draftproofing against energy loss

h.e.l.p. sheet

overview

Draftproofing or air leakage control is an important step to help manage energy loss. In addition to saving money on energy costs, controlling air leaks can increase comfort in your living space by reducing cold drafts, dust, noise and moisture from the outdoors.

Background

Draftproofing, along with mechanical ventilation systems, allows you to exchange the air in your home in a controlled manner, ensuring energy efficiency, comfort and healthy air quality. However, it is important not to over-draftproof your home, as some air leakage or air exchange is necessary to maintain a safe and healthy home.

All of the small cracks and holes combined in a home can amount to the equivalent energy loss of leaving a door open year round. Many air leakage areas are obvious; however, the following checklist will assist you in a more thorough search. Areas of the home that deserve special draftproofing attention include:

- windows, doors and electrical outlets
- exhaust fans, vents, light fixtures and fireplaces
- corners where two outside walls meet or where the walls meet the ceiling and floor
- doors and hatches into unheated spaces
- behind bathtubs and under sinks mounted on exterior walls or over unheated spaces
- around plumbing pipes and ductwork entering the home from unheated spaces
- floor drains

Cold, windy days are the best time to check for air leaks. A good method for finding leaks is to use incense sticks to create smoke, which is susceptible to air movement. Large leaks will cause the smoke to dissipate and the tip of the incense to glow while slower leaks will cause the smoke to trail away or move toward the leak. Hold two or three sticks together for easier draft detection.

A more intensive method of finding air leaks is called the fan door test or depressurizing fan test which professional air-sealing companies use. In this test, a powerful fan is inserted in a doorway, and all intentional openings—windows, doors, chimneys and vents—are closed or temporarily sealed. The fan depressurizes the house and leaks are identified where air rushes into the home. A professional fan test can also determine the total leakage area in the home, the extent of the work required, the effectiveness of the work as indicated in a post-retrofit test and indications of backdrafting and dangerous gas spillage problems.

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EnerGuide for houses

The EnerGuide for Houses evaluation focuses on how a house can be improved in order to reduce energy costs and increase comfort. EnerGuide for Houses advisors make their assessments by using energy analysis software to model a home's energy systems, evaluate its energy performance and calculate an EnerGuide for Houses rating. The evaluation includes a blower door test and comprehensive walk-through tour of your house. A written report with detailed energy efficiency recommendations is also provided.
Call 1 800 387-2000 for details and prices.

Warning for combustion safety

Furnaces, fireplaces, wood stoves and any other fuel-burning appliances require air for combustion and for diluting and exhausting the products of combustion out of the home. If there is not enough air, it is possible that the chimney or flue could backdraft or spill dangerous gases into the home. Do not seal or fill over any exhaust or air intake vents, as all homes require some airflow. Sealing all air leaks and venting can result in a lack of air exchange, structural damage and long term health problems.

To ensure that your home has adequate air intake and venting to prevent these problems, some work to your home may need to be done. Most work for combustion safety, can be done by the do-it-yourselfer with a few special tools and the right materials. But if you prefer not to do the work yourself, a qualified contractor with specialized equipment and experience may be the best choice. Regardless of who completes the retrofit work, it is important that the work follows all safety and health regulations and recommendations for long-term savings and comfort.

Draftproofing products

There are a variety of products available to seal air leaks in the home and each product class has an application to which it is best suited. Check with the retailer to ensure the draftproofing products you want to purchase are approved or recommended for your job.

Sealants

Some sealants are better suited to smaller applications such as sealing around windows or doors or to seal joints between building components. Make sure the sealant you are using is compatible with the surface you are applying it to.

Acoustical sealant will bond to most surfaces and is excellent for sealing the joints in polyethylene air and vapor barriers but should only be used where it is sandwiched between two materials.

Acrylic latex is a water-based emulsion sealant, which works well on non-porous surfaces. This material should be limited to uses where the maximum joint width is 9mm (3/8 inch) or less.

Butyl rubber is a synthetic rubber sealant, which will bond to most surfaces and is appropriate for joint width up to 12mm (1/2 inch). This product is durable up to 10 years.

