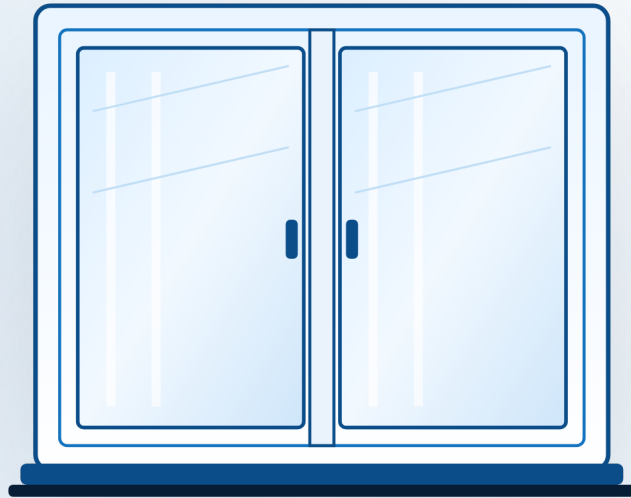




The Complete

Window Replacement Buying Guide

How to compare windows, contractors, installation methods, quotes, warranties, and long-term value — before you spend thousands.

Compare fairly

Score up to five quotes on one apples-to-apples worksheet

Understand the specs

U-factor, SHGC, ER, glazing and frames in plain English

Buy with confidence

Spot hidden costs, vague wording, and pressure tactics

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How to use the worksheets. Section 29 collects all fifteen printable worksheets (M1–M15). Print that section on its own and fill it in as you go — from first inspection to final sign-off.

How to Use This Guide

This guide follows the real order of a window project — from noticing a draft to signing off on the finished work. You do not need to read it cover to cover in one sitting.

Read it in the order you'll actually need it

The sections below mirror the buying process. If you already know windows need replacing, skip ahead to specifications and quotes. If you're not sure yet, start at Section 5.

1 Diagnose the problem §5

Work out what is actually wrong before you shop. Some symptoms point to a small repair, not a full replacement.

2 Define your priorities §29

Rank comfort, efficiency, noise, appearance, security, and budget. Your priorities decide which trade-offs are right for you.

3 Learn the specifications §8-10

Understand frames, glazing, and the energy label so a sales rep can't use jargon to steer you.

4 Decide the installation scope §14-15

Full-frame vs. insert/retrofit changes price, disruption, and what problems get fixed.

5 Request comparable quotes §17

Send every contractor the same written scope so their prices can actually be compared.

6 Screen the contractors §19

Verify identity, insurance, references, and who does the installation.

7 Compare total value §18

Score quotes side by side on specs, warranty, and inclusions — not price alone.

8 Review the contract §21

Check that every promise, spec, and date is written down before you sign.

9 Inspect the installation §25

Use the final checklist and document any deficiencies before final payment.

10 Store your records §26

Keep labels, warranties, permits, and photos where you can find them for years.

→ KEY TAKEAWAY

Print the worksheets in Section 29 and fill them in as you go. The quote-comparison and contractor-interview sheets are where this guide saves you the most money — they force every contractor onto the same terms.

How the boxes work

→ KEY TAKEAWAY

The single most important point in a section, in one or two sentences.

△ TECHNICAL NOTE

A plain-English explanation of a spec, standard, or how something works.

🕒 QUESTIONS TO ASK

- Specific questions to put to a supplier or installer.

⚠️ BUYER WARNING

A pattern, tactic, or omission that commonly costs homeowners money or comfort.

Superscript numbers like ¹³ point to the numbered sources in Section 31. Section references like §14 are clickable in the digital edition.

The Window Replacement Decision in 10 Steps

The whole process on two pages. Each step links to the section that covers it in full and, where relevant, to a printable worksheet (M#) in Section 29.

1 Confirm replacement is the right call

Fog between panes, rot, or racked frames point to replacement; a stuck lock or worn weatherstrip may be a cheap repair.

[SEE §5](#)[M1](#)

2 Inventory every opening

Walk the house room by room. Note size, style, floor level, condition, and access for each window.

[SEE §29](#)[M2](#)

3 Set your priorities & budget

Decide what matters most — comfort, efficiency, noise, looks, security — and a realistic total budget.

[SEE §16](#)[M3](#)

4 Choose frame & glass direction

Narrow frame material and glazing to a shortlist that fits your climate and priorities.

[SEE §8-9](#)

5 Pick your target performance

Choose a U-factor / Energy Rating target and note any egress or safety-glass openings.

[SEE §10,§13](#)

6

Decide installation scope

Full-frame or insert? Inspect for hidden frame damage before letting anyone decide for you.

SEE §14

7

Write one scope, send to 3-5

Give every contractor the identical written scope so quotes are comparable.

SEE §17

M4

8

Screen the contractors

Verify business, insurance, references, and who actually installs.

SEE §19

M5

9

Score quotes on total value

Use the comparison worksheet; weigh specs, warranty, and inclusions, not just price.

SEE §18

M6

10

Sign, inspect, document, pay

Get every promise in the contract, inspect against the checklist, hold final payment until deficiencies are fixed.

SEE §21, §25

M7

→ KEY TAKEAWAY

If you do only three things from this guide: (1) send every contractor the *same* written scope, (2) compare quotes on the worksheet in Section 18 rather than on price alone, and (3) never let anyone choose full-frame vs. insert installation without inspecting your existing frames first.

Do Your Windows Actually Need Replacement?

Replacement is sometimes the right answer and sometimes an expensive way to fix a \$40 problem. Start by matching the symptom to the likely cause — several common complaints have a repair path that costs a fraction of a new window.

Read the symptom before you shop

A window is a system: glass, sash, frame, hardware, weatherstripping, and the seal between the window and the wall. When something goes wrong, the fix depends on *which* part failed. The table below groups the most common complaints and shows the range of responses — from a minor repair to full replacement to "investigate further before deciding."

Symptom you notice	Most likely cause	Typical response	Direction
Fog / haze between the panes	Sealed glass unit (IGU) seal failure	Glass-unit replacement; sometimes whole-sash	Replace IGU or sash
Cracked or broken glass	Impact, thermal stress, or defect	Glass-only replacement if frame is sound	Glass replacement
Window won't stay open / hard to operate	Failed balance, worn rollers, or bent hardware	Hardware / balance repair	Repair hardware
Drafts around the sash	Worn or compressed weatherstripping	Weatherstrip replacement	Reseal / weatherstrip
Drafts around the trim / wall	Failed air seal at the rough opening	Re-air-seal; may need reinstallation	Investigate install
Water on the sill after rain	Failed sealant, flashing, or drainage	Sealant / flashing / drainage correction	Water-management fix
Soft, spongy, or rotted frame	Long-term water intrusion into the frame	Full-frame replacement (usually)	Replace window
Condensation on the inside glass	High indoor humidity + cold glass surface	Manage humidity first (see §11)	Diagnose humidity

Symptoms — continued

Symptom you notice	Most likely cause	Typical response	Direction
Peeling paint / swollen wood	Moisture in a wood frame	Repair + refinish, or replace if advanced	Repair or replace
Rattling / loose sash	Worn hardware or a racked frame	Hardware repair; replace if frame is out of square	Repair or replace
Persistent outside noise	Thin single glazing or poor seals	Consider acoustic glazing (see §12)	Upgrade glazing
Won't lock / feels unsafe	Broken lock or misaligned sash	Lock / hardware repair	Repair hardware
You simply dislike how they look	Cosmetic only	No performance reason to replace	Optional upgrade

Symptoms often overlap. When two or more serious signs appear together — for example fog plus a soft frame — replacement usually wins.

⚠ BEWARE THE “THEY ALL HAVE TO GO” PITCH

A window that fogs, a window with a worn balance, and a window you simply dislike are three different problems. A rep who inspects for ten minutes and concludes every opening needs replacing is selling, not diagnosing. Ask them to walk you through the specific failure on each window they list.

Repair versus replace — a decision table

Use this as a first filter, not a final verdict. A qualified glazier or installer who has physically inspected the window should confirm the cause before you spend money either way.

Your situation	Likely direction	Why
Only the glass is foggy; frame & sash are solid	Repair	Replace the insulating glass unit (or the sash) — far cheaper than a new window.
Glass is cracked; everything else works	Repair	Glass-only replacement if the frame is sound and square.
Hardware, balances, or locks are the only issue	Repair	Order replacement parts; many are still available even for older units.
Drafts trace to worn weatherstripping	Repair	Replace weatherstripping; recheck for drafts afterward.
Frame is rotted, spongy, or crumbling	Replace	Rot means water has been getting in; full-frame replacement lets you correct the opening.
Frame is visibly out of square / racked	Replace	A twisted frame will never seal well; repair rarely holds.

