

Agricultural Engineering

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Prepared for distribution by

Jerome R. Smith

Extension Housing Specialist

### ENERGY CONSERVATION IN THE RURAL HOME

## SAVE HEATING AND COOLING DOLLARS WITH WEATHERSTRIPPING AND CAULKING

The time and money you invest in weatherstripping and caulking windows and doors can pay off faster than almost any other home improvement you can make, even when your house is already well insulated. From 15 to 60 percent of the heating or cooling your house needs is due to air exchange. Warming the air that leaks into the house in winter, or conversely cooling the air that leaks into it in summer, takes energy and costs you money. Besides keeping out moisture, wind, and hot or cold air, weatherstripping will block entry to dust and noise, resulting in a cleaner, quieter home. Both weatherstripping and caulking are easy, economical, do-it-yourself jobs.

### WEATHERSTRIPPING DOORS AND WINDOWS

Weatherstripping may be purchased by the foot or in handy kits complete with the seal and fasteners for a single door or window. Installation instructions and diagrams are provided on most weatherstripping packages. Some weather seals are surface mounted and are visible, while others are concealed when the door or window is closed. They may be made of a variety of materials.

**Self-Adhesive Foam Tapes**—High-grade resilient sponge rubber or vinyl with paper backing in thicknesses up to three-eighths of an inch and widths up to three-quarters of an inch. Backing is peeled off as tape is pressed in place on door and window jambs, stops, or sash. Surfaces must be clean and dry; should be

applied at room temperature for best adhesion. Low cost; easy to install; foams tend to deteriorate when exposed to weather; may last only one season.

**Felt Weatherstrip**—Low-cost material in various widths and thicknesses. Fasten to wood by tacking or stapling and to metal with a good adhesive. Must be applied to door stop, sill, or sash so it fits snugly against other member. Easy to apply; tears easily during use; not as effective when wet.

**Aluminum and Felt Strip**—Aluminum strip crimped to thin felt strip provides added strength for tacking and holding to door jambs and window stops. Can be used for round-top doors. Felt may tear during normal use, especially on doors; felt not as effective when wet.

**Vinyl Weatherstrip**—General-purpose moisture and temperature resistant strip easily applied to wood or metal with tacks, staples, screws, or a good commercial adhesive. Tube-shaped for a tight fit, with extended strip for stapling or bonding to door and window jambs, stops, or sash. Easy to apply; durable.

**Sponge Rubber Neoprene-Coated Strip**—Round, high-quality durable sponge rubber with a spring steel reinforced strip for attachment. Provides exceptional holding strength when tacked or stapled. For bottom of door, fasten to door; for sides, fasten to door jamb. Also used on windows by fastening to appropriate frame, stop, and sash. Easy to install.

**Bronze Weatherstrip**—Thin bronze strip in various widths with one side flared out. Tacked to door jamb so when door is closed strip presses against the flared side making a tight fit. Also used for casement windows; not suitable for double-hung windows except at top and bottom. Low cost; easy to install; durable; not affected by moisture or temperature.

**Door Bottom Strip**—Brass-plated steel crimped to felt or vinyl strip. Fasten to lower edge of door with screws or small nails. Easy to apply; vinyl more durable; felt tears easily and is not as effective when wet.

**Weatherstrip and Caulking Cord**—Five or six caulking cords in a strip for sealing cracks in windows, doors,

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and around room air conditioners. Applied by pressing in place. Cord stays pliable and adheres to any surface. Low cost; easy to apply; durable, not affected by moisture.

**Waterproof Weatherstrip Tape**— Self-sealing, transparent, durable polytape for sealing cracks in any location. Easy to use by pressing to a clean, dry surface. For windows, tape applied half on stop and half on sash.

**Sponge Rubber Door Bottom Seal**— Mainly for garage doors, a blend of high-quality sponge rubber that stays flexible at extremely low temperatures. Applied to bottom of door with wide lip outside; if garage floor is lower than driveway, wide lip applied inside.

**Air Conditioner Weatherstrip**— Rectangular polyfoam that press-fits between the top frame or lower sash and upper pane to seal off the air spaces between window and air conditioners. Low cost; easy to install.

**Fiber Glass Insulation Strip**— Insulation strip in various sizes used with waterproof tape for closing large cracks around basement and garage doors, windows, and other cold air leaks. Also wrapped around hot water pipes for insulation.

