

Window Leakiness Guidelines

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In the Weatherization Assistant, there is a data field under the “Windows” tab of both NEAT and MHEA called “Leakiness” that allows the user to describe the air leakage characteristics of each window entered. NEAT and MHEA use this input to calculate the energy savings due to reduced air infiltration for window replacements, storms windows, and window weatherization (NEAT only). For each window retrofit measure, NEAT and MHEA add the energy savings due to reduced air infiltration to other energy savings associated with the measure to obtain the total energy savings.

Five options are allowed under the “Leakiness” data field: very tight, tight, medium, loose, and very loose. Guidance on the applicability of these options to various window types is described below. In addition, the leakiness of a typical window that is frequently encountered in homes served by the Weatherization Assistance Program across the country is identified.

- ~ **Fixed windows** — Fixed windows are sealed in their frames and cannot be opened. Fixed windows can include most skylights (windows in the ceiling), decorative windows in doors, and large picture windows. *The leakiness of a typical fixed window is **very tight**.*
- ~ **Casement windows** — Casement windows have one or two sashes that are hinged at the side and almost always project outwards. They usually have a cranking mechanism to open and close the sashes, and the sashes close by pressing against the frame. They also usually have a locking/latching mechanism that seals the window by forcing the sash against the frame and any installed weatherstripping. On casement windows with two sashes, a vertical framing bar is often present in the middle of the window that houses the locking mechanism. *The leakiness of a typical casement window is **very tight**.*
- K** **Very tight (typical)** — *Weatherstripping is present and in good condition. The locking mechanism is operable and securely presses the sash into the weatherstripping and window frame.*
 - **Tight** — A good seal is visually achieved between the sash and frame with the aid of a functional locking mechanism even though weatherstripping is absent or deteriorated.
 - **Medium** — A reasonable seal is visually achieved between the sash and frame when the window is closed as far as the cranking mechanism allows even though weatherstripping is absent. The locking mechanism is inoperative or does not help press the sash into the weatherstripping or frame.
 - **Loose** — A gap 1/8 inch or smaller exists between the sash and window frame when the sash is closed as far as the cranking/locking mechanism allows.
 - **Very loose** — A gap 1/8 inch or larger exists between the sash and window frame when the sash is closed as far as the cranking/locking mechanism allows.

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Single- or double-hung (vertical slider) windows — Windows with sashes that move up and down are vertical slider windows. In double-hung units, both sashes can slide vertically past one another. Only the bottom sash slides up and down in a single-hung window. *The leakiness of a typical non-wood vertical slider window is **tight** and the leakiness of a typical wood window found in older homes is **medium**.*

- Very tight — Each moveable sash is secure in its track and weatherstripping is present and must be in excellent condition (especially the brush-type weatherstripping at the sash to sash interface and the compression weatherstripping at the head (i.e., top) or sill (i.e., bottom)). A locking mechanism presses the two sashes together at their interface and presses each moveable sash into the head and/or sill.
- K** ***Tight (typical of non-wood windows)*** — *Each moveable sash is secure in its track although some slight play may be present. Weatherstripping is present and in good to fair condition (especially the brush-type weatherstripping at the sash to sash interface and the compression weatherstripping at the head or sill). A locking mechanism presses the two sashes together at their interface and presses each moveable sash into the head and/or sill.*
- K** ***Medium (typical of wood windows found in older homes)*** — *Each moveable sash is still operable in its track although play may be present and the sash may not sit perfectly horizontal when closed. Weatherstripping is absent or deteriorated (especially the brush-type weatherstripping at the sash to sash interface), but there are no visible gaps. A locking mechanism helps press each moveable sash into the head and/or sill but is not effective at pressing the two sashes together at their interface.*
- Loose — One (or both) moveable sash is loose in its track and the sash cannot be closed without leaving a gap 1/8 inch or smaller at the head or sill. There is some play (rattling) between sashes. Weatherstripping is absent or deteriorated (especially the brush-type weatherstripping at the sash to sash interface). The locking mechanism does not hold the two sashes together at their interface nor does it press each moveable sash into the head and/or sill.
- Very loose — One (or both) moveable sash no longer fits in its track and the sash cannot be closed without leaving a gap 1/8 inch or greater at the head or sill. There is considerable movement (rattling) between sashes. Weatherstripping is absent (especially the brush-type weatherstripping at the sash to sash interface). The locking mechanism is inoperative.