Decision table — continued

Your situation	Likely direction	Why
Multiple serious symptoms on the same window	Replace	When glass, seals, and hardware are all failing, repair costs approach replacement.
Single-pane windows and comfort is the goal	Consider replace	Upgrading to insulated glazing is the reliable comfort fix; weigh cost vs. benefit.
Inside-glass condensation only	Investigate	Usually an indoor-humidity issue, not a window defect (see §11) — fix humidity first.
Drafts at the trim, not the sash	Investigate	May be a failed air seal at the opening; a blower-door or infrared check can confirm.
You just want a new look	Optional	No performance driver; treat as a discretionary upgrade and budget accordingly.

Getting the diagnosis right

☉ **QUESTIONS TO ASK BEFORE YOU ACCEPT “REPLACE”**

['Exactly which component failed on this window — the glass unit, the sash, the frame, or the seal to the wall?', 'Can the insulating glass unit or sash be replaced instead of the whole window?', 'Is the frame itself rotted or out of square, or is it sound?', 'If it's a draft, is it coming from the sash or from the trim/wall around the opening?', 'What would you do if this were your own home, and why?']

➔ **KEY TAKEAWAY**

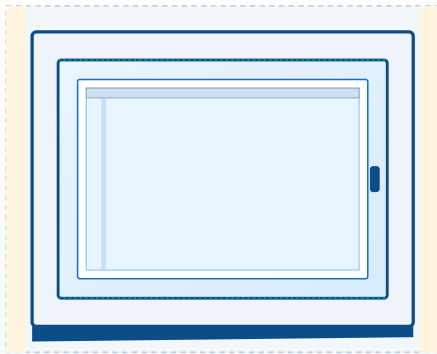
Match the fix to the failed part. Fog between panes → often a glass-unit swap. Rot or a racked frame → replacement. Inside-glass condensation → usually a humidity problem, not a window defect. Getting this right is the biggest early saving in the whole project.

⚠ **TECHNICAL NOTE**

A quick field test for a failed seal: on a cool morning, wipe both glass surfaces. If the haze is *between* the panes and won't wipe away from either side, the sealed unit has failed. Surface condensation, by contrast, wipes off.

Understanding the Anatomy of a Window

A dozen parts, each of which can fail on its own. Knowing the names lets you follow a quote line by line and tell the difference between a component repair and a whole-window replacement.



Simplified cross-section of an operable window in its opening.
Orange = insulation/air seal at the rough opening; teal dashes = weatherstripping; blue bar = warm-edge spacer inside the IGU.

1 Frame

The fixed outer structure anchored into the wall opening. It carries the sash and transfers loads to the building. Frame material drives thermal performance, durability, and maintenance.

2 Sash

The moving (or fixed) part that holds the glass. In an operable window the sash tilts, slides, or swings; in a fixed window it's stationary.

3 Glazing

The glass itself. Modern windows use an insulating glass unit rather than a single sheet.

4 Insulating glass unit (IGU)

Two or three panes sealed around the edge with a gas-filled gap between them. The IGU does most of the insulating work.^[8]

5 Spacer

The bar around the edge of the IGU that holds the panes apart and contains desiccant to keep the gap dry. “Warm-edge” spacers conduct less heat than aluminum.^[11]

6 Weatherstripping

Flexible seals where the sash meets the frame, blocking air and water when the window is closed. It wears out and is often repairable on its own.

7 Lock / hardware

Latches, cam locks, and operators that secure and move the sash. Multi-point locks pull the sash tight against the seal at several points.

8 Operator / balance

The mechanism that moves and holds the sash — a crank on a casement, a spring or block-and-tackle balance on a hung window.

The rest of the assembly

9 Jamb

The vertical sides of the frame.

10 Sill

The bottom horizontal member. A properly sloped sill sheds water to the outside.

11 Head

The top horizontal member of the frame.

12 Exterior cladding / capping

The exterior finish (often aluminum) that covers and protects the frame and surrounding trim from weather.

13 Interior trim / casing

The interior finish that covers the gap between the frame and the wall.

14 Rough opening

The framed hole in the wall the window sits in. Its condition matters as much as the window.

15 Flashing

Layered materials that direct water out and away from the opening, integrated with the wall's water-resistive barrier.

16 Insulation / air seal

Low-expansion foam or backer rod and sealant filling the gap between frame and rough opening to stop drafts and heat loss.

17 Sealant

Exterior joint sealant (caulk) that closes gaps against water and air at the perimeter.

→ KEY TAKEAWAY

The IGU, spacer, and edge seal are where most “foggy window” failures happen — and they can often be replaced without touching the frame. The air seal, flashing, and sloped sill are where most *installation* failures happen — and a premium window can't overcome a bad one.

△ TECHNICAL NOTE

Two independent seals do different jobs. The **IGU edge seal** keeps gas in and moisture out of the glass unit. The **perimeter air/water seal** keeps weather out of the wall. A quote should make clear that both are addressed.

Window Styles & Operating Types

Style is not just looks. How a window opens changes how well it seals, how it ventilates, how you clean it, and whether it can serve as a fire escape. Here's how the common types compare.

Casement

Hinged at the side, cranks outward like a door.

Ventilation	Excellent — the whole opening ventilates and can catch side breezes.
Air sealing	Very good — the sash presses tight against the frame seal when closed.
Cleaning	Easy from inside on most units.
Security	Good — multi-point locks are common.
Typical use	Bedrooms, over sinks, anywhere you want maximum airflow.
Best for	Full-opening ventilation, tight seal, good views.
Watch-outs	Sash swings into the outside; wind can catch it; cranks can wear.

Awning

Hinged at the top, swings outward from the bottom.

Ventilation	Good — can stay open in light rain.
Air sealing	Very good — closes tight against the frame.
Cleaning	Exterior harder to reach on upper floors.
Security	Good.
Typical use	High on walls, basements, paired above/below fixed glass.
Best for	Rain-shedding ventilation, tight seal, privacy.
Watch-outs	Limited opening size; projects outward.

Single-hung

One sash slides vertically; the top is fixed.

Ventilation	Moderate — only the bottom half opens.
Air sealing	Good, though sliding seals wear over time.
Cleaning	Harder — top sash doesn't move on most units.
Security	Good.
Typical use	Traditional facades, budget-conscious projects.
Best for	Familiar look, fewer moving parts, lower cost.
Watch-outs	Half the opening ventilates; exterior cleaning is harder.

Double-hung

Both sashes slide vertically; many tilt in for cleaning.

Ventilation	Good — open top and bottom for airflow.
Air sealing	Good; sliding weatherstrip wears over time.
Cleaning	Easy if sashes tilt in.
Security	Good.
Typical use	Traditional and heritage-style homes, upper floors.
Best for	Both-sash airflow, tilt-in cleaning, classic look.
Watch-outs	More seals to maintain than a casement.

Styles — continued

Slider

One or more sashes slide horizontally.

Ventilation	Moderate to good depending on how many panels open.
Air sealing	Moderate — horizontal seals are harder to keep tight.
Cleaning	Easy for the operable panel.
Security	Moderate — add a secondary lock or bar.
Typical use	Wide openings, basements, modern facades.
Best for	Wide views, simple operation, no projecting sash.
Watch-outs	Tracks collect dirt; sliding seals wear.

Fixed / picture

Does not open at all.

Ventilation	None — it's sealed.
Air sealing	Excellent — no moving seal to fail.
Cleaning	Interior only.
Security	High — nothing to force open.
Typical use	Large views, high walls, paired with operable units.
Best for	Best air-tightness, biggest unobstructed glass, lowest cost per area.
Watch-outs	No ventilation; can't serve as egress.

Hopper

Hinged at the bottom, tilts inward from the top.

Ventilation	Good for its size.
Air sealing	Very good.
Cleaning	Easy from inside.
Security	Good.
Typical use	Basements, bathrooms, small openings.
Best for	Tight seal, good for tight spots, deflects incoming air upward.
Watch-outs	Small opening; swings into the room.

Tilt-and-turn

Turns inward like a door or tilts in at the top, via one handle.

Ventilation	Excellent and adjustable.
Air sealing	Excellent — multi-point hardware pulls it tight.
Cleaning	Easy — swings fully inward.
Security	Very good.
Typical use	Contemporary homes, egress where an inward swing suits.
Best for	Two ventilation modes, superb seal, easy cleaning.
Watch-outs	Heavier hardware; swings into the room; higher cost.

Styles — continued

Bay

Three units angled outward to project from the wall.

Ventilation	Depends on the operable units within it.
Air sealing	Depends on the units; more joints to seal.
Cleaning	Interior easy; exterior needs a ladder.
Security	Depends on units.
Typical use	Living rooms, adding light and a sense of space.
Best for	Adds interior space and light, architectural feature.
Watch-outs	Costly; more joints; may need structural support.

Bow

Four or more units in a gentle curved arc.

