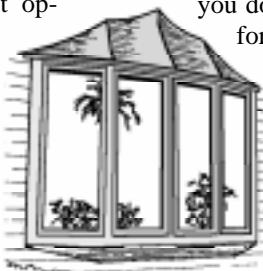




Jim Dulley

Thank you for your interest in writing to me about bow and bay windows and other lower-cost options to increase the openness and natural lighting in a room. Although there are many variations, diagrams of the basic designs are shown on this page. My particular preference is for a 45-degree angle bay with casements on



Casement Bow



Angle Bay

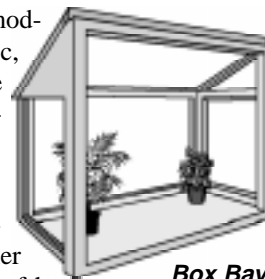
each side and a fixed picture window in the center.

There are literally hundreds of window manufacturers and many small lo-

cal companies, that make bow and bay windows. I have reviewed and listed only manufacturers of the most efficient, highest quality windows with the best warranties. Even if you do not plan to stay in your home forever, a long-term transferable warranty is still important. You should be satisfied with the quality of any of the window manufacturers I have listed.

If you want the lowest maintenance windows, along with high efficiency, then a vinyl frame is an excellent choice. Great Lakes Windows and Thermal Industries offer foam insulation filled frames for efficiency in severe climates. Traco, makes a unique strong window with an exterior aluminum frame attached to a vinyl interior frame.

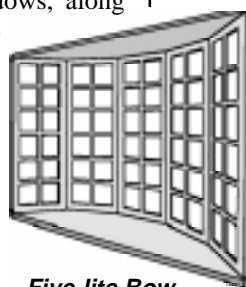
Their Trawood models have realistic, no-maintenance wood grained interior surfaces.



Box Bay

Marvin, Thermal Industries and Weather Shield offer some of the highest efficiency triple-pane glass with two low-e coatings and two inert gas-filled gaps.

Double-pane glass with one low-e coating and argon gas in the gap is the minimum you should consider. If you want a colonial grille pattern, I recommend removable grilles. These are much more efficient than true divided lites and make it easier to keep the windows clean.

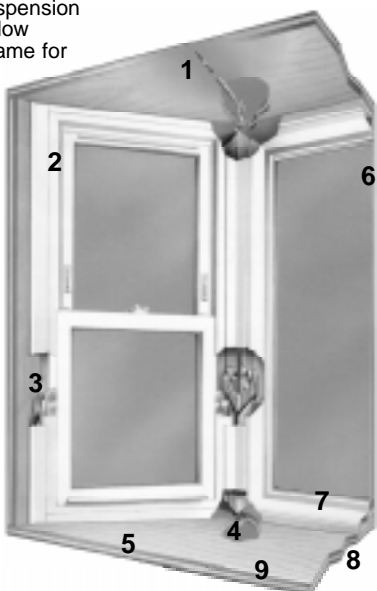


Five-lite Bow

Jim

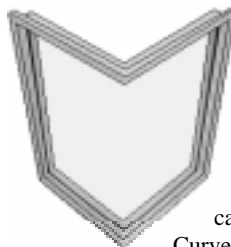
Bow and Bay Window Features by Certainteed

- 1) Cable or chain suspension system secures window structure to house frame for strength and stability
- 2) Fusion-welded frames and sashes for structural strength
- 3) Aluminum reinforcements in mullions and jamb returns create a strong, stable unit
- 4) Steel rods tie head and seatboards for optimum strength
- 5) Head and seatboards have a foam core for added insulation and a vinyl exterior surface for weather resistance



- 6) Double-pane glass units with low-conductance spacers deliver thermal efficiency with Thermalflex Low-E glass and argon gas.
- 7) Interior covers for jamb returns, mullions and head and seatboards have no exposed joints, hardware, or sealants
- 8) Exterior covers for head and seatboards, jamb returns and mullions provide weather-tight finished edges
- 9) Birch head and seatboards can be stained or painted to match any decor

Corner and Curved Windows by Marvin Windows



Marvin's corner window is available in seven standard sizes. These sizes correspond to Marvin's Casemaster sizes for a wide range of design possibilities. 1" insulating glass is standard for energy efficiency with single glazing as an option. The corner windows also have removable wood bead glazing stops so the glass can be replaced.