**Door Bottoms**— Door bottom weatherstripping is available in several materials. While easy to apply, these products can interfere with door swing and require a reasonably level threshold beneath the door. Only simple handtools are required to install any of these door bottoms. After cutting to size with a hacksaw or tin snips, the door bottom is surface mounted to the inside of the door using wood screws normally provided by the manufacturer.

A fairly new innovation in weatherstripping is the mechanically operated "automatic" door bottom. In this model a vinyl seal is automatically lowered against the floor when the door is shut. The seal retracts when the door is opened.

**Thresholds**— A more attractive method of windproofing the bottom of a door is with a threshold. While most

thresholds are effective at cutting down wind infiltration, the average homeowner may find them difficult to install.

A popular threshold is an aluminum model with a flexible vinyl "bulb." When new, this threshold is effective; but under constant use the bulb soon collapses, leaving a sizable crack beneath the door. In most cases the vinyl is replaceable.

Though not the easiest type to install, the combination vinyl door bottom and aluminum threshold is long-wearing and provides effective weatherproofing. Since the vinyl is mounted in an aluminum extrusion fastened to the door, the aluminum threshold bears the brunt of wear.

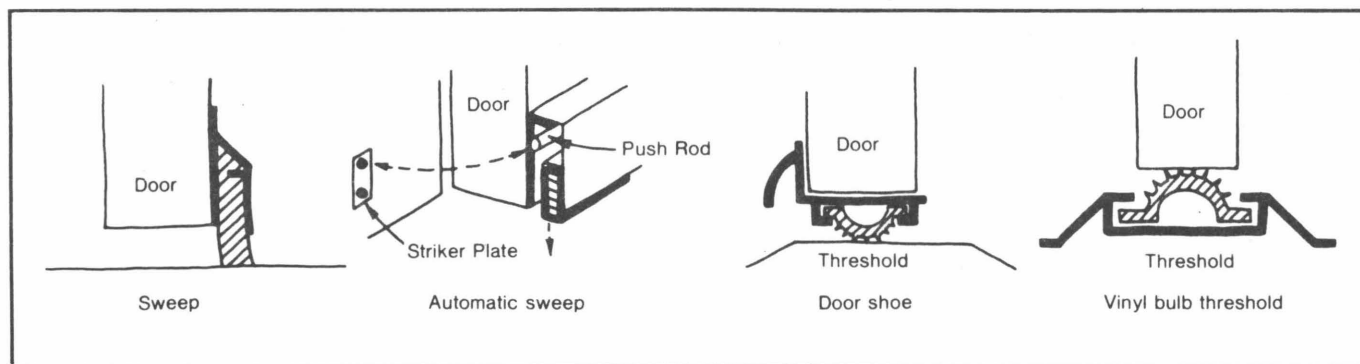
## CAULKING

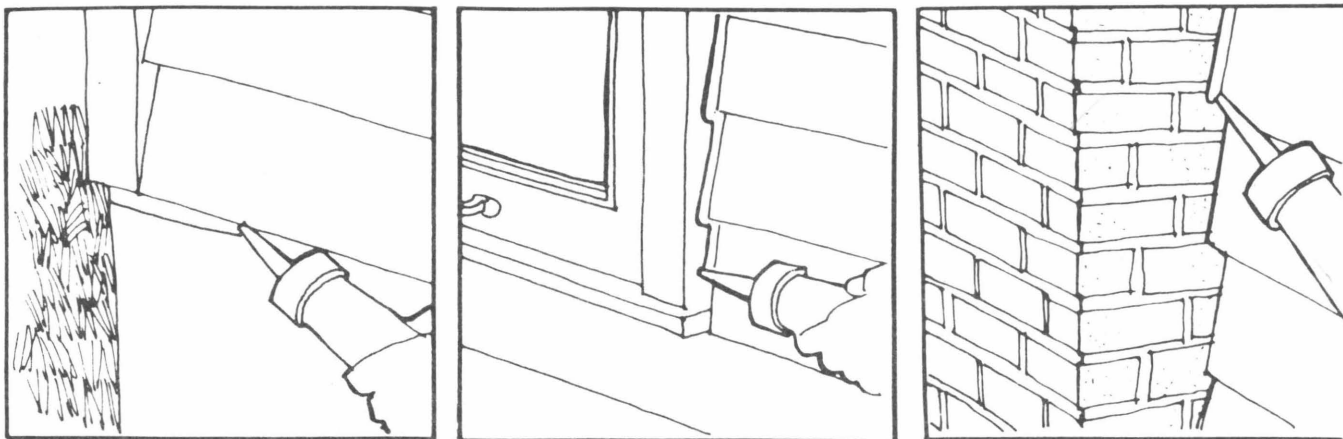
Do-it-yourselfers will find many caulking compounds in a wide range of prices. Most materials are packed in cartridges and can be applied easily with a caulking gun. For large jobs, 5-gallon containers of caulking for guns are used. Manufacturers usually print on each cartridge a description of the material, its performance quality, and directions for application.