Ventilation	Depends on operable units.
Air sealing	More joints to seal than a single unit.
Cleaning	Interior easy; exterior needs access.
Security	Depends.
Typical use	Wide walls, curved architectural feature.
Best for	Panoramic curved view, lots of light.
Watch-outs	Costliest of the projecting styles; more seams.

Garden

A small box projecting outward with glass on top for plants.

Ventilation	Side vents provide some airflow.
Air sealing	More surfaces and joints to seal.
Cleaning	Interior only, and awkward.
Security	Lower — it projects and has more glass.
Typical use	Kitchens, herb gardens.
Best for	Shelf space and light for plants.
Watch-outs	More heat loss/gain; more seals; limited use.

Custom / shaped

Arches, circles, triangles, and other geometry, usually fixed.

Ventilation	Usually none (fixed).
Air sealing	Excellent when fixed.
Cleaning	Interior only.
Security	High (fixed).
Typical use	Gables, transoms, architectural accents.
Best for	Design freedom; fills unusual openings.
Watch-outs	Higher cost; long lead times; rarely operable.

Style comparison matrix

→ KEY TAKEAWAY

For a tight seal in a cold climate, crank-operated casement and awning windows generally seal better than sliding styles, because the sash compresses against the frame rather than sliding past a seal. Sliding and hung windows trade a little air-tightness for simplicity and a lower price.

A quick side-by-side. “Varies” appears where performance depends on the specific operable units chosen (as in bay, bow, and garden windows).

Style	Ventilation	Air seal	Cleaning ease	Security	Can serve egress?*
Casement	Excellent	Very	Varies	Good	Often
Awning	Good	Very	Varies	Good	Often
Single-hung	Moderate	Good	Varies	Good	Maybe
Double-hung	Good	Good	Varies	Good	Often
Slider	Moderate	Moderate	Varies	Moderate	Maybe
Fixed / picture	None	Excellent	Varies	High	No
Hopper	Good	Very	Varies	Good	Often
Tilt-and-turn	Excellent	Excellent	Varies	Very	Often
Bay	Varies	Varies	Varies	Varies	Maybe
Bow	Varies	Varies	Varies	Varies	Maybe
Garden	Varies	Varies	Varies	Lower	Maybe
Custom / shaped	Varies	Excellent	Varies	High	No

*Egress capability depends on the openable dimensions of the specific unit and your local code — see Section 13. A style listed as “Often” still must be sized to meet the clear-opening rule.

🕒 QUESTIONS TO ASK ABOUT STYLE

- Which style best seals for our climate and which walls face prevailing wind?
- Does any bedroom or basement unit need to meet egress — and does this style's openable size qualify?
- How will we clean the exterior of upper-floor windows — does the sash tilt in?
- For projecting styles (bay/bow/garden), is extra structural support or a roof cap included?

→ KEY TAKEAWAY

Match style to the job of each opening: casement/awning where sealing and airflow matter most, fixed for big views, hung/slider for budget and a traditional look, tilt-and-turn where you want both a tight seal and easy cleaning. Mixing styles across a house is normal and often smart.

Frame-Material Comparison

The frame decides thermal performance, durability, maintenance, and much of the price. There is no single “best” material — only the best fit for your climate, priorities, and budget. Here's an honest look at each.

⚠ THERE IS NO UNIVERSALLY “BEST” FRAME

Any rep who tells you one material wins for every home is oversimplifying. Vinyl, fibreglass, aluminum, wood, wood-clad, and composite each trade cost, looks, strength, and maintenance differently. Judge the *specific product line* and its certified performance, not just the material category.

Vinyl (uPVC)

Thermal	Good — the hollow chambers and low conductivity of PVC insulate well; better chambered profiles perform better.
Durability	Good; resists moisture and won't rot or corrode. Colour is usually through-body or factory-finished.
Maintenance	Very low — occasional cleaning; no painting.
Appearance	Clean, modern; historically limited to lighter colours, though darker factory finishes are now common.
Movement	Expands and contracts more than other materials with temperature — a design consideration for large or dark units.
Strength	Moderate; large spans may need reinforcement.
Moisture	Excellent — impervious to moisture.
Repairability	Limited — damaged profiles are usually replaced, not repaired.
Colour options	Widening range, including some dark exterior finishes.
Cost position	Typically the most budget-friendly.
Good for	Most residential replacements; cold climates.
Common weakness	Can distort under extreme heat; welds can be a weak point on poor units; dark colours stress the material.

Fibreglass

Thermal	Very good — low conductivity, and it expands at nearly the same rate as glass, which is gentle on seals.
Durability	Excellent — dimensionally stable and strong across a wide temperature range.
Maintenance	Low — can be left as-is or painted.
Appearance	Slim sightlines; can be painted almost any colour.
Movement	Very low expansion/contraction — close to that of glass, which helps seals last.
Strength	High — strong enough for large units with slim frames.
Moisture	Excellent.
Repairability	Good — can be refinished/painted.
Colour options	Wide, since it takes paint well.
Cost position	Higher than vinyl; often mid-to-upper range.
Good for	Large units, harsh climates, long service life priorities.
Common weakness	Fewer manufacturers and installers offer it; cost.

Frame materials — continued

Aluminum

Thermal	Poor on its own — metal conducts heat readily; a <i>thermal break</i> (an insulating barrier in the frame) is essential in cold climates.
Durability	Excellent — very strong and long-lasting; won't rot or warp.
Maintenance	Low.
Appearance	Very slim, modern sightlines; wide colour range via anodizing or paint.
Movement	Expands and contracts moderately; metal.
Strength	Highest — supports the largest, slimmest frames.
Moisture	Excellent (won't rot); can corrode in salt air without proper finish.
Repairability	Good — durable finish; dents are hard to fix.
Colour options	Very wide.
Cost position	Varies; thermally-broken residential units are mid-to-upper range.
Good for	Large openings, contemporary design, commercial and storefront.
Common weakness	Without a good thermal break, high heat loss and condensation risk in cold climates.

Wood

Thermal	Very good — wood is naturally insulating.
Durability	Good <i>if</i> maintained; vulnerable to moisture, rot, and insects if neglected.
Maintenance	High — needs periodic painting/sealing to stay protected.
Appearance	Warm, traditional; can be stained or painted any colour; favoured for heritage homes.
Movement	Low movement, but absorbs moisture and can swell.
Strength	Good.
Moisture	Poor unless diligently sealed and maintained.
Repairability	Excellent — can be sanded, repaired, and refinished for decades.
Colour options	Any — paint or stain.
Cost position	Upper range.
Good for	Heritage homes, traditional interiors, where appearance is paramount.
Common weakness	Maintenance burden; rot and swelling if water gets in.

Frame materials — continued

Wood-clad

Thermal	Very good — wood interior insulates; exterior cladding protects it.
Durability	Very good — the exterior cladding (aluminum or fibreglass) shields the wood from weather.
Maintenance	Low outside, moderate inside — interior wood may still need occasional finishing.
Appearance	Real wood interior with a low-maintenance exterior in a wide colour range.
Movement	Low.
Strength	Good.
Moisture	Very good — cladding keeps water off the wood.
Repairability	Interior wood is repairable; exterior cladding less so.
Colour options	Wide exterior colours; natural interior.
Cost position	Upper range.
Good for	Homeowners who want a wood interior without the exterior upkeep.
Common weakness	Cost; if the cladding is breached, water can still reach the wood.

Composite

Thermal	Good to very good — engineered blends (e.g., wood fibre and polymer) aim to combine insulation and stability.
Durability	Very good — resists rot, moisture, and warping.
Maintenance	Low.
Appearance	Varies by product; often a range of solid colours.
Movement	Low — engineered for stability.
Strength	Good to high depending on the blend.
Moisture	Excellent.
Repairability	Limited — typically replaced, not repaired.
Colour options	Product-dependent.
Cost position	Mid-to-upper range.
Good for	Homeowners wanting stability and low maintenance without pure vinyl.
Common weakness	Performance varies widely between products — compare the specific line, not the category.

Frame materials at a glance

This chart is a starting point, not a ranking. “Higher cost” is not the same as “better for you.” Weigh each row against your own priorities from Section 29.

Material	Insulation	Durability	Maintenance need	Colour range	Relative cost	Notes
Vinyl	Higher	Higher	Very low	Mid	Lower	Impervious to rot; big cold-climate share
Fibreglass	Higher	Very high	Lower	Higher	Higher	Very stable; gentle on seals
Aluminum*	Lower	Very high	Lower	Higher	Mid	Needs a thermal break in cold climates
Wood	Higher	Mid	Higher	Mid	Higher	Repairable for decades if maintained
Wood-clad	Higher	Higher	Mid	Higher	Higher	Wood look, low-maintenance exterior
Composite	Higher	Higher	Lower	Higher	Mid	Varies by product — compare the line

*Aluminum's insulation rating assumes a thermally-broken residential frame; non-broken aluminum performs poorly in cold climates. Ratings are general and vary between specific product lines.

