to On the House, JLC, RR 2, Box 146, Richmond, VT 05477.