Curved glass single-hungs feature a coil spring block-and-tackle balance system that makes for easy sash operation. The bottom sash tilts inside the room. The glass is held in place by removable wood bead stops. Curved glass is available in nine standard sizes. There are also curved glass picture windows available in 10 standard sizes to complement the curved glass single-hung. Jamb extensions, assemblies, brick mould casings, or various flat casing widths are available. Incorporate curved or corner windows into radiused walls, towers or use as an alternative to a conventional bow or bay window.



Selected Manufacturers of Bow and Bay Windows

ANDERSEN WINDOWS, INC., 100 Fourth Ave. No., Bayport, MN 55003 - (888) 888-7020 www.andersencorp.com

styles - casement, double-hung and angle or box bay (30°, 45°, 90°)

frame - *solid wood covered with PermaShield cladding system

colors - white • sandtone • Terratone • forest green

warranty - 20-year for glass, 10-year all other parts, even if the owner sells the home

glass options - "High-Performance" or "High-Performance Sun" (soft gray tint) solar control insulating glass has a microscopically thin metallic coating bonded to an inner surface of the sealed pane of glass, argon gas is sealed inside the two panes of glass • High-Performance tempered insulating glass is available for walk out bay window installation. "High-Performance" is for all season climates while the "High-Performance Sun" is for tropical or dry climates.

special decorative glass options - Art Glass collection — available in 11 stained glass designs and more than 30,000 shape, size and color combinations. The panels are trimmed in maple and have zinc coming (leading). The panels fasten to the inside of the windows and have a special fastening system that provides easy mounting into new or existing Andersen windows. The snap-lock fasteners allow the panels to be removed for cleaning or window maintenance.

features - Standard head and seatboards are offered in a clear pine- or oak-veneer. A cable support system provides additional support. A limited ventilation control adaptor is an optional accessory to restrict casement sash movement. Also available is a corrosion-resistant hinge and operator arm hardware kit made with 300 series stainless steel. This option is ideal for harsh and corrosive environment applications such as heavy industrial or coastal areas.

CARADCO, 201 Evans Rd., Rantoul, IL 61866 - (800) 626-3105 www.caradco.comstyles - casement, double-hung and angle bay (30°, 45°)frame - solid wood • aluminum-clad

vanilla • Hartford green • sandstone

colors - brilliant white • chestnut bronze • mesa red • Frenchwarranty - 20-year against stress cracks and glass seal failures, 3-year limited covering materials and workmanshipglass options - argon-filled LoE2 glass — coated with microscopically thin layers of silver sandwiched between layers of anti-reflective metal oxide coatings. A protective coating layer is then applied to ensure durability and scratch-resistance • clear • bronze or gray tint, • obscure • temperedspecial decorative glass options - There are five heights and three decorative glass transom patterns: Flora, Prism and Horizonfeatures - Western pine construction treated with water repellent and wood preservative. Natural wood interiors ready for painting, staining, or prefinished white. Dual weatherstripping for a weathertight seal. There are true divided lites available with insulated glass and 13/8" wide muntins, or single pane glass with 7/8". Also available are simulated divided lites featuring a grey anodized grille bar permanently applied between the glass and a permanently affixed wood interior grille. There are removable wood full-surround grilles and flat and profiled grilles between the glass. Standard chestnut bronze hardware and screens. Four additional styles of hardware in white or bright brass are optional.**CERTAINTED CORP.**, PO Box 860, Valley Forge, PA 19482 - (800) 233-8990 www.certainteed.comstyle - casement, double-hung, single-hung and picture bow (4 or 5-lite units) and angle bay, 30°frame - vinylcolors - tan • whitewarranty - lifetime limited coverage for original owner, SureStart™ protection for five years pays cost of materials and labor for repair or replacement of a defective windowglass options - 5/8" or 7/8" double glazing with warm edge low conductance spacer • "Thermafect" is a low-e glass with two microscopic layers of silver • tinted or obscure glass • argon gas fillfeatures - "CertaLite" interior grids give look of true divided lites. Hidden tabs attach them securely to sash with no gaps, easy to remove for cleaning. Available with grids between glass. Windows have a vinyl head and seat board and birch interior which can be painted or stained to match your decor. Balance system is based on a 3/4" wide stainless steel coil that applies a constant force. Similar to a retractable tape measure, the balance operates easily and exerts a steady pull — making sashes easy to lift and lower. Certainteed windows come with double weatherstripping. See page one for bow and bay window features diagram.**CRESTLINE WINDOWS & DOORS**, PO Box 800, Mosinee, WI 54455 - (715) 693-7000 www.crestlinewindows.comstyle - casement, double-hung and angle or box bay (30°, 45°)frame - aluminum-clad wood • vinyl • vinyl-clad woodcolors - almond • forest green • pewtertone • sierra brown •