❓ QUESTIONS TO ASK ABOUT THE FRAME

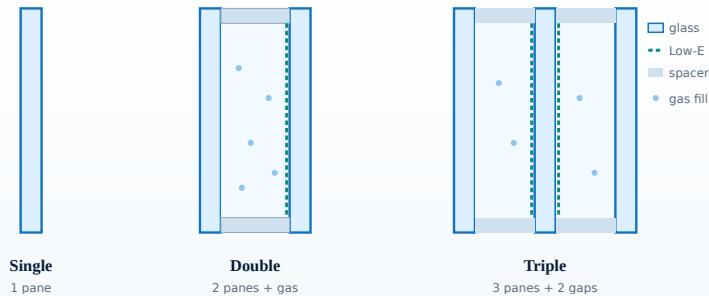
- What is the whole-window U-factor / Energy Rating of this exact frame-and-glass combination — not just the glass?
- For aluminum: is the frame thermally broken, and what's the resulting rating?
- For vinyl in a dark colour: is the profile rated for that colour without distortion?
- For wood/clad: what maintenance does the interior finish need, and how is the wood protected?
- Is the colour through-body or a surface finish, and what's the finish warranty?

➔ KEY TAKEAWAY

Don't buy the material — buy the *certified performance* of the specific product. Two vinyl windows, or two aluminum windows, can perform very differently. Ask for the whole-window U-factor / ER of the exact configuration you're quoted, and compare those numbers (Section 10).

Glass & Glazing Options

The glass does most of a window's insulating, solar-control, safety, and noise work. Understanding a few building blocks — panes, coatings, gas fills, and spacers — lets you read any glass package a contractor quotes.



How glazing layers build up. Each added pane and gas-filled gap slows heat transfer; a Low-E coating on an internal surface reflects heat back toward its source. Adding a third pane brings a second gap and a second coating opportunity.

Panes: single, double, triple

Single glazing is one sheet of glass — common in old windows and a major source of heat loss and drafts. **Double glazing** seals two panes around a gas-filled gap, roughly halving heat loss versus single glass.^[10] **Triple glazing** adds a third pane and a second gap for still-lower heat loss and warmer interior glass, at more weight and cost.

Low-E coatings

A **low-emissivity (Low-E)** coating is a microscopically thin, near-invisible metallic layer on a glass surface. It reflects heat back toward its source while letting light through — keeping warmth inside in winter and, with the right coating, blocking solar heat in summer.^[7] Different Low-E coatings are tuned for different climates and orientations, which is why the same window can be ordered in several glass packages.

Gas fills

The gap is usually filled with **argon** — an inert, harmless gas that insulates better than air and is inexpensive. **Krypton** insulates even better and is used in thinner gaps or triple units, at higher cost.

^[9]

Spacers, safety glass & specialty options

△ TECHNICAL NOTE

An insulating glass unit (IGU) is the sealed sandwich of panes, spacer, desiccant, and gas. Manufacturers report roughly R1 for single glass, about R2 for a plain double unit, near R3 once a Low-E coating is added, and around R4 with an argon fill — illustrating how coatings and gas fills, not just pane count, drive performance.^[10]

Spacer systems

The **spacer** holds the panes apart and carries the desiccant that keeps the gap dry. Traditional aluminum spacers conduct heat, creating a cold edge where condensation forms. **Warm-edge spacers** (foam, polymer, or stainless steel) conduct far less heat, raising the edge-of-glass temperature and improving comfort and condensation resistance.^[15]

△ TECHNICAL NOTE

Lawrence Berkeley National Laboratory research found insulating spacers can reduce a window's total U-value by around 12% compared with aluminum spacers in higher-performance glazing — a meaningful gain from a part most buyers never think about.^[15]

Tempered glass

Tempered (toughened) glass is heat-treated to be far stronger than ordinary glass and to break into small, relatively blunt pieces rather than sharp shards. It's required by code in certain locations (see Section 13).

Laminated glass

Laminated glass bonds two panes to a tough interlayer. It holds together when broken, improves security, blocks most UV, and — because of its mass and the interlayer — can noticeably reduce noise (Section 12).

Grids and dividers

Decorative **grids** (muntins) create a divided-light look. They can sit **between the panes** (sealed inside the IGU, so the glass wipes clean) or be **applied** to the surfaces. Between-the-glass grids are lowest-maintenance; surface grids look more authentic on heritage homes. Grids slightly reduce the clear glass area.

Tinted & reflective glass

Tinted and **reflective** coatings reduce glare and solar heat gain, at the cost of some visible light and, for reflective glass, a mirrored exterior look.

Obscure, frosted & privacy glass

Frosted, obscured, or patterned glass passes light while blocking the view — common in bathrooms and entry sidelites. “Privacy” glass ranges from simple texture to switchable electronic glazing.

Acoustic glazing

Purpose-built **acoustic** units combine a laminated pane, unequal glass thicknesses, and an optimized gap to dampen sound. Ask for a tested rating rather than a general claim (Section 12).

Bird-friendly & impact-resistant

Bird-friendly glazing uses patterns or coatings visible to birds to reduce collisions — increasingly required in some jurisdictions for larger buildings. **Impact-resistant** laminated units resist storm debris in high-wind coastal regions.

Common glass packages, decoded

Contractors bundle these features into named “packages.” The label matters less than the components — ask what panes, coating, gas, and spacer the package actually contains, and what the resulting whole-window rating is.

Glass package	What it is	Typical use
Double, Low-E, argon, warm-edge	The mainstream high-performance package for most Canadian homes.	Balanced efficiency at reasonable cost; wide availability.
Triple, two Low-E, argon/krypton	Adds a pane, gap, and coating for lower heat loss and warmer glass.	Cold climates, comfort near glass, quiet — weigh cost vs. benefit (\$10).
Low-SHGC (“solar-control”) Low-E	Coating tuned to block summer solar heat.	West/south exposures, hot rooms, cooling-dominated situations.
High-SHGC (“passive”) Low-E	Coating that admits more free solar heat in winter.	North-facing or heating-dominated windows where winter gain helps.
Laminated (one or both panes)	Bonded interlayer for safety, security, UV, and noise.	Ground-floor security, egress-well windows, noise, safety locations.
Tempered	Heat-strengthened safety glass.	Code-required locations — near doors, floors, tubs, stairs (\$13).
Obscure / frosted	Light without a clear view.	Bathrooms, sidelites, anywhere you want privacy.
Acoustic (laminated + asymmetric)	Engineered to cut sound transmission.	Busy roads, flight paths — ask for a tested rating (\$12).

🕒 QUESTIONS TO ASK ABOUT THE GLASS

- How many panes, and what gas fill — air, argon, or krypton?
- Which Low-E coating, and is it tuned for solar control or passive gain?
- Is the spacer warm-edge, and what is it made of?
- Which openings get tempered or laminated glass, and why?
- What is the whole-window U-factor / Energy Rating with this exact package?

⚠️ “LOW-E” AND “ARGON” ARE NOT A SPEC BY THEMSELVES

Nearly every modern window claims Low-E and argon. Those words don't tell you which coating, how many coatings, the spacer type, or the resulting number. Always bring the conversation back to the certified whole-window U-factor and Energy Rating for the specific configuration — that's the figure you can actually compare between quotes.

Energy-Performance Labels & Ratings

Independent energy labels are the one place you can compare windows on equal, third-party terms. Learn to read the five core numbers and you can cut through most sales language in a single glance.

In North America, the **National Fenestration Rating Council (NFRC)** — an independent non-profit — tests and certifies *whole-product* energy performance so buyers can compare windows fairly.^[3] In Canada, **Natural Resources Canada (NRCan)** administers the **ENERGY STAR** program and adds a Canadian **Energy Rating (ER)** to the label.^[13]

△ TECHNICAL NOTE

“Whole-product” matters. A label rating is an *area-weighted average* of the centre-of-glass, edge-of-glass, and frame performance — not just the best spot in the middle of the glass.^[7] A “centre-of-glass” number always looks better than the real window; insist on the whole-product figure.

→ KEY TAKEAWAY

Compare the **whole-window** U-factor and Energy Rating between quotes, for the *same size and operator type*. Those two numbers, tested the same way for everyone, are the fairest basis for comparison you will get.



A sample (fictional) energy label. Every field is explained on the next page. “World-Class Windows Inc.” and its numbers are invented for illustration.