Caulking materials that adhere to wood, glass, metal, plastic, and masonry should be selected since these materials expand and contract. Resistance to weathering, cracking, shrinkage, water, and mildew are also important. Some manufacturers will state the life expectancy of their product if properly installed inside or outside the home.

High-quality caulking compounds with a long life expectancy are generally the most expensive. Assuming that the caulking material is used outside as directed by the manufacturer, the following years of useful life may be expected: Silicone—30; polysulfides, polyurethanes, neoprene, acrylic (solvent release), vulcanized butyl rubber—20; acrylic-latex, butyl rubber, and synthetic caulking compounds—8 to 10; cheaper caulking compounds—3 to 5. This is only a partial list and is not meant to exclude any product.

Caulking should not be applied at temperatures below 40° F. It should be installed when temperatures range





between 45° F and 55° F. At these temperatures expansion and contraction at joints are at a midway point.

Surfaces to be caulked should be clean, dry, and grease-free. Remove dust, loose particles, and old caulking. A steel brush is a good tool for cleaning joints. Refer to the manufacturers' recommendations for caulking large cracks.

**Sealing Cracks and Seams**—Sealing exterior cracks and seams is an important part of home maintenance. It reduces entry of air, dirt, and moisture into the house and contributes to lower heating and cooling costs.

Among the most important exterior areas of a house requiring attention are:

- Chimney flashing
- Joints between chimney and siding
- Joints between eaves and gable molding
- Joints between window sill and siding
- Joints between window sash and siding
- Joints between window drip cap and siding
- Joints between windows and masonry
- Door frames
- Joints between masonry or concrete parts (steps, porches, etc.) and main part of house
- Inside corners formed by siding

## APPLYING SEALING MATERIALS

Follow these pointers for successful application of sealing materials:

- Remove old, dried sealing materials. Clean area with a solvent to remove grease or other substances that would prevent a tight bond.
- Deposit sealing material at the bottom of the seam so it fills without bubbling.

- Never apply sealing material to a porous surface.
- Prime before application.
- Never skimp. Use enough sealing material to fill the crack or seam.
- If sealing material shrinks during drying, reapply.

# **USES AND PROPERTIES OF COMMON SEALING MATERIALS**

Material	Recommended Uses	Cleanup Solvent	Shrinkage	Adhesion	Remarks
<b>Silicone</b> Household	Seals joints between bath and kitchen fixtures and tile; adhesive for tiles and metal fixtures; seals metal joints as in plumbing and gutters	Dry cloth will remove if area is cleaned up immediately. Use mineral spirits or naphtha	Little or none	Good to excellent	Readily available. Flexibility of cured silicone allows stretch of joints up to three times normal width or compression to one-half the width. Cost: High
<b>Silicone</b> Construction	Seals most dissimilar building materials (i.e., wood and stone; metal flashing and brick)	Same as above	Same as above	Same as above	Remains flexible for life after curing. Permits joints to stretch or compress. Silicones will stick to painted surfaces, but paint will not adhere to cured silicone. Cost: High
<b>Butyl Rubber</b>	Seals most dissimilar materials (glass, metal, plastic, wood, concrete). Seals around windows and flashing, or bonds loose shingles	Use mineral spirits or naphtha	From 5 to 30 percent	Good	Less resilient than silicones. Allows for joint movement but does not become brittle with age. Can be painted after skin forms. Apply when temperature is above 40° F. Cost: High
<b>Latex</b>	Seals joints around tub and shower; fills cracks in tile, plaster, glass, and plastic; fills nailholes	Use water	From 5 to 10 percent	Good to excellent	Easy to use. Seams can be trimmed or smoothed with moist finger or tool. Good water resistance when dry. Can be sanded and painted. Less elastic than above materials. Easy to clean up. Cost: Moderate
<b>Oil-Base Caulks</b>	Seals exterior seams and joints on building materials	Use mineral spirits or naphtha	From 10 to 20 percent	Good	Readily available. Least expensive of the four types. Rope and tube form. Oils dry out and cause material to harden and fall out. Cost: Low

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