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Horizontal slider windows — Windows with sashes that move sideways are horizontal slider windows. Both sashes can slide horizontally past one another in a double-sliding window, and only one sash slides in a single-sliding window. Sliding glass doors are included in this window type. Horizontal slider windows are usually a little more leaky than comparable vertical slider windows. *The leakiness of a typical horizontal slider window is **medium**.*

- Very tight — Each moveable sash is secure in its track and weatherstripping is present and must be in excellent condition (especially the brush-type weatherstripping at the sash to sash interface and the compression weatherstripping at the end jamb (i.e., side)). A locking mechanism presses the two sashes together at their interface and presses each moveable sash into the end jamb .
- Tight — Each moveable sash is secure in its track although some slight play may be present. Weatherstripping is present and in good to fair condition (especially the brush-type weatherstripping at the sash to sash interface and the compression weatherstripping at the end jamb). A locking mechanism presses the two sashes together at their interface and presses each moveable sash into the end jamb.
- **K Medium (typical)** — *Each moveable sash is still operable in its track although play may be present and the sash may not sit perfectly vertical when closed. Weatherstripping is absent or deteriorated (especially the brush-type weatherstripping at the sash to sash interface), but there are no visible gaps. A locking mechanism helps press each moveable sash into the end jamb but is not effective at pressing the two sashes together at their interface.*
- Loose — One (or both) moveable sash is loose in its track and the sash cannot be closed without leaving a gap 1/8 inch or smaller at the end jamb. There is some play (rattling) between sashes. Weatherstripping is absent or deteriorated (especially the brush-type weatherstripping at the sash to sash interface). The locking mechanism does not hold the two sashes together at their interface nor does it press each moveable sash into the end jamb.
- Very loose — One (or both) moveable sash no longer fits in its track and the sash cannot be closed without leaving a gap 1/8 inch or larger at the end jamb. There is considerable movement (rattling) between sashes. Weatherstripping is absent (especially the brush-type weatherstripping at the sash to sash interface). The locking mechanism is inoperative.

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Awning and hopper windows — One type of awning window and most hopper windows are like casement windows. Both usually have just one sash, with the awning window being hinged at the top and opening outward and the hopper window being hinged at the bottom and opening inward. Like casement windows, the sash closes by pressing against the frame and a locking/latching mechanism is usually present that seals the window by forcing the sash against the frame and any installed weatherstripping. They may or may not have a cranking mechanism to open and close the sashes. The leakiness guidelines for casement windows should be followed to determine the leakiness of these types of awning and hopper windows. *The leakiness of a typical awning and hopper window that are like casement windows is **very tight**.*

Another type of awning window is like a jalousie window in that several window sashes are connected to a common crank so that the sashes open and close together at the same angle. Compared to jalousie windows, awning windows of this type have fewer sashes (just two to four sashes per window versus multiple window panes in jalousie windows), larger sashes (10 to 18 inches wide rather than 3 to 8 inches), and framed sashes (a lightweight frame supports each pane in the awning window) as apposed to the use of just window panes in jalousie windows. Awning windows of this type may have a locking mechanism that helps ensure complete window closure, whereas jalousie windows close and seal only as well as the cranking mechanism allows. *The leakiness of a typical awning window that is like a jalousie window is **medium**.*

- Very tight — Generally not applicable to awning windows that are like jalousie windows.
- Tight — The cranking mechanism is in good working order and all window sashes are securely attached to the cranking mechanism. Weatherstripping is present and must be in excellent condition. A locking mechanism presses the separate sashes to one another and to the window frame so that a tight seal is visually evident.

K ***Medium (typical of awning windows that are like jalousie windows)** — The cranking mechanism is in good working order and all window sashes are securely attached to the cranking mechanism. Weatherstripping is present but is only in fair condition. A locking mechanism helps to put the separate sashes in contact with one another and to the window frame, but the seals are not tight.*

- Loose — One or two window sashes are not securely attached to the cranking mechanism. Weatherstripping is absent or deteriorated. One or more of the interfaces where the window sashes overlap or the sash meets the window frame are not tight (1/8 inch gap or smaller) when the window is closed as far as the cranking/locking mechanism allows.
- Very loose — Multiple window sashes are not securely attached to the cranking mechanism. Weatherstripping is absent. Visible gaps (1/8 inch or larger) are evident at several of the interfaces where the window sashes overlap or the sash meets the window frame when the window is closed as far as the cranking

mechanism allows. The locking mechanism is inoperative or does not help press the sashes together or into the frame.

~ **Jalousie windows** — Jalousie windows are louvered windows, typically constructed of multiple horizontal panes (usually about 3 to 8 inches wide) that all open at the same angle when a crank near the bottom of the window is turned. *The leakiness of a typical jalousie window is loose.*

- Very tight — Generally not applicable to jalousie windows.
 - Tight — Generally not applicable to jalousie windows.
 - Medium — The cranking mechanism is in good working order, all window panes are securely attached to the cranking mechanism, and a tight glass to glass seal is visually obtained at the overlap of all windows panes.
- K** *Loose (typical)* — *One or two window panes are not securely attached to the cranking mechanism, or one or more of the glass to glass interfaces where the window panes overlap are not tight when the window is closed as far as the cranking mechanism allows.*
- Very loose — Multiple window panes are not securely attached to the cranking mechanism, or visible gaps are evident at several of the glass to glass interfaces where the window panes overlap when the window is closed as far as the cranking mechanism allows.

The guidance provided above based on window type should be modified as follows to take into account the condition of the window panes and the presence of storm windows:

~ **Window panes tightness** — Degrade the leakiness description one level if the window panes themselves have become significantly loose in their mounting and/or a small (i.e., half-dollar-sized) piece of window is broken out. Degrade the leakiness two levels if there is a larger hole in a window pane and/or an entire pane is missing.

~ **Storm window presence** — Upgrade the leakiness description one level if a storm window in average or better condition is installed.