Every field on the label, explained

Field	What it measures	Typical range	How to read it
U-factor	Rate of heat flow through the whole window — how well it insulates. ^[7]	Usually 1.2 down to about 0.8 W/m ² ·K (≈0.20–0.14 U.S. units).	Lower = better insulation. Most important in cold, heating-dominated climates.
Energy Rating (ER)	Canada's combined score of U-factor, solar gain (SHGC) and air leakage. ^[14]	A unitless number; higher is better.	Higher = better overall. A single figure that balances the trade-offs.
SHGC	Fraction of the sun's heat the window lets in. ^[5]	0 to 1; typically ~0.25–0.55.	Depends on climate & orientation — see the note below. Not “lower is always better.”
Visible transmittance (VT)	How much daylight passes through. ^[6]	0 to 1; higher lets in more light.	Higher = brighter room. Balance against glare and solar heat.
Air leakage (AL)	How much air passes through the assembly. ^[5]	Reported low; ENERGY STAR products meet a tightness limit.	Lower = fewer drafts and less wasted energy.
Condensation resistance (CR)	How well the window resists interior condensation (optional). ^[9]	Scale of 1–100.	Higher = more resistant to fogging in cold weather. Optional on the label.

⚠ “LOWER IS BETTER” IS ONLY HALF TRUE

It's true for U-factor and air leakage. For **SHGC it depends**: a low SHGC helps a hot, sunny, west-facing room but a north-facing window in a cold climate may benefit from a *higher* SHGC that admits free winter heat. Orientation, shading, and climate decide — not a single rule.^[8]

R-value note: Contractors sometimes quote an “R-value” for glass. R-value is simply the inverse of U-factor and is *not* part of the official energy standard for windows; NRCan notes it is often cited by sales staff but isn't the certified metric.^[19] Compare U-factor or ER instead.

⚙ TECHNICAL NOTE

Canada now uses **one national ENERGY STAR standard**. Since January 2020 the old climate zones were merged: a residential window qualifies if it has a U-factor of 1.22 W/m²·K or lower, *or* an Energy Rating of 34 or higher; the “Most Efficient” tier requires roughly $U \leq 1.05$ or $ER \geq 40$.^[13,14]

🗯 QUESTIONS TO ASK ABOUT RATINGS

- Is this exact model NFRC-certified, and can I see its listing?
- Is it ENERGY STAR certified in Canada — standard or “Most Efficient”?
- What's the whole-window U-factor and ER for the size and operator I'm buying?
- Which SHGC did you choose for each exposure, and why?

Verify any certified product yourself: NRCan and NFRC both publish searchable directories of tested models.^[3,14] Local energy codes and rebate programs may set their own minimum ratings — confirm current requirements locally.

Comfort, Condensation & Indoor Humidity

New windows are blamed for condensation more than almost anything else — often unfairly. Understanding why moisture forms on glass tells you whether you have a window problem, a humidity problem, or a warning sign of something bigger.

Why condensation forms

Air holds a limited amount of moisture, and less when it's cold. When warm, humid indoor air touches a cold surface, it cools below its **dew point** and the moisture condenses into water.^[5] Glass is usually the coldest indoor surface, so it's where you notice it first.

Four things interact: **indoor humidity**, **outdoor temperature**, the **temperature of the glass surface**, and **airflow** across it. Raise the humidity, drop the outdoor temperature, or block airflow with heavy curtains, and condensation gets more likely.

△ TECHNICAL NOTE

Interior condensation (on the room side of the glass) is about your indoor air, not a broken window. A better window has a warmer inside surface — thanks to Low-E, gas fill, and warm-edge spacers — so it resists condensation longer, but none eliminates it if indoor humidity is high enough.

New windows can make it more visible

A tighter, more efficient window seals your home better — but that means humidity that used to leak out through drafty old windows now stays inside. Some homeowners see *more* condensation after an upgrade until they lower indoor humidity or improve ventilation.

△ FOG BETWEEN THE PANES IS DIFFERENT

Condensation you can wipe off the room-side glass is a humidity issue. Moisture *sealed between* the panes that you cannot wipe from either side means the glass unit's seal has failed and it has lost performance.^[8] That's a product problem (often a glass-unit replacement), not a humidity one.

Condensation vs. a leak

Surface condensation appears as an even film or droplets across cold glass, worst in the coldest weather, and wipes away. A **leak** shows up as water tracking from a specific point, staining, or wet trim — often tied to rain rather than cold. If water appears after rain, suspect flashing, sealant, or drainage (Section 15), not humidity.

→ KEY TAKEAWAY

Persistent condensation on many windows usually points to **high indoor humidity**, not defective windows. Address humidity first: ventilation, exhaust fans, humidifier settings, and airflow. Moisture that also causes musty smells, staining, or mould may signal a larger building-envelope problem worth investigating.

Moisture diagnostic chart

Match what you see to the likely cause before spending money. Two of the five patterns below are not window problems at all.

What you observe	Most likely diagnosis	Underlying cause	What to do
Even film on room-side glass, worst in cold snaps, wipes off	Interior surface condensation	High indoor humidity + cold glass	Lower humidity; improve airflow & ventilation; consider warmer glazing
Haze/droplets sealed between the panes, won't wipe from either side	IGU seal failure	Failed edge seal, saturated desiccant	Replace the glass unit (or sash); frame may be fine
Dew on the OUTSIDE glass on a cool morning	Exterior condensation	A well-insulating window keeping the outer pane cold	None needed — often a sign the window insulates well
Water tracking from a point, staining, wet trim, tied to rain	Leak / water intrusion	Flashing, sealant, or drainage failure	Investigate installation & water management (\$15)
Condensation plus musty smell, mould, or damp walls	Possible envelope issue	Excess moisture in the building	Investigate ventilation & the wall assembly; get a professional assessment

🕒 QUESTIONS THAT SORT HUMIDITY FROM DEFECTS

- Is the moisture on the room side, sealed between the panes, or on the exterior?
- Does it appear in cold weather (humidity) or after rain (water intrusion)?
- What is our indoor relative humidity in winter, and what should it be?
- If it's between the panes, can just the glass unit be replaced?

Noise Reduction

Windows are often the weakest link for outside noise — but they're rarely the only one. Here's what actually reduces sound through glass, and why a new window may quiet a room without silencing it.

What actually reduces sound

- **Mass.** Thicker, heavier glass resists sound better. A laminated pane adds both mass and a damping interlayer.
- **Laminated glass.** The plastic interlayer absorbs vibration and is one of the most effective single upgrades for noise.
- **Unequal glass thicknesses.** Two panes of *different* thickness dampen a wider range of frequencies than two identical panes, which can resonate together.
- **Airspace.** A wider gap between panes generally helps low-frequency noise; the gap size is a design trade-off with thermal performance.
- **Frame & installation quality.** A tightly sealed, well-installed window blocks the air paths that let sound leak around the glass.

△ TECHNICAL NOTE

Sound reduction is measured by tested ratings such as STC (Sound Transmission Class) or the outdoor-focused OITC. A higher number means more reduction. Insist on a *tested* rating for the specific unit rather than a general “soundproof” claim.

△ NEW WINDOWS RARELY ELIMINATE NOISE

Sound also travels through walls, roofs, vents, doors, chimneys, and any gap. If a wall or an old door is the weak point, even the best acoustic window won't make the room quiet. Treat noise as a whole-room problem and fix the weakest paths first.

Set realistic expectations

Upgrading from single glazing to a well-sealed laminated unit can make a clear, noticeable difference. Going from a decent double unit to a specialized acoustic unit is a smaller, more selective improvement. Manufacturers who publish tested ratings can tell you roughly what to expect; be skeptical of specific decibel promises that aren't backed by test data.

🕒 QUESTIONS TO ASK ABOUT NOISE

- What is the tested STC/OITC rating of this specific unit?
- Does the acoustic option use laminated glass and unequal pane thicknesses?
- How will the installation seal air gaps around the frame?
- Which noise are we targeting — traffic (low frequency) or voices/aircraft (higher)?

→ KEY TAKEAWAY

For noise, the reliable levers are **laminated glass, unequal pane thicknesses, and airtight installation**. Ask for a tested STC/OITC rating, and remember the window is only as quiet as the weakest sound path in the whole room.

Security & Safety

Windows carry two jobs that pull in opposite directions: keeping intruders out, and letting people get out fast in an emergency. Both are partly governed by code — which you must verify locally.

Security features

- **Locking systems.** Multi-point locks pull the sash tight at several points; a single central latch is easier to force.
- **Reinforced frames.** Stronger frames and hardware resist prying.
- **Laminated glass.** Holds together when struck, slowing forced entry — useful on accessible ground-floor windows.
- **Tempered glass.** Breaks safely into blunt pieces; required in certain locations (right).

Child safety

- **Opening restrictors / limiters** cap how far a window opens to prevent falls, while still allowing a quick full release for escape.
- **Fall hazards.** Windows above ground level near floors are a known risk; guards and restrictors help, but must not block emergency escape.
- **Cordless coverings.** Pair safe windows with cordless blinds to remove strangulation hazards.

△ TECHNICAL NOTE Safety-glazing locations.

Building codes require stronger “safety glazing” (usually tempered or laminated) where people could fall into glass — for example glass in and beside doors, near the floor, and around tubs, showers, and stairs. The exact locations and thresholds are set by your local code; confirm which of your openings qualify.

