

## Weatherization Assistant Window Leakiness Guidelines

December 18, 2014

The “Leakiness” data field in the Weatherization Assistant is found under the “Windows” tab of both NEAT and MHEA. The “Leakiness” field allows the user to describe the existing air leakage characteristics of each window entered. This input is used to calculate the energy savings due to reduced air infiltration for three window retrofit measures: window replacement, storms windows, and window weatherization (i.e., sealing). 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.

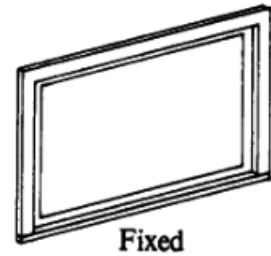
Five options are allowed under the “Leakiness” data field: Very Tight, Tight, Medium, Loose, and Very Loose. Guidance on the applicability of these options is provided below for each of the various window types that can be specified in NEAT and MHEA: Jalousie, Awning, Slider, Fixed, Door Window, Sliding Glass Door, and Skylight. The options that are typical for windows encountered in homes served by the Weatherization Assistance Program are also identified.

The guidance provided below is based primarily on the condition of the frame, sashes, and weatherstripping. Once a leakiness level is selected using the guidance below, it should be modified as follows to take into account the condition of the window panes and the presence of a storm window:

- **Condition of window panes**
  - No adjustment should be made if the window pane is cracked or if less than 2 sq. in. of glass is missing in the window (e.g., up to about a 1.5” diameter hole or a 1.5”x1.5” glass section).
  - Degrade the leakiness one level if 2 to 9 sq. in. of glass is missing in the window (e.g., about a 1.5” to 3.5” diameter hole or a 1.5”x1.5” to 3”x3” glass section).
  - Degrade the leakiness two levels if 9 to 25 sq. in. of glass is missing in the window (e.g., about a 3.5” to 5.5” diameter hole or a 3”x3” to 5”x5” glass section).
  - Specify the window to be **Very Loose** if more than 25 sq. in. of glass is missing in the window (e.g., a hole bigger than about a 5.5” diameter or a 5”x5” square).
- **Presence of storm window** — Upgrade the leakiness one level if a storm window in average or better condition is installed.

## FIXED WINDOW, DOOR WINDOW, AND SKYLIGHT

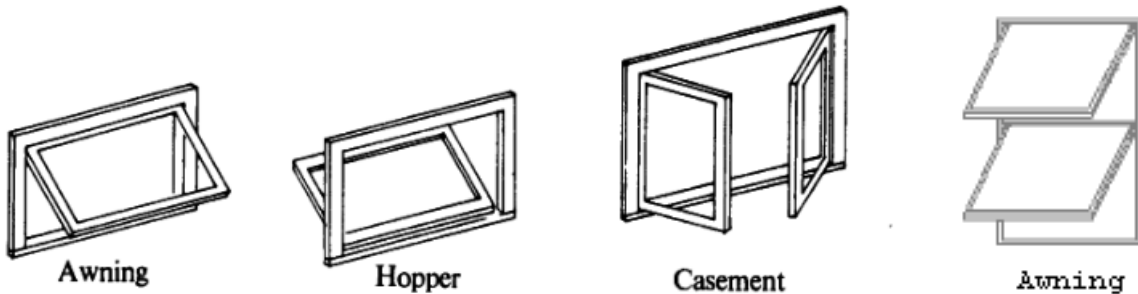
Fixed-type windows are sealed in their frames and cannot be opened. Fixed-type windows include large picture windows, decorative windows in doors, and most skylights (i.e., windows in the ceiling). *The leakiness of a typical fixed window, door window, or skylight is Very Tight.*



## AWNING WINDOW (INCLUDING HOPPER AND CASEMENT WINDOW)

The awning window type used in NEAT and MHEA includes hopper and casement windows. Most awning, hopper, and casement windows have just a single sash, although casement windows can have two sashes and awning windows can have two or three sashes. The sash of an awning window is hinged at the top of the window frame and opens outward and upward. The sash of a hopper window is hinged at the bottom of the window frame so that the window tilts open at the top. The sash of a casement window is hinged on the side of the window frame and swings out right or left. On a casement window with two sashes, a vertical framing member is often present in the middle of the window that houses a locking mechanism (not shown in the figure below).

These types of windows are often operated by a cranking mechanism. In awning and hopper windows with two or three sashes, a common crank is usually present so that the sashes open and close together at the same angle. When closed, the sashes press against the window frame and any installed weatherstripping to form a seal. In windows with multiple sashes, the sashes are usually designed to fit together at their interface when closed to form a tight seal. A lock or latch is usually present that further helps seal the window by drawing the sashes tightly against the frame, each other, and/or any installed weatherstripping.

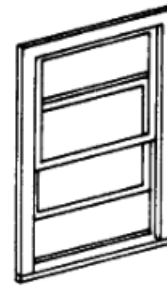


Awning, hopper, and casement windows with a single sash are generally tighter than other types of moveable windows. *The leakiness of a typical single-sash awning, hopper, or casement window is **Tight**, while the leakiness of a typical multiple-sash awning, hopper, or casement window is **Medium**.*