Silicone sealant is a solvent-free silicone compound, which produces a flexible watertight seal upon curing. Silicone is adhesive on most surfaces but may require primer on wood, steel or anodized aluminum. This material is excellent for large moving joints, up to 25mm (1 inch) and is highly durable up to 20 years.

Polysulfide sealant is flexible upon curing and is ideally suited for use on stone, masonry and concrete surfaces when used with a primer. Best when used at a maximum joint width of 25mm (1 inch). Polysulfide has a life expectancy of approximately 25 years.

Urethane foam sealant is available in a dispensing system with spray nozzles or individual aerosol spray cans with different rates of expansion depending on the ingredients. Check the cans carefully for details on the size of cracks that can be filled. This material should not be used on window headers since it can transfer structural loads if walls settle. It has life expectancy between 10 and 20 years.

Gaskets

Specialty gaskets have been developed for sealing joints where caulking may not be appropriate.

Sill plate gaskets are polyethylene foam strips that can be installed between the foundation and sill plated during construction or where existing house walls meet a new addition.

Electrical outlet and lighting fixture gaskets are designed to fit behind cover plates of electrical receptacles, switches and lighting mounts.

Neoprene gaskets are flexible and very durable. They can be used for sealing joints and penetrations where movement is expected, such as on plumbing stacks.

Weather-stripping

Weather-stripping is used to block air leakage around doors and the operable parts of windows. It comes in a variety of shapes; flat, tube or V shaped, and is designed to work under compression. Weather-stripping is effective when it closes the gap and doesn't allow air to pass.

Look for products that are flexible and spring-back to their original shape quickly. Avoid products that make it difficult to operate the window or door. Various weather-stripping materials include compression strips, tension strips, combination types, door bottoms, sweeps and thresholds.

Compression Strips

Compression strips should be used where there is a pressure stress, such as at the bottom of vertical sliding windows, along attic hatches or on hinged windows and doors.

Types of compression strips include:

Closed cell foam

- An adhesive-backed foam stripping available in rolls, making it an easy product to install.

Ribbed closed cell rubber

- An adhesive-backed stripping available in rolls. It's very durable and easy to install. It's good for irregular surfaces, but has difficulty accommodating long or varied gap widths.

Tubular stripping

- Made either with its own adhesive backing or an attachment strip of a different material. The rubber type is better than the plastic type for durability. This product is generally used as a window or door weather-strip and is often installed with nails, staples or screws depending on the type of attachment strip used.

Tension strips

Types of tension strips include:

Spring vinyl

- Can be used in the same applications as compression strips including in-sliding joints, such as double hung windows and doors. This material is adhesive-backed and has a good durability rating.

Spring metal

- Most often used as a door weather-strip and is most effective under light compression.

Combination types

These types include:

Spring-loaded/Self-adjusting weather-stripping

- These use a spring mechanism that allows it to adapt to unequal distances from the weather-strip to the door or window.

Magnetic strip systems

- These systems mount on the door/window frame and a metal strip mounted on the door or window provides the seal when the two are in contact. This system is effective for doors and hinged windows in moderate climatic conditions, but doesn't provide a good seal in cold temperatures due to frost formation.

Door bottoms, sweeps and thresholds

The bottoms of doors can be sealed using a number of systems and include:

Door sweeps

- Use a door sweep where your carpet has a low pile or is absent altogether. They are screwed on by attaching the strip to the bottom of the door.

Partial threshold

- Found in either vinyl or rubber strips, these provide an excellent seal and are attached to the door threshold.

Full threshold

- This is a combination strip that is also attached to the threshold. It requires at least 16 mm clearance below the door to be effective.

Door bottoms

- This is a combination strip of either a vinyl pile or compressible rubber. This strip is attached over the door bottom and requires 13 mm under the door.

Installation

This is a general guide only. Please ensure that all installations meet your requirements, manufacturer's instructions and all applicable codes, standards and regulations. BC Hydro is not responsible for installations.

ask us for more help:

This h.e.l.p. sheet provides advice for BC Hydro customers.

Phone
Lower Mainland 604 431-9463
Elsewhere in B.C. 1 877 431-9463

www.bchydro.com

72191 February 2005