△ EGRESS AND SECURITY MUST COEXIST

A window that's hard to break into must still open easily from the inside for escape. Never fit locks, bars, restrictors, or well covers that need tools, keys, or special knowledge to open on a required emergency-escape window.

Balcony & high-rise

Above-grade and high-rise openings have their own guard-height and opening-limit rules, and condominiums add their own. Verify both the building code and the condo declaration before changing any opening.

Emergency escape (egress) windows

An **egress window** is one a person can climb out of — or a firefighter can climb in through — in an emergency. Codes generally require that any floor level with a bedroom has at least one compliant escape route, and below-grade bedrooms almost always need a properly sized egress window unless a door provides direct exit to the outside.

⚠ WORKED EXAMPLE — ONTARIO BUILDING CODE

The requirements vary by jurisdiction, but Ontario's rules make a useful, concrete example. Under Section 9.9.10 of the 2024 Ontario Building Code (mandatory since spring 2025), a required bedroom egress window must:^[16]

- Open from the inside **without tools, keys, or special knowledge**.
- Provide an unobstructed opening of at least **0.35 m² (3.77 sq ft)**, with **no dimension less than 380 mm (15")**.^[16]
- Stay open without needing to be held.
- Where it opens into a window well, provide at least **550 mm (about 22")** of clearance in front of the window.^[16]

⚠ A 380 × 380 MM WINDOW DOES NOT PASS

Because 380 mm × 380 mm gives only about 0.14 m² — well under the 0.35 m² area rule — at least one dimension must be larger than the 380 mm minimum to reach the required *area*.^[16] The openable portion is what counts, so on a slider or hung window only the part that actually opens qualifies.

→ KEY TAKEAWAY

If any bedroom — especially a basement bedroom or a legal secondary suite — is part of your project, confirm egress *before* choosing the window style and size. Getting it wrong can fail inspection, void a rental permit, or collapse a future home sale. Your numbers may differ from Ontario's: verify with your local building department.

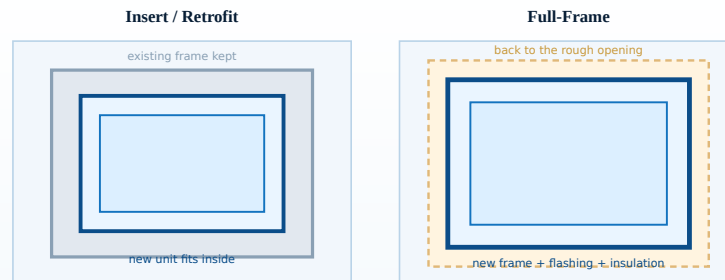
🕒 QUESTIONS TO ASK ABOUT EGRESS

- Which of my openings are required egress windows under local code?
- Does the openable size of the proposed unit meet the clear-opening rule?
- For basement wells, is clearance, drainage, and a ladder (if deep) included?
- Will you handle permit drawings and the inspection?

The figures above are Ontario-specific and current at the time of writing. Egress dimensions, sill heights, and window-well rules differ across provinces, states, and municipalities and change over time — **always verify with your authority having jurisdiction**.

Insert, Retrofit & Full-Frame Installation

This single choice affects price, disruption, how your windows look, and — most importantly — which problems actually get fixed. It should be decided by inspecting your existing frames, never by a default sales package.



Left: an **insert** fits a new window inside the existing frame, which stays in place. Right: **full-frame** removes everything back to the rough opening so the frame, flashing, and insulation can be renewed.

Insert / retrofit installation

What stays: the existing frame, exterior cladding, and usually the interior and exterior trim.

What's removed: only the old sashes and hardware.

What goes in: a new, slightly smaller complete window set into the old frame.

When it may suit: the existing frame is sound, square, and dry, and you want to preserve interior/exterior finishes with less mess, time, and cost.

Trade-offs: because the new unit sits inside the old frame, you lose a little **glass area**. Crucially, it *does not address hidden problems* in the old frame or the seal to the wall — if there's rot or a failed air/water seal behind the trim, an insert can seal it in.

Full-frame installation

What stays: the rough opening in the wall.

What's removed: the entire old window *and* its frame, back to the framing.

What goes in: a complete new frame and window, with fresh flashing, insulation, air sealing, and new interior/exterior finishing.

When it may suit: the old frame is rotted, out of square, or of unknown condition; you want to correct the opening, maximize glass area, or renew the water management around the window.

Trade-offs: more labour, more finishing (interior trim and exterior capping), more disruption, and higher cost — in exchange for the ability to fix what an insert would hide.

Insert vs. full-frame — side by side

Consideration	Insert / retrofit	Full-frame
What is removed	Old sashes & hardware only	Entire window and frame, to the rough opening
Existing frame	Kept in place	Removed and replaced
Visible glass area	Slightly reduced	Maximized (can be larger than before)
Hidden frame/rot issues	Not addressed — can be concealed	Exposed and corrected
Flashing & water management	Generally not renewed	Renewed as part of the job
Insulation / air seal at opening	Limited access	Fully re-done
Interior & exterior finishing	Usually preserved	New trim and capping required
Disruption & time	Lower	Higher
Relative labour & cost	Lower	Higher

⚠ THE BIGGEST WARNING SIGN IN THIS WHOLE GUIDE

Be very cautious of any installer who recommends insert *or* full-frame **before inspecting your existing frames**. The right method depends on the hidden condition of the old frame and the seal to the wall. A method chosen to fit a sales package — rather than your actual opening — is how homeowners end up sealing rot inside a wall or paying for full-frame work they didn't need. Ask them to show you the condition of the frame that justifies their recommendation.

🕒 QUESTIONS TO ASK ABOUT INSTALLATION METHOD

- Did you inspect the existing frames, and what condition are they in?
- Why is this method right for *this* opening specifically?
- With an insert, how much glass area will I lose?
- With an insert, how do you confirm there's no hidden rot or failed seal behind the trim?
- With full-frame, is new flashing, insulation, air sealing, trim, and capping all included?
- What will you do if you open the wall and find unexpected damage — and how is that priced?

→ KEY TAKEAWAY

Neither method is universally better. Insert preserves finishes and reduces cost and mess when the old frame is genuinely sound. Full-frame costs more but lets an installer correct a damaged opening and renew the water management. The deciding factor is the *inspected condition of your existing frames* — insist that inspection happens first.

What Proper Installation Should Include

A premium window installed badly performs worse than a modest window installed well. Installation is where much of the real-world energy, comfort, and durability is won or lost — and it's largely hidden once the trim goes on.

- 1 **Opening inspection.** Check the rough opening and existing frame for rot, out-of-square framing, and prior water damage before anything goes in.
- 2 **Careful removal.** Remove old units without damaging the surrounding wall, siding, or interior finishes.
- 3 **Substrate & sill repair.** Repair any damaged framing or sheathing and prepare a sound, dry sill — the most water-exposed part of the opening.
- 4 **Level, square & plumb.** Set the window true in all planes so it operates smoothly and seals evenly. A racked install never seals well.
- 5 **Fastening & shimming.** Fasten per the manufacturer's instructions and shim at the correct points so the frame isn't bowed or pinched.
- 6 **Insulation.** Fill the gap between frame and opening with low-expansion foam or backer rod — enough to stop drafts without bowing the frame.
- 7 **Interior air sealing.** Create a continuous air barrier on the warm side to stop indoor air (and its moisture) reaching the cold gap.
- 8 **Exterior water management.** Integrate flashing and sealant so any water that reaches the opening is directed *out* and down, not into the wall.
- 9 **Flashing & drainage.** Lap flashing correctly with the wall's water-resistive barrier and keep weep/drainage paths clear.
- 10 **Exterior capping & sealant.** Finish and seal the exterior neatly, with sealant joints that shed water and allow drainage.
- 11 **Interior trim.** Reinstall or replace interior casing for a clean, finished look.
- 12 **Cleanup & testing.** Remove debris and test every window: smooth operation, locks engaging, screens fitting, no drafts.

→ KEY TAKEAWAY

The order matters as much as the parts: inspect and repair the opening first, set the window true, then build the **water management from the outside in** and the **air seal from the inside out**. Ask an installer to describe this sequence — a good one can, without hesitation.

Four seals that get confused — and why it matters

Contractors and homeowners often lump these together as “caulking.” They do different jobs, and a quote that only mentions caulking may be missing the ones that matter most.

Element	What it does	Why it matters
Cosmetic caulking	Fills visible gaps for a tidy look.	Appearance only — it is not, by itself, weatherproofing or insulation.
Air sealing	Stops air (and the moisture it carries) moving through the gap around the frame.	Comfort and efficiency; prevents condensation in the wall cavity.
Water sealing / flashing	Directs liquid water out and away from the opening.	Prevents leaks, rot, and hidden water damage — the costliest failures.
Insulation	Fills the frame-to-opening gap to slow heat transfer.	Eliminates a cold, drafty perimeter around every window.