white • 6 custom colors available

warranty - Lifetime warranty on casement and awning operating hardware. Lifetime warranty on vinyl mainframe and sash. 20-year warranty on insulated glass seal failure and a 2-year warranty on parts, hardware, millwork, and other materials.glass options - 3/4" insulated glass is standard • 3/4" SmartR® (northern) or SunPLUS4® (southern) is argon-filled insulated glass • tempered • gray or bronze tint • obscure • high altitude insulatedfeatures - There are 5/8" metal microblinds that fit between the sash and the screen for privacy and ventilation. The blinds are available in 27 colors. The center bay unit can be an operating window. Insulated divided lites, removable full-surround wood grilles or grilles in the airspace are available. Custom grille patterns are available. A copper roof is optional. Exterior frame of "CrestClad" and "PrimeCrest" models are factory primed with "CrestGuard" primer.**EAGLE WINDOW & DOOR, INC.**, PO Box 1072, Dubuque, IA 52004 - (800) 324-5354 www.eaglewindow.comstyle - casement, double-hung and angle or box bayframe - solid wood • aluminum-clad woodcolors - colony white • forest green • pebble tan • sierra bronze

• cinnamon toast • slate • country blue • harbor mist • sandstone • antique white

warranty - 20-year warranty on the glass, 10-year warranty on the partsglass options - Low-E Maximizer Plus — dual, sealed panes filled with argon gas with a low-e coating blocks 84 percent of the sun's ultraviolet rays • moisture-absorbing beads combine with a low thermal conductance edge seal to help eliminate condensationspecial decorative glass options - Decorelle glass — includes decorative panels made of leaded, beveled glass, grooved glass, colored glass (clear, medium blue, ruby red or dark green) and a variety of textured glasses. Caming (leading) options include brass and zinc. All decorative glass is encased between two panes of dual-sealed insulated glass for triple-pane insulation, cleaning convenience and protection from dust and damage. There are eight different styles to choose from.features - Head and seat boards offered in either natural birch or oak. Clear natural pine interiors allow you to paint or stain to match decor. Glass is fixed into place with interior wood strips. Wood windows are available with primed, unprimed or clear exteriors to allow a variety of finishing options. There are 40 designer colors from which to choose in addition to the standard colors. Two cam-action sash locks provide added security and safety.**GREAT LAKES WINDOWS**, PO Box 1896, Toledo, OH 43603 - (800) 666-0000 www.greatlakeswindow.comstyle - casement, double-hung and angle or box bayframe - vinylcolors - camel • earthtone • white • woodgrainwarranty - Lifetime-Plus warranty on the entire window — transferable to a new ownerglass options - Hi-R + Plus with argon gas has soft-coat low-e glass and steel spacer channel system • Full 7/8" "Intercept™" warm perimeter insulated glass spacer system that uses a unique U-shaped channel to separate glass panes and interrupt the natural flow of heat to cold. System also reduces the chill that can occur around the glass perimeter that may cause condensation and puddling. Intercept Glass is standard on most products • optional "EasyClean" glass coating protects the window from dirt and reduces cleaning frequencies.special decorative glass panels — hand-cut leaded clear or stained glass inlays surrounded by brass, lead or antique pewtertone caming, mounted between two sheets of annealed or safety-tempered insulated glass, available in 12 styles • beveled-leaded glass with brass or silver accents and 11 choices of patterned colonial or diamond grids and designs available • v-groove hand-cut glass

GREAT LAKES WINDOWS - cont'd.

features - Insulation along mulling points combined with R-core polyurethane insulation provides high energy efficiency. Stain-grade clear wood for the head, seat and jambs allows for many interior design options. Available with furniture-grade 1-1/4" thick head and seat boards in oak or birch. An optional polyurethane insulated seat is available that adds energy efficiency. Interior glazing bead deters glass removal from outside the home and provides a waterproof seal to protect insulating glass. The casement window has a multi-point casement locking system with multiple locks along the entire window jamb. All are activated simultaneously by a single locking handle. Center mullion opens with sash to provide an unobstructed view.

MARVIN WINDOWS & DOORS, PO Box 100, Warroad, MN 56763 - (800) 346-5128 www.marvin.com

style - awning, casement, double-hung or picture bow (3, 4, 5 or 6-lite units) and angle or box bay (30°, 45°, 90°) • single-hung or picture window curved glass • custom made bays with two sides or one side longer than the other

frame - solid wood • aluminum-clad

colors - bronze • brown • evergreen • pebble gray • white

warranty - 10-year on materials and workmanship

glass options - High R glazing — three panes of glass, two with low-e coatings, filled with argon or krypton gas • Low E II coating with argon is standard • bronze or gray tint • tempered • single glazing with removable energy panel

features - The windows have warm edge spacers that use low-conductive material, reducing temperature transfer. There is an electric operator system that features a motorized sash that can open and close casements and awnings by a wall switch, hand-held remote control or a rain sensor. It can control one window, the windows in one room or the entire house. Windows are preset to partially open for venting. There is a safety reverse which makes the window stop and back up if there's anything in the way as it closes. The UL approved motors are available in white or bronze. There are true divided lites available with single glazing or insulating glass. Also available are simulated divided lites and removable grilles. All of the lites can be custom ordered. The locks on the awning and casement windows are concealed so they don't interrupt the smooth wood interior. A crank is offered that has a flip handle, it folds into a flat position so it won't interfere with curtains or blinds. There is a lever operator available on awning units that has five different lock positions for a range of ventilation openings. Wood interior grilles have spring-loaded pins for removal and easy cleaning. Also available are grilles between the glass. See curved and corner window options on page one and typical window styles on page four.

SIMONTON WINDOWS, PO Box 1646, Parkersburg, WV 26102 - (800) 746-6686 www.simonton.com

style - awning, casement, picture bow, or angle bay

frame - vinyl

colors - tan • white • woodgrain • metal finishes: bronze, brass,

nickel, and copper

warranty - limited lifetime warranty

glass options - 7/8" double strength tempered glass • Low E/argon-filled glass is standard with a solid silicone foam spacer system • "Reflections" units are offered in a different Low E coating for each climate type • argon gas can replace air inside glass unit

features - "Metallure" windows are available in four finishes for interior and exterior application. Include copper, bronze, nickel, and brass. Finish contains more than 95 percent real metal. It is applied to the frame using a cold spray application process. The "Metallon" finishes completely covers the window and makes it into a decorative accessory for your house. Other decorative options include beveled-cut glass, brass grids and woodgrain interiors. Casements offer a single-lever, multi-point locking system and a durable weatherseal. Fusion welded frame and sash along with the chambered vinyl profiles increase the strength and insulation performance of "Metallure" windows. Head and seat boards available in 1 1/4" thick oak or birch veneer, and can be stained or painted to match the interior of your home. Cable support system is secured to the bottom of the seat board's exterior and travel through mullions inside the window. Optional woodgrain or brass grids or bevel-cut glass.

THERMAL INDUSTRIES, 301 Brushton Ave., Pittsburgh, PA 15221 - (800) 245-1540 www.thermalindustries.com

style - casement, double-hung, picture bow, bay, or garden window

frame - vinyl

colors - brown • earthtone • white

warranty - varies upon location, branches carry warranties

glass options - dual-glazed 13/16" insulating glass is standard • Peak Performance — soft coat low-e with argon gas fill • Super Peak Performance — triple panes with three layers of soft coat low-e, double layer krypton gas gaps and triple thermal break spacer-edge

special decorative glass options - "DreamGlas" — decorative glass available as etched, decra-led, brass can or jewel cut designs

features - Simulated wood grain laminate, available in pine or oak, that you can paint, stain to match existing wood trim, or maintain the natural look. "Thermal Industries" windows have a smooth, hand-sanded furniture finish of specially treated birch or optional oak veneer. Casements have a dual-action multi-point locking system. Also available is a folding handle that gives more clearance for window shades, etc. Internal muntin bars — colonial wood grille, diamond, prairie or geo designs. The windows have an "Over-The-Edge" maintenance-free design that keeps windows cleaner by keeping dust, dirt and water from collecting on the outside sill. An optional sill muffler is available to increase the sill R-value. See designs and decorative options for windows and roofing on page four.

TRACO, 71 Progress Ave., Cranberry Township, PA 16066 - (800) 468-7226 www.traco.com

style - casement, double-hung or picture bow (4, 5 or 6-lite units) and angle bay (30°, 45°)

frame - vinyl • "Power Two" vinyl interior with aluminum exterior

colors - beige • white • woodgrain — light oak or medium oak

interior finish, Trawood® — see description in features • Power Two has 12 possible color combinations — interior colors of white or Trawood® woodgrain with exterior colors of bronze • Hartford green • palace blue • river rouge red • sandstone • white

warranty - limited lifetime

glass options - Tempered safety glass is standard — difficult to break, if it does break, it crumbles into harmless pellets with blunt edges and cleans up easily, can withstand impacts up to 24,000 lbs. per-square-inch (12 tons), provides increased protection against high winds caused by hurricanes and tornadoes, virtually impossible to cut with a glass cutter, it deters intruders from entering your home because it is four times stronger than ordinary glass • Heat Mirror • low-e • argon gas fill • or titanium low-e

features - Trawood® provides a natural interior woodgrain finish, it has the look and feel of real wood. Provides beauty of wood while protecting natural resources of trees. It is not a laminate. It is a permanent baked-on finish, so it won't peel or scrape off. Because it's not wood, it won't swell. Maintenance commonly associated with wood (scraping, sanding, painting) is eliminated. Internal muntins are available in colonial or diamond styles.

WEATHER SHIELD WINDOWS & DOORS, PO Box 309, Medford, WI 54451 - (800) 222-2995 www.weathershield.com

style - casement, double-hung or picture bow, angle bay • corner window — glass is bent to a 90° angle, no seams or posts to obstruct view • picture window curved glass

frame - solid wood • vinyl-clad wood • aluminum-clad wood (pine, oak, cherry, maple, mahogany) • vinyl

colors - tan • white

warranty - 20-year against glass seal failures — 100% first 10 years, 50% remaining 10 years, 1-year on materials and workmanship

glass options - Value R-10 — three panes glass, two low-e coated surfaces and krypton gas between both airspaces • Value R-6 — three panes with two argon-only filled airspaces and two low-e surfaces • Value R-5 — one argon/krypton-filled airspace and two low-e surfaces • Value R-4 — one argon-filled airspace and two low-e surfaces • Insul — single airspace with low-e surface • single glazed

features - True divided lites are available with individual dual-sealed insulated glass lites and 7/8" wide bars. There are fashion grilles available in seven designs that use a concealed pin system that hides the pin within the wood so there are no visible pin holes when the grilles are in place. The casements are available with a crank, tee or round handle. They open 90° for ventilation and ease of cleaning. Airspace grilles and removable perimeter grilles available. Interiors are available in natural wood or prefinished white so they can be stained to match home's decor. See bow and bay installation instructions below.

WINSTROM, 70 North St., Park Forest, IL 60466 - (800) 946-7876 (708) 748-8200 www.winstromwindows.com

style - awning, casement, double-hung or picture bow (4, 5 or 6-lite units) and angle bay

frame - hardwood

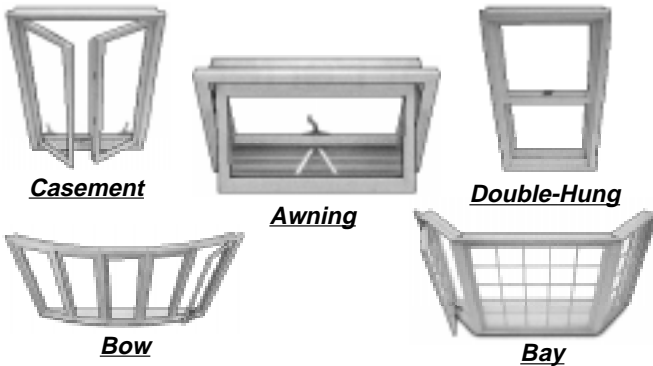
colors - beige • brown • white • woodgrain

warranty - lifetime on vinyl frame, 30-year on glass — 100% first 10 years, then prorated for next 20 years

glass options - 7/8" double glazing is standard • solar-bronze • obscure • LOF Energy Advantage® low-E glass, argon-filled airspaces, and structural foam warm-edge Super Spacer®

features - Vinyl windows are placed in a hand-crafted wooden frame. Interior hardwood veneer frames or seat boards are available in birch, oak or other special veneers including decorative laminates. Casements open a full 90° for easy inside cleaning. Dual action recessed tandem locks allow simultaneous latching. An R-10 insulated head and seat board option available. Sill supports available in a variety of finishes. In-glass muntins available. Prefinished wood sill supports available in two sizes, three colors.

Typical Window Styles by Marvin Windows



Options by Thermal Industries

Right is an Earthtone bow window with casements and deadlites featuring Gentle Blossom panels, part of the DreamGlas Collection.



Below is the Garden Window 290 with Oak Natural Wood Grain with trapezoid shaped vents. Garden Windows have concealed hinge casements.



Left is a Vycap Safari Brown bay window with a coppertone, standing seam, metal hip roof. The glass features the Circle Sash Muntin design.



Tips for Installing Bay and Bow Windows from Weather Shield

First Steps — Before ordering a new window, remove interior wood trim and measure the rough opening. Verify the header is adequate in size for the planned new unit.

You can order either a standard angle bay or bow window or a custom sized window for smoother installation. A custom sized window can be installed without making significant changes to the rough opening.

Next, evaluate the weight of the window. You'll need enough people to safely raise the window into the rough opening, usually one person outside and inside for every three feet of width of the window. If no exterior support exists, plan to provide temporary support while you are installing the unit. To do this, you can use a hydraulic jack, wood blocking and/or 2x4 studs for bracing. Make sure when you order the windows you request the cable supports to properly hold the window weight.

Installation Tips — Some angle bay/bow windows come with a complete unit including a headboard and side joint extension mounted with the glass.

Be sure the opening is correctly dimensional. It needs to be straight, level, plumb and square. Apply a bead of polyurethane around the exterior of the rough opening or backside of the nail fin. Raise the window up and sit the unit on the sill plate from the exterior.

As you ease the window into place, use the sill to bear the weight of the window. Make sure the new window supported on the exterior with a temporary brace around the entire perimeter until it is secured. Continue to position the window until the edges of the sideboards, head board and seat board are flush with the interior wall surface.

Fastening — Before fastening, center the window, checking to make sure the sill and seat board are level. Place shims under the seat board and above the sill plate to raise the window unit. The seat board must be in a level and straight position. Nail bottom corners through exterior trim, using nails or screws long enough in length to protrude into the framing material by 1-1/2". Place temporary supports on the exterior sill and raise the unit to level the seat board from interior to exterior.

Your next step is to measure diagonally on the interior. When the measurement is equal, nail the top of corners of exterior trim. Place a straight edge on the edge of window trim.

At this point, you need to push or pull the side jamb straight using a pry bar. Once you're sure the side jamb is straight you can fasten in place. Don't forget to check your side jambs for plumb. When the window is square it should be plumb from right to left.

Finishing Touches — Once the sides are nailed, the next step is to install the cable supports to a solid place such as a header or top plate. The angle of the cable should not be less than 45 degrees. Check your exterior sash reveal between the frame and sash. Adjust the cables as needed to equal top or bottom reveal from left to right on the operating sash.

It is recommended on larger units exceeding 4x5 ft. to install an angle iron across the bottom and attach the iron to each end to the cables. Depending on the window width, you may also need to install cables through several mulls on bow windows.