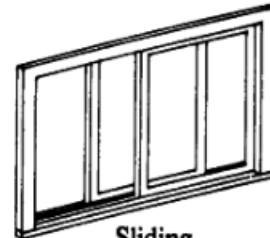
- Very Tight — The sashes and window frame fit together snugly to form a complete seal when the window is closed. The sashes and frame are in excellent condition, or they can be in average condition if weatherstripping in good condition is also present. The cranking and locking mechanisms are typically operable and assist in securely pulling the sashes and window frame together. Typical of a new window.
- ☞ **Tight (typical of a window with a single sash) — No visible gaps are observed between the sashes or between the sashes and the window frame when the window is closed. The sashes and frame are in average condition. Weatherstripping can be absent or deteriorated. The cranking and locking mechanisms are typically operable and assist in securely pulling the sashes and window frame together.**
- ☞ **Medium (typical of a window with multiple sashes) — Small gaps up to 1/8 in. are observable between the sashes and/or between the sashes and the window frame when the window is closed, even with the aid of a locking mechanism. The sashes and frame are in average to poor condition. Weatherstripping is usually absent or deteriorated.**
- Loose — Gaps up to 1/4 in. are observable between the sashes at their interface when the window is closed as much as the cranking and locking mechanism allow, and/or gaps up to 1/2 in. are observable between the sashes and the window frame when the window is closed. The sashes and frame are in poor condition, and may be warped or not square. Weatherstripping is absent or ineffective.
- Very Loose — Gaps 1/4 in. or greater are observable between the sashes at their interface when the window is closed, and/or gaps 1/2 in. or more are observable between the sashes and the window frame when the window is closes. The sashes and frame are in very poor condition and are likely warped or not square. Weatherstripping is absent or ineffective. The locking mechanism may not be able to be engaged.

## SLIDER WINDOW AND SLIDING GLASS DOOR

A vertical slider window has at least one sash that slides up and down within the window frame. In a double-hung slider window, both sashes slide vertically past one another. Only the bottom sash slides up and down in a single-hung slider window. A horizontal slider window (designated as “Sliding” in the figures) or sliding glass door has at least one sash that slides horizontally within the window or door frame. A locking mechanism is often present on a slider window that draws the two sashes together at their interface and helps press each moveable sash into the window frame.



Double or single-hung



Sliding

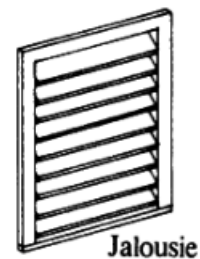
Horizontal slider windows and sliding glass doors are usually in poorer condition and, thus, leakier than comparable vertical slider windows. *The typical leakiness of an original double- or single-hung vertical slider window is **Medium** if installed in a house built in the 1960s and before, and **Tight** if installed in a house built in the 1970s and after. The leakiness of a typical horizontal slider window or sliding glass door is **Medium**.*

- **Very Tight** — The moveable sashes and window frame fit together tightly as designed when the window is closed such that no gaps are present. The sashes and frame are in excellent condition. Each moveable sash is secure and tight in its track. The moveable sashes are able to be closed such that the window locking mechanism can be fully engaged. Weatherstripping is present and in good condition. Typical of a new window.
- ☞ **Tight (typical of an original double- or single-hung vertical slider window installed in a home built in the 1970s or later)** — No visible gaps are observed between the sashes or between the moveable sashes and the window frame when the window is closed. The sashes and frame are in average condition. Each moveable sash is secure in its track although some play may be present. The moveable sashes are able to be closed such that the window locking mechanism can be engaged, although perhaps not fully. Weatherstripping is present and in good to fair condition.
- ☞ **Medium (typical of an original double- or single-hung vertical slider window installed in a home built in the 1960s or earlier, a horizontal slider window, or a sliding glass door)** — Small gaps up to 1/8 in. are observable between the sashes at their interface and/or between the moveable sashes and the window frame when the window is closed. The sashes and frame are in average condition. Each moveable sash is operable in its track although some play is likely. The moveable sashes may not sit perfectly horizontal or vertical when closed. The locking mechanism may not be able to be engaged. Weatherstripping is absent or deteriorated.

- Loose — Gaps up to 1/4 in. are observable between the sashes at their interface when the window is closed, and/or gaps up to 1/2 in. are observable between the moveable sashes and the window frame. The sashes and frame are in poor condition. Each moveable sash may be loose in its track. The moveable sashes likely do not sit horizontal or vertical when closed. The locking mechanism may not be able to be engaged. Weatherstripping is absent or ineffective.
- Very Loose — Gaps 1/4 in. or greater are observable between the sashes at their interface when the window is closed, and/or gaps 1/2 in. or more are observable between the moveable sashes and the window frame. The sashes and frame are in poor condition. Each moveable sash may no longer fit in its track. The moveable sashes likely do not sit horizontal or vertical when closed. There may be considerable movement (rattling) between sashes. The locking mechanism is likely to be inoperative. Weatherstripping is absent or ineffective.

## JALOUSIE WINDOW

A jalousie window is made up of multiple horizontally-mounted glass louvers or slats. The glass louvers are usually 3” to 5” wide and are mounted in a metal panel. A crank typically rotates the glass louvers outward like a shutter when open. The glass louvers overlap each other slightly when closed. *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 — A tight glass-to-glass seal is visually obtained at the overlap of all the glass louvers when the window is closed. The cranking mechanism is in good working order. All window panes are securely attached to the cranking mechanism. Typical of a new window.
- ☞ **Loose (typical)** — **Small gaps up to 1/8 in. are observable between the glass louvers when the window is closed. One or two of the glass louvers may not be securely attached to the cranking mechanism. The cranking mechanism may not be able to fully rotate the glass louvers to their fully closed position.**
- Very Loose — Gaps 1/8 in. or greater are observable between the glass louvers when the window is closed. Multiple glass louvers may not be securely attached to the cranking mechanism. The cranking mechanism is likely not able to fully rotate the glass louvers to their fully closed position.