⚠ “WE’LL CAULK AROUND IT” IS NOT AN INSTALLATION SPEC

Exterior caulk alone is not flashing, not an air seal, and not insulation. Water that gets past caulk with no flashing behind it has nowhere to drain and ends up in the wall. Ask specifically how *water* is managed (flashing and drainage), how *air* is sealed (interior barrier), and how the gap is *insulated* — three separate answers, not one.

🕒 QUESTIONS TO ASK ABOUT INSTALLATION QUALITY

- How will you inspect and repair the opening before installing?
- How is the window flashed and integrated with the wall's water barrier?
- How do you air-seal the interior and insulate the frame-to-opening gap?
- How are drainage/weep paths kept clear?
- Will you test operation, locks, and screens on every window before final payment?
- Do you install to the window manufacturer's instructions (which the warranty may require)?

📌 TECHNICAL NOTE

Manufacturer warranties frequently require installation to follow the maker's written instructions. Poor installation is one of the most common warranty *exclusions* (Section 22) — another reason installation quality protects both performance and coverage.

How Window Prices Are Built

There is no honest universal price per window — a quote is built from many components, and the same window can cost very different amounts depending on your home. Understanding the parts lets you see what you're paying for and why two quotes differ.

⚠ WHY THIS GUIDE WON'T QUOTE YOU A PRICE RANGE

Any “windows cost \$X each” figure is misleading without your sizes, styles, materials, glass, access, and installation scope. A basement slider and a second-floor custom bay are both “a window.” Instead of a fake range, learn the cost drivers below and make contractors show you how their number is built.

The components that build a price

THE WINDOW ITSELF

- **Size.** Bigger units use more material and are harder to handle.
- **Style / operator.** Casement, tilt-and-turn, and projecting styles cost more than fixed or single-hung.
- **Frame material.** Vinyl, fibreglass, aluminum, wood, clad, and composite sit at different price points.
- **Glass package.** Panes, coatings, gas, spacer, and safety glass all add cost.
- **Safety glass.** Tempered or laminated glass where required or chosen.
- **Colour / finish.** Non-standard and dual colours often carry an upcharge.
- **Grids.** Between-glass or applied grids add cost.
- **Hardware.** Upgraded locks, operators, and finishes.
- **Custom shapes.** Arches and geometry mean custom tooling and longer lead times.

THE INSTALLATION & SITE

- **Removal difficulty.** Old frames that fight removal add labour.
- **Access.** Tight, high, or awkward openings slow the crew.
- **Floor level.** Upper floors may need lifts, scaffolding, or extra crew.
- **Full-frame vs. insert.** Full-frame adds labour and finishing.
- **Interior trim.** New casing and finishing after full-frame work.
- **Exterior capping.** Aluminum capping and exterior finishing.
- **Structural repairs.** Rot, rough-opening changes, or new lintels for enlarged/egress openings.
- **Permits.** Where required, permit fees and drawings.
- **Disposal.** Hauling and disposing of old units.

BUSINESS & MARKET FACTORS

- **Travel.** Distance to your site.
- **Minimum charges.** A single-window job often carries a minimum.
- **Seasonal demand.** Peak-season pricing vs. slower periods.
- **Warranty coverage.** Longer or labour-inclusive warranties may cost more up front.

→ KEY TAKEAWAY

Price differences between quotes usually come from *scope and specification*, not just markup. A cheaper quote may omit flashing, disposal, trim, permits, or use a lower glass package. The next two sections make those differences visible.

“What is included in this price?” — a checklist

Run every quote through this list. Anything not clearly included is either an assumption or a future extra charge. Tick each item the quote actually covers in writing.

- | | |
|---|--|
| ☐ The exact windows (make, series, size, style, colour) for each opening | ☐ Exterior capping / finishing |
| ☐ The specified glass package and any safety glass | ☐ Screens and hardware included |
| ☐ Installation method stated (insert or full-frame) | ☐ Permits — who applies and who pays |
| ☐ Removal of the old windows | ☐ Any structural or rough-opening work identified |
| ☐ Disposal and haul-away of old units and debris | ☐ Taxes shown separately |
| ☐ Flashing and water-management details | ☐ Cleanup of the work area |
| ☐ Interior air sealing and frame insulation | ☐ Product warranty and labour warranty terms |
| ☐ Interior trim / casing finishing | ☐ Timeline, deposit, and payment schedule |

⚠ THE CHEAPEST QUOTE IS OFTEN THE LEAST COMPLETE

A low number frequently means fewer things are included — no disposal, no flashing detail, a lighter glass package, or permits left to you. Before comparing prices, make every quote cover the same items using this checklist and the scope template in Section 17.

How to Request Comparable Quotes

The single most valuable move in this whole guide: give every contractor the *same* written scope. When everyone quotes identical work, their prices finally mean something — and vague quotes reveal themselves instantly.

Copy the template below into an email or hand it to each contractor. Ask them to price **this exact scope**, and to note in writing anything they would change and why. You'll get comparable numbers *and* a sense of who reads carefully.

→ KEY TAKEAWAY

Send the identical scope to **three to five** contractors. Fewer than three gives you no real comparison; more than five is hard to manage well. Put everything in writing so verbal “extras” can't appear later.

Quote-request template

Subject: Request for quote — window replacement (please price the scope below)

Please quote the following scope exactly as written so I can compare quotes fairly. If you recommend a change, please note it separately with the reason. Please provide the quote in writing.

- 1 **Window schedule:** A numbered list of every opening, with room, current style, and rough size. (Use the inventory sheet in Section 29.)
- 2 **Product specifications:** Manufacturer, product series, frame material, and glass package for each window.
- 3 **Performance target:** The whole-window U-factor / Energy Rating you expect, and any ENERGY STAR requirement.
- 4 **Installation method:** Insert or full-frame — and confirmation you've inspected the frames to justify it.
- 5 **Removal:** Removal of all existing windows.
- 6 **Disposal:** Haul-away and disposal of old units and debris.
- 7 **Interior finishing:** Interior trim / casing work included.
- 8 **Exterior finishing:** Exterior capping and finishing included.
- 9 **Sealants:** Exterior sealant joints specified.
- 10 **Flashing:** Flashing and water-management method.
- 11 **Insulation & air sealing:** Frame-to-opening insulation and interior air seal.

Quote-request template — continued

- 1 **Hardware:** Locks, operators, and finishes included.
- 2 **Screens:** Screens included for operable windows.
- 3 **Safety / egress glass:** Which openings get tempered/laminated glass or must meet egress.
- 4 **Permits:** Whether a permit is needed, who applies, and who pays.
- 5 **Taxes:** All applicable taxes shown separately.
- 6 **Lead time:** Estimated order-to-installation timeline.
- 7 **Payment schedule:** Deposit amount and payment milestones.
- 8 **Warranty:** Product warranty and labour/installation warranty terms.
- 9 **Cleanup:** Cleanup of the work area on completion.
- 10 **Change-order rules:** How unexpected conditions (e.g. hidden rot) are priced and approved.

🕒 ASK EACH CONTRACTOR

- Can you provide the quote itemized, in writing, matching this scope?
- Which items, if any, would you change — and why?
- Is anything in my scope *not* included in your price?
- What's your written change-order process if you find hidden damage?

⚠️ WATCH WHO IGNORES THE SCOPE

A contractor who returns a one-line price with no reference to your itemized scope is telling you something. So is one who won't itemize, or who substitutes their own package without explanation. The way a contractor responds to a clear scope is a preview of how they'll handle your project.

→ KEY TAKEAWAY

Keep every quote, email, and note in one folder. This paper trail is what lets the comparison worksheet in Section 18 work — and what protects you if promises and the final contract don't match.

How to Compare Quotes

Now that every contractor priced the same scope, lay them side by side. Fill this worksheet in for three to five contractors, compare rows rather than bottom lines, and let total value — not the lowest number — guide you.

Print these pages and enter each contractor's answers. Where a quote is silent on a row, write “not stated” — those blanks are exactly where hidden costs hide. Compare **row by row**, not total by total, and score each contractor at the end (Section 29, M6).

Quote-comparison worksheet — product & specification

Comparison field	Contractor A	Contractor B	Contractor C	Contractor D
Company & product				
Contractor / company name				
Manufacturer				
Product series / line				
NFRC / ENERGY STAR certified?				
Frame material				
Window style(s)				
Colour / finish				
Glass & performance				
Glass package (panes / coating / gas)				
Spacer type (warm-edge?)				
Whole-window U-factor				
SHGC				
Energy Rating (ER)				
Safety glass where required (temp/lam)				

Tip: for U-factor, SHGC and ER, make sure the figures are for the *same size and operator type* so they're truly comparable (Section 10).

Quote-comparison worksheet — installation & scope

Comparison field	Contractor A	Contractor B	Contractor C	Contractor D
Installation & finishing				
Installation method (insert / full-frame)				
Frames inspected before quoting?				
Flashing / water-management method				
Interior air seal & insulation				
Interior trim included				
Exterior capping included				
Screens & hardware included				
Responsibilities				
Removal & disposal included				
Permit — who applies / pays				
Structural repairs identified				
Cleanup included				
Change-order process in writing				

Quote-comparison worksheet — price, terms & score

Comparison field	Contractor A	Contractor B	Contractor C	Contractor D
Price & terms				
Subtotal (before tax)				
Taxes				
Total price				
Deposit required				
Payment milestones				
Estimated timeline				
Warranty & commitments				
Product warranty (years / terms)				
Labour / installation warranty				
Key exclusions noted				
Sales promises put in writing?				
Assessment				
Overall value score (/10)				
Notes / red flags				

⚠ AN OUTLIER LOW PRICE IS A QUESTION, NOT A BARGAIN

If one quote is dramatically lower, don't assume you found a deal — assume something differs. Re-check its rows against the others: lighter glass, no flashing, no disposal, a shorter warranty, or work left off. Ask the contractor to explain the gap before you trust it.

→ KEY TAKEAWAY

The “best” quote is the one with the strongest combination of specification, installation quality, warranty, and inclusions at a price you can justify — captured in the value score, not the total alone. Take that score to the final decision scorecard (Section 29, M7).

Contractor Screening

The window matters, but the company installing it — and standing behind it years from now — matters just as much. Verify who you're dealing with before a deposit changes hands.

What to verify before you sign

- ✓ **Legal business identity**
A registered business name and number you can look up, not just a phone number and a truck.
- ✓ **Insurance**
Current liability insurance — ask for a certificate naming the coverage and dates.
- ✓ **Licensing (where applicable)**
Any trade or contractor licence your jurisdiction requires. Confirm what's required locally.
- ✓ **Workers' compensation (where applicable)**
Coverage for the crew, so you're not exposed if someone is hurt on your property.
- ✓ **Physical address**
A real business address, not only a P.O. box or mobile number.
- ✓ **Years in operation**
How long under the current business name — useful context for a long warranty.
- ✓ **Who installs**
Whether the company's own crews or subcontractors do the work.
- ✓ **Subcontracting practices**
If subcontracted, who's responsible for quality and warranty.
- ✓ **References**
Recent local customers with similar projects you can actually contact.
- ✓ **Complaint patterns**
Check consumer-protection and business-standards bodies for unresolved complaints.
- ✓ **Reviews**
Read across several platforms; look for how they handle problems, not just star counts.
- ✓ **Manufacturer authorization**
Whether they're an authorized dealer/installer for the product (can affect warranty).
- ✓ **Warranty responsibility**
Who honours the labour warranty if the company changes or closes.
- ✓ **Written scope**
A detailed written scope and contract — never a verbal agreement.
- ✓ **Change-order process**
How surprises are documented, priced, and approved.
- ✓ **Cleanup & damage responsibility**
Who's responsible for protecting your home and cleaning up.

→ KEY TAKEAWAY

Two verifications protect you most: **insurance** (so an injury or damage on your property isn't your problem) and **who honours the labour warranty** (so a problem in year three has a clear owner). Get both in writing.

Contractor interview — 28 questions

Work through these on a call or visit. You're assessing not just the answers but how openly they answer. Print the full sheet in Section 29 (M5).

- | | |
|--|---|
| 1 How long have you operated under this business name? | 1 What's included in your price, and what's excluded? |
| 2 Are you insured, and can you provide a current certificate? | 2 Is removal, disposal, trim, capping, and cleanup included? |
| 3 Do you carry workers' compensation coverage for your crew? | 3 Who pulls the permit, and is the fee in your price? |
| 4 What licences or registrations do you hold for this work? | 4 What's your written change-order process for hidden damage? |
| 5 Do your own employees install, or do you subcontract? | 5 What deposit do you require, and what are the payment milestones? |
| 6 If subcontracted, who is responsible for quality and warranty? | 6 What is your product warranty, and what does it exclude? |
| 7 Are you an authorized dealer/installer for this product line? | 7 What is your labour/installation warranty, and how long? |
| 8 Can you share three recent local references with similar projects? | 8 Who honours the labour warranty if your business changes hands? |
| 9 Will you inspect my existing frames before recommending a method? | 9 How do you protect interior finishes, floors, and landscaping? |
| 10 Which installation method do you recommend for my home, and why? | 10 What is your estimated timeline from order to completion? |
| 11 What exact product, series, and glass package are you proposing? | 11 How do you handle deficiencies found at final inspection? |
| 12 What whole-window U-factor and Energy Rating will I get? | 12 Will you put every promise made today into the written contract? |
| 13 How do you flash and water-seal each window? | 13 How do you handle disputes if we disagree about the work? |
| 14 How do you air-seal and insulate the frame-to-opening gap? | 14 Can I hold final payment until deficiencies are corrected? |

△ HOW THEY ANSWER IS THE REAL TEST

A trustworthy contractor answers these plainly and puts the answers in writing. Evasiveness, irritation at reasonable questions, or pressure to skip the paperwork and “just trust me” are themselves the answer.

Sales Tactics & Warning Signs

Most window sellers are straightforward. But a handful of high-pressure tactics show up again and again in this industry. Recognizing them keeps you calm, in control, and out of a bad contract.

Pressure & pricing tactics

WATCH FOR

“Today only” pricing. A discount that vanishes if you don't sign on the spot.

Your move: A fair price is still fair next week. Legitimate quotes are typically valid for a reasonable period so you can compare.

WATCH FOR

Artificial or inflated discounts. A huge “50% off” from a list price no one pays.

Your move: Judge the final number against other quotes, not against an invented original price.

WATCH FOR

Inflated starting prices. A high opening number designed to be “negotiated down” to a target.

Your move: Comparable written quotes make the real market price obvious.

WATCH FOR

Pressure to sign immediately. Insisting the decision happen during the visit.

Your move: A good contractor expects you to think it over and compare.

WATCH FOR

Large deposits without justification. Demanding most of the price up front.

Your move: Deposits should be reasonable and tied to ordering materials — confirm what's normal in your area.

WATCH FOR

Cash-only demands. Pushing for cash to avoid a paper trail.

Your move: Insist on a written contract and a traceable payment method.

WATCH FOR

Pressure to finance. Steering you into financing whose true cost isn't clear.

Your move: Understand the total cost of any financing, or arrange your own.

Transparency & scope warning signs

WARNING SIGN

Refusal to provide specifications. Won't name the exact product, series, glass, or ratings.

Your move: You can't compare or verify what you can't see. Insist on specifics in writing.

WARNING SIGN

Vague product descriptions. "Top-quality energy-efficient windows" with no model or numbers.

Your move: Ask for the model and the certified U-factor / ER.

WARNING SIGN

No written warranty. Verbal assurances but nothing on paper.

Your move: If it's not written, it doesn't exist. Get product and labour warranties in the contract.

WARNING SIGN

No installation details. Silence on flashing, air sealing, and method.

Your move: Installation is where performance is won or lost (Section 15). Get the method in writing.

WARNING SIGN

Unclear subcontracting. Won't say who actually installs.

Your move: Know who's on your property and who owns the warranty.

WARNING SIGN

Verbal-only promises. Key commitments made aloud but left out of the contract.

Your move: Every promise goes in the written contract before you sign (Section 21).

WARNING SIGN

Unusually low quotes. A price far below the others.

Your move: Usually means a lighter scope or spec. Compare row by row (Section 18).

WARNING SIGN

Misleading energy-savings claims. Specific savings or payback figures presented as guarantees.

Your move: Be skeptical of precise savings promises; real results depend on your home and habits.

WARNING SIGN

"Every window must be replaced". A blanket verdict after a brief look.

Your move: Ask for the specific failure on each window; some may only need repair (Section 5).

WARNING SIGN

Refusal to itemize. Only a single lump sum, no breakdown.

Your move: An itemized quote is standard. A refusal to itemize hides the details.

→ KEY TAKEAWAY

Stay balanced. A promotion, a subcontractor, or financing isn't automatically bad — plenty of reputable companies use all three. The warning sign is **pressure plus a lack of written specifics**. When those two appear together, slow down and ask for it in writing.

Contract Review

The contract is the only version of your project that counts. Before you sign, confirm that every product, promise, date, and dollar is written into it. If a good verbal point isn't in the contract, treat it as not agreed.

Contract-review checklist

Walk the contract against this list. Anything missing is either an oversight to fix now or a gap that will cost you later.

PARTIES & PRODUCT

- ☐ Your name and the property address
- ☐ The contractor's legal name, address, and business number
- ☐ Product manufacturer, series, and model for each window
- ☐ Quantities and each opening identified
- ☐ Exact sizes for each unit
- ☐ Colours / finishes (interior and exterior)
- ☐ Glass options and any safