



Siding

Today, you can do just about anything you want to the outside of your house. You can put wood siding on vertically, horizontally, or diagonally. You can choose shingles or shakes, bricks or stone, aluminum or vinyl, or combinations of sidings. If you are re-siding, you can go from painted siding to stained, from wood to brick, from stucco to steel.

Siding can do more for the exterior surface of your house than any other home improvement. It is an important part of how your home looks, how much maintenance it needs, and how it is valued for resale. Siding is also your home's defender against outside forces. It protects against wind, rain, and snow. It withstands abuse, such as a blow from a baseball or the constant rubbing of a branch.

Following are descriptions of some popular types of exterior home coverings or sidings available today. (Technically, brick, stone, and stucco are exterior coverings, not sidings. However, in this publication, the term "siding" will include all exterior coverings.) The most common sidings are wood-based, such as solid wood, plywood, shingles, shakes, hardboard, and particleboard. But a variety of other materials also are used for initial siding or re-siding. These include brick, stone, aluminum, steel, vinyl, and stucco.

Wood

Solid Wood or Lumber Siding

Solid wood or lumber siding has been around a long time and is still the most common siding. It is popular because it is attractive, durable, readily available, and easy to install on new houses. Residing with wood is difficult since all the old siding must be removed.

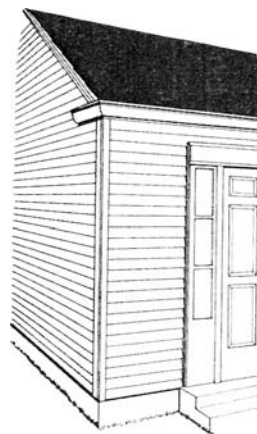
This siding can be installed vertically, horizontally, diagonally, or in any combination. Most lumber siding does not strengthen the structure, so corner bracing is necessary. However, the solid wood logs used in log house construction provide both structural strength and siding.

The biggest disadvantage of wood siding is that it needs periodic maintenance. Paint, the traditional finish for wood, may blister, peel, crack, fade, or chalk. Homeowners who have experienced these problems are especially critical of wood. This is unfortunate because properly installed paint or stain on a suitable wood siding won't fail, although it will occasionally need repainting or restaining.

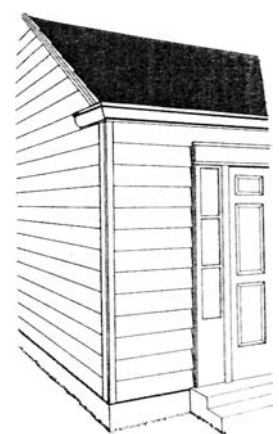
Most paint problems are caused by interior moisture that passes through the wall and lifts (blisters) the paint. These moisture problems must be corrected before any refinishing or re-siding. For help in dealing with moisture problems, see these extension publications: *Controlling Winter Moisture Problems in Houses* (PM 947), *Minimizing Moisture Problems in Wood-Frame Houses* (PM 882), *Finishing Exterior Wood Surfaces* (PM 362), and *Paint Problems on Exterior Wood* (PM 363).

Semitransparent, oil-based stains work on exterior wood siding. Most bevel sidings have one rough sawn side, which is ideally suited for staining. Unlike paints, stains do not blister, peel, crack, or chalk. A house with two coats of properly applied semitransparent stain and an additional coat applied 3 to 4 years later should not need further treatment for up to 10 years.

Narrow-lap bevel siding



Wide-lap bevel siding



Some woods, such as all-heartwood redwood or cedar, can be allowed to weather without any finish. Although no treatment is necessary, the use of a water-repellent or weather-repellent preservative helps protect the wood. Bleaching stains help speed the natural weathering process. Vertical-grain, all-heartwood redwood and cedar are two ideal woods as exterior siding, but they are expensive.

The soft pines also have favorable characteristics and are less expensive. But, because the soft pines do not weather as well as redwood or cedar, they must be protected from the weather with roof overhangs, water-repellent preservatives, and surface finishes. These woods should not be used where rotting is a potential problem, such as behind roof gutters.

Materials, installation, and finishing costs are higher for solid lumber siding than for some other sidings. However, maintenance costs are less because homeowners can do much of the maintenance themselves. Wood sidings that are unsuitable for exteriors, improperly installed, or improperly finished often fail in a few years. Some sidings are susceptible to splitting, warping, rot, or termites. Moisture aggravates these problems. For more information on wood siding, see the extension publication, *Wood-Base Exterior Sidings for Houses* (PM 959).

Plywood Siding

Plywood siding is popular for both new house construction and for re-siding. Plywood is less expensive to install than solid wood. It is readily available and easily installed by local labor. It comes in a variety of patterns and surface textures.

Imaginative installation of vertical and horizontal sheets, often in combination with other siding material, such as brick, can be very attractive. In addition, plywood adds considerable structural strength to the house and often can be installed in new houses without any sheathing material.

Most plywood siding requires an exterior finish although it is available with preprimed, presealed, or vinyl-clad finishes. Overlaid plywood (MDO) has a surface film especially suitable for painting and should be used if paint is to be the finish. Even though large amounts of MDO plywood are produced, it is often a special order item at local stores.

Rough surface plywood is ideally suited for staining, using either semitransparent or opaque stains. Plywood made of suitable woods, such as redwood or cedar, can be allowed to weather naturally. Follow the manufacturer's recommendations on finish. Prices for plywood vary from modest for yellow pine and fir to high for redwood and cedar plywood.

Shingles and Shakes

Shingles and shakes are popular siding materials. They are durable, add interesting textures to a house, and are available in several woods, lengths, and types. Installation requires skill but can usually be done by local labor. Shingles or shakes do not add structural strength to the house and require a good nailing base, so wood or plywood sheathing is needed. Some companies produce plywood sheets with shakes already applied. This greatly speeds installation. As with other wood products, shingles and shakes may be stained, painted, or allowed to weather naturally. Water-repellents, semitransparent stains, or natural weathering are the easiest finishes to maintain.

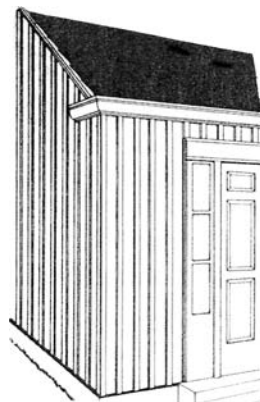
Material and installation costs of shingles and shakes are higher than for some other sidings. The most expensive shingles and shakes are constructed from more durable wood species, like western red cedar. Adding a finish to shingles and shakes is more expensive than using prefinished material. For more information on this kind of siding, see the extension publication, *Wood-Base Exterior Sidings for Houses* (PM 959).

Hardboard

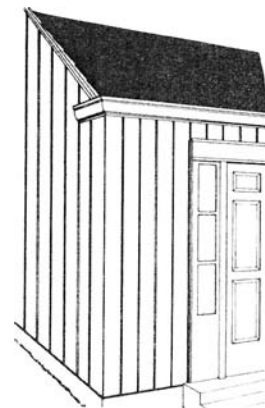
Hardboard has recently become a popular siding material. Hardboard for siding is made from interfelted wood fibers designed with a specific density. Thus it has a uniform composition and appearance. There are no grains, knots, or natural defects in hardboard. The material doesn't delaminate, split, splinter, or warp like ordinary boards.

Smooth and textured surfaces, either unfinished, primed, or prefinished, are available in both lap and vertical panel styles. Hardboard can be embossed and textured to look like wood or plywood. It can be installed over sheathing or directly to the wall framing. Lapped hardboard does not strengthen the structure, so corner bracing is necessary. The installation of the typical 12 inch wide by 16 foot long siding is quick and easy.

Board and batten vertical siding



Panel siding



Hardboard siding is inexpensive. The vinyl clad types cost more, but carry guarantees up to 30 years. Other types must be periodically refinished, repainted, or stained. Textured siding should be stained with an opaque (solid color) stain, not a semitransparent stain. The high maintenance costs for unfinished hardboard siding are partially offset by the lower initial cost.

Particleboard Siding

Particleboard, a relatively new material, is available as overlaid, particleboard siding or as waferboard. Overlaid particleboard siding consists of a particleboard core, overlaid on both sides with a resin-impregnated fiber sheet and has a smooth appearance.

Overlaid particleboard siding is not stocked in all lumber yards, but is usually available on order. Manufacturers generally recommend a paint finish for overlaid particleboard. Routine maintenance consists of painting when needed.

Waferboard is particleboard with large wood flakes left exposed. It does not paint or stain well and should not be used as exterior siding. However, waferboard with exterior glue works well for sheathing under siding. Its use as sheathing is increasing, since the large 4 x 8 foot sheets go up quickly and cost less than plywood.

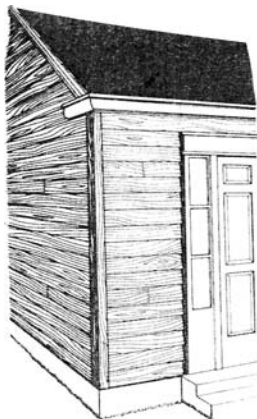
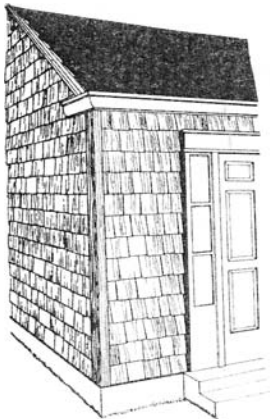
Metal

Aluminum

Aluminum is among the most popular siding materials, especially for re-siding. Produced by large firms, it is widely available, often through contractors who do the installation.

The siding is manufactured in numerous colors, sizes, and textures. Many aluminum sidings imitate the appearance of wood, including vertical, shingle, and shakes styles. The most popular materials look like smooth or textured wood siding.

Shake or shake look siding Wood or wood look siding



Although aluminum is light and easily nailed up, installation usually requires a specialist with the tools to cut and bend the material and the experience to install it correctly. Skilled installation is important because aluminum expands and contracts with temperature changes. Aluminum adds no structural strength to the house, so it must be installed over sheathing.

Because aluminum siding dents easily, the thicker 0.025-inch thickness is preferable to the 0.020-inch thickness. In addition, most companies offer a thin backer board of insulation that fits behind each panel. This protects against dents, reduces noise, and slightly increases the insulating value of the siding.

Aluminum siding conducts electricity and may interfere with television reception unless an outside antenna is used. Aluminum siding should be grounded.

Aluminum siding is available in different finishes. The vinyl-coated (plastic clad) finishes are more expensive, but last longer than the baked enamel paint finishes. The long-term finishes require little maintenance over long periods of time. Usually, they only need the dirt hosed off. Guarantees of up to 40 years are available for the long-term finishes. If scratched, the exposed aluminum will not rust. Scratches can be touched up with special material or paints.

The baked finishes are similar to car finishes and, over a period of time, will fade and weather. Repainting aluminum siding is similar to repainting a car, requiring careful preparation, proper paint, and correct application.

Aluminum is a nonrenewable resources, but it can be recycled. It is a moderate to high-priced siding. It used to be less expensive than vinyl and steel sidings, but is now often quite comparable to them in price.

Steel

In the past, steel siding was not particularly popular. This may have been due to its high cost and limited selection of colors and styles. However, now many colors and styles are available and prices are competitive. And, while costs of purchasing and installing steel siding are relatively high, maintenance costs are low.

The most popular steel patterns look like smooth or textured bevel wood siding. Others resemble cedar shingles or shakes. Some imitate board and batten siding.

Installation of steel siding requires special skills and tools and is best left to a contractor. Most steel siding contractors sell both the siding and the installation.

Steel resists dents. However, hard blows, such as a whack from a lawnmower, can dent the siding or chip the factory-applied finish. Prompt repairs are necessary to prevent rust.

Steel siding comes in several different finishes. The vinyl-coated (plastic clad) finishes are more expensive and last longer than the baked enamel paint finishes. Barring damage, these finishes should be relatively maintenance free for an extended period. All that is needed is an occasional hosing down.

The baked finishes are similar to car finishes and, over a period of time, will fade and weather. Repainting steel siding is similar to repainting a car. It requires careful preparation, the right paint, and correct application.

Steel siding can be noisy in driving storms and high winds. Backer boards both quiet and stiffen the siding. Steel conducts electricity and may interfere with television reception unless an outside antenna is used. Steel siding should be grounded.

Synthetic

Vinyl

A fairly new product, vinyl siding is gaining popularity. Vinyl will not fade or rust and resists dents. It is available in a wide range of styles and colors, many of them made to resemble wood. Vinyl siding also is fabricated to resemble other materials, such as brick and stone.

The siding can be cut with common tools and installed by local labor. People handy with tools can do it themselves. It is flexible, except in extremely cold weather when it becomes brittle. Blows that would dent other siding materials, such as moderately-sized hail, usually bounce off vinyl siding. Vinyl siding does not support combustion, but it will soften and distort under high temperatures.

This siding is quiet in hail, rain, and wind. It does not conduct electricity, so it does not need grounding.

Vinyl siding generally comes with lifetime guarantees. Maintenance is easy. The siding consists of the same vinyl material all the way through so scratches do not need to be retouched. Maintenance consists of an occasional rinse with a garden hose. Mild detergents can be used for stubborn dirt. This siding cannot be repainted.

Costs of vinyl siding vary widely. It may be more or less expensive to install than aluminum or steel.

Fiberglass-reinforced Plastic (Fiberglass)

Fiberglass siding can imitate brick, stone, and wood siding. This siding is sold in large panes that are nailed onto the house. Installation, although simple, requires skill in covering edges and planning patterns.

Maintenance of fiberglass siding is inexpensive. The panels are resistant to heat and impact and are able to withstand most blows without damage.

Fiberglass is often a special order item. Cost varies with pattern and quality, but it is usually a moderate to expensive siding.

Insulated Panels

Steel, aluminum, wood, or concrete panels with rigid insulation sandwiched in between have been used in commercial buildings for some time and are now making an appearance in new house construction. They are well-suited for post-and-beam construction. When used in post-and-beam construction, the panels form a complete wall system, with exterior surface, insulation, and interior surfaces.

The exterior and interior faces are available in many materials, colors, textures, and styles. Some panels are even designed as structural support members and can be used as complete outer walls without any additional framing.

Sidings come in a variety of materials, textures, and colors. The traditional appearances of wood siding, stucco, brick, and stone are now available both in real and imitation materials.



Two-story house with horizontal siding



Two-story house with mixed diagonal, horizontal, and vertical siding

These panels are not readily available. Design of the structure and the installation need to be done by a professional, and initial costs of the siding may appear high. However, the total cost, when compared to other construction methods, can be competitive. Maintenance is usually easy and inexpensive, depending on what surfaces are selected.

Specially Surfaced Panels

Traditionally, plywood, hardboard, fiberboard, and rigid insulation panels also have been used in commercial and industrial remodeling. However, these panels can be used on homes too.

These panels come in a variety of surfaces, textures, and colors. Some common surfaces are stucco, stone aggregate, thin brick, and imitation brick. The covered insulation panels are especially suited for insulating and covering the exterior of basement walls.

Availability of these panels depends on the area. Most panels must be specially ordered. Although they can be installed by local labor, a professional is often needed for satisfactory results.

Initial cost is high, but the panels are often less expensive to purchase and install than the unfaced material. (For instance, panels of face brick on polystyrene are less expensive than brick masonry.) Also, the insulation panels offer the advantage of providing insulation and covering in one product. Maintenance costs usually are low.

Masonry

Brick

Genuine clay brick has been used as a siding for centuries. Brick's durability is proven. It is attractive, with many types, textures, and colors available. Brick houses are also quiet inside. Brick does not burn, rot, support termites, suffer hail damage, or conduct electricity. It also does not need any exterior finish.

Brick is an excellent siding for both new and old homes because it can be laid in a variety of patterns and because it is visually compatible with many other building materials, such as wood.

Brick is structurally strong. The common practice is to lay full size brick in front of either a concrete, concrete block, or frame wall. The brick requires support from below, usually provided with a footing.

Metal ties are used to connect the brick to the frame wall, or the brick may be plastered to a concrete or block wall with cement mortar.

A modern building practice is to use block only as a facing material. One-inch thick brick that can be nailed to the home, or ¼ -inch thick brick that can be glued on, are available.

The air gap between conventional brick and the frame wall provides only a small amount of insulation. When brick is nailed or glued on, there is nearly no insulation at all. For all types of brick construction, sidewall insulation must be provided behind the brick.

Siding or re-siding with brick is expensive and requires a professional mason. Used brick is more expensive and less durable than new brick so, usually, new brick should be used.

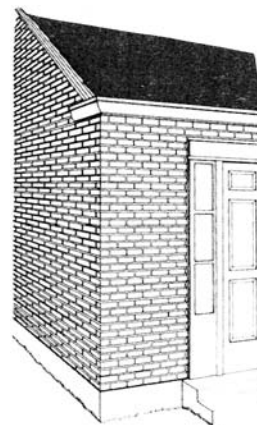
Brick siding requires little maintenance. It is important to maintain the grout and prevent moisture from entering the wall. With proper maintenance, brick lasts a lifetime.

Stone

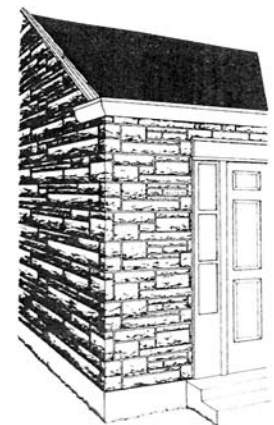
Stone, like brick, has been used for centuries as a house siding. It has many of the same advantages as brick, including durability. Stone is available in many sizes, colors, and patterns. Small round stones, large flat stones, and very large rubble stones can all be purchased. One-inch thick slabs of concrete with small stones embedded have also been produced.

Shipping costs usually restrict the use of stone siding for home construction to what is available in a particular area. Professionals should lay the stones. The initial costs are low. It is important to maintain the grout and prevent moisture from entering the wall.

Brick or brick look



Stone or stone look



Manufactured Stone

Manufactured stone is a combination of cement, light-weight aggregates, and colored oxide. High quality manufactured stone, correctly installed, and architecturally in character with the house, is difficult to distinguish from real stone. Yet, it costs less and weighs less.

Manufactured stone may not be available locally. Professionals should lay the stone and installation costs are high. Maintenance is inexpensive. It is important to maintain the grout and prevent moisture from entering the wall.

Stucco

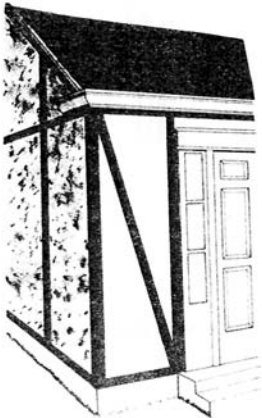
Stucco siding is less popular today than in the past for several reasons. A skilled laborer must install and repair it. Installation consists of three coats, applied over several days. And stucco cracks if the house settles. These cracks allow water to penetrate the walls. This can result in serious problems if no repairs are made.

Stucco can be installed directly over masonry walls. But, if stucco is to be installed over frame walls, it requires building paper and metal lath.

Stucco is the only finish that can be installed in an unbroken sheet over an entire wall. The finish coat can be textured or smooth and even colored by the mason. Pebbles can be pressed into the wet surface for a pebbled effect.

Installing stucco is expensive. Stucco does not need painting. Routine maintenance is easy and consists mainly of repairing small cracks. But if the stucco develops large cracks that allow water penetration, repairs are expensive and must be done quickly before more damage occurs.

Stucco or stucco look



Moisture and Siding

When siding or re-siding, the homeowner should try to head off any moisture problems in the home. Moisture is one of the biggest threats to exterior walls. In the winter, the flow of water vapor (a gas) is from inside the house to outside. This water vapor presses against exterior finishes and lifts them off. If the vapor is trapped in the wall cavity, it will condense and perhaps even freeze. This soaks the insulation, stains the walls, and can cause the wood to rot. The freezing also opens mortar joints in the masonry wall, causing damage.

Water can also leak into the wall from the outside through poorly-caulked joints, loose masonry joints, loose flashing, and other holes in the wall.

Moisture problems in exterior walls can be reduced by:

- Providing a continuous vapor retarder near the warm side of the exterior wall. This slows the flow of moisture vapor, reducing the amount of moisture trapped in the wall.
- Ensuring the home is leak-proof with a good roof, good walls, and good exterior flashing and caulking.

In new construction, it is easy to ensure that the correct moisture controls are built into the house. In older homes moisture control can be difficult. Before re-siding an older house, fix all leaks, and install a vapor retarder on the **warm** side of the exterior wall. Vapor retarder paints, vinyl wallpaper, or polyethylene (plastic) can be installed on the inside of the walls as vapor retarders.

Exterior siding should not trap moisture inside the wall. So a vapor barrier should **not** be used on the **outside** of the wall. Any siding material used should allow trapped moisture vapor to escape.

Insulation Value of Siding

Siding has many attractive qualities, but it simply is not a good insulator. The Federal Trade Commission (FTC) reports that no type of siding can insulate a home or lower fuel bills. Even siding sold with thin panels called “backer board” or “drop-in panels” will provide only a very small energy-saving benefit. The FTC warns consumers not to confuse these siding products with true insulation products, such as fiberglass, cellulose, and rigid plastic sheet siding.

Also, do not be misled by comparisons of energy savings between an “uninsulated” wall and a wall with siding added. Instead, compare the R-value, which measures the insulation’s ability to resist the flow of heat. The higher the R-value, the better the insulator.

Most houses constructed before 1950 had no wall insulation. For these older uninsulated houses the insulating qualities of various sidings were important and affected both comfort and heating bills. Today's wall insulation (fiberglass, cellulose, rigid plastic sheets) is so much better at insulating that the insulation value of the siding is minor in comparison.

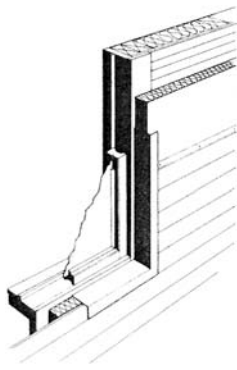
If possible, existing wall assemblies should be insulated to at least R-20, with R-30 a reasonable goal. Superinsulated houses may have even higher insulation levels.

In new construction, walls 6 to 12 inches thick are often used to allow room for adequate insulation. Another insulating method, suitable for both new construction and re-siding, is to install siding over large sheets of plastic insulation made of polystyrene, polyurethane, or polyisocyanurate. Although this adds to the cost of siding, the plastic insulation will noticeably increase the insulating qualities of the wall.

A thin (i.e. 3/8 inch) solid sheet of rigid plastic insulation should not be used on older houses that do not have a continuous interior vapor retarder. The insulation could trap moisture in the wall behind the insulation, wetting the wall insulation, and eventually rotting the wood.

This moisture problem is reduced if thick solid sheets of rigid plastic insulation (1 to 3 inches) are used instead of thin sheets. The thicker insulation keeps the wall warm and prevents condensation and freezing inside the wall. The Canadian practice is to add exterior rigid insulation with an R-value two times as high as the insulation in the wall cavity.

There have been problems with structural support of siding applied over thick sheets of rigid insulation. Adequate fasteners must be used. Some wood sidings installed over rigid insulation have cracked or split. Check with siding suppliers for specific recommendations for their product.



Additional insulation added under siding

Appearance

With the large variety of sidings available, the outside appearance of a home becomes a matter of taste and personal preference. Siding gives a distinct personality to a home. Just as carefully designed and well maintained siding enhances the appearance and value of the home, mismatched and neglected siding detracts.

Details are important when siding. Small mismatches that do not appear noticeable from the ladder often are obvious from the ground. The siding should be level and horizontal lines straight. If the entire house is out of plumb, the siding should be lined up with the windows.

Vertical line siding makes a house look taller and thinner while horizontal line siding lowers and widens the house. A mixture of sidings can emphasize portions of the house, but proceed with caution when mixing siding types. A restyled house where different siding styles are used and not unified into the overall design can appear disjointed.

The "character" of the home should be considered. A turn-of-the-century home looks best with narrow clapboard siding of that era. New, wide siding, or fake stone doesn't fit with Victorian Gingerbread.

Avoid using too many textures together. Usually one or two different textures, like wood, or wood and brick, are preferable to three or more textures. For example, do not mix wood, stone, brick, and plywood on the same house.

Choose the color carefully. With long-life finishes, you will be looking at the color for the next 40 years or more. Trendy, fad colors usually are not a wise investment when selecting long-life siding.

Traditional white remains the favorite. A white house stands out from the background, but does not clash. Earth tones blend the house with the surroundings. Natural wood and pastels remain strong favorites. Homeowners should avoid bright colors, like bright red, blue, or green, unless they definitely prefer those colors. And even then, it is a good idea to select bright colors only on materials that can be repainted.

You can use a photograph and tracing paper to observe the effect different siding styles will have on your home. Photograph your home, then trace the outline of the house and draw in the new siding. Also, look over siding company publications. Most companies have brochures with photos of their sidings. Some have books showing how houses look with various types of siding.

Do not rush into a siding job. Before you re-side, take the time to insulate, replace, or move doors and windows, and make other changes to the house exterior. For older

houses, the sheathing can be removed and insulation installed between the existing studs before re-siding.

If you are in doubt, consider consulting a qualified designer or architect who can help you with questions on design, color, texture, and suitability of material.

Which Siding to Install?

There is a wide choice of siding materials with an equally wide choice of colors, textures, styles, patterns, and installation techniques. As a result, there is no one best siding material.

If low initial cost is important, an inexpensive siding like preprimed hardboard could be used. For long-term durability, brick or stone would be good. If you want to install and maintain the siding yourself, a painted or stained wood or plywood siding might be appropriate.

For special applications or effects, fiberglass reinforced plastic, insulated panels, or specially surfaced panels can be used. Aluminum, steel, and vinyl are low maintenance sidings that can be quickly installed by professionals on new or existing houses.

With so many options, selection of siding becomes a decision that combines personal preference with affordability. Local suppliers, contractors, extension workers, designers, and architects can help you make the decision, but in the end the choice is yours.

As you decide on siding, consider the following:

- Appearance
- Style
- Color
- Type of finish
- Purchase price
- Installation
- Maintenance
- Durability
- Fire resistance
- Availability
- Adding insulation
- Noise transmission
- Strength
- Dimensional stability

Siding Materials

	Number of different surfaces	Durability	Suitability for homeowner installation	Advisability for staining	Advisability for painting	Maintenance cost	Installed cost
Wood							
Solid wood—siding	H	M	H	H	M	M	M
Plywood—siding	H	M	H	H	M	M	L
Shingles and shakes	M	M	M	H	M	M	H
Hardboard siding	M	L	H	L	H	M	L
Overlaid particleboard siding	M	L	H	L	H	H	L
Metal							
Aluminum siding	M	M	L	NA	M	L	M
Steel siding	M	M	L	NA	M	L	M
Synthetic							
Vinyl siding	M	M	M	NA	L	L	M
Fiberglass-reinforced plastic	H	*	L	NA	L	L	M
Manufactured stone	M	*	L	NA	L	L	M
Insulated panels	H	*	*	*	*	*	*
Specially surfaced panels	H	*	*	*	*	*	
Masonry							
Brick	H	H	L	NA	L	L	H
Stone	H	H	L	NA	L	L	H
Stucco	L	M	L	NA	M	L	H

* = Depends on supplier, surface selected, or other factor. NA = Not applicable
L = Low M = Medium H = High

File Code: Human Housing 5

... and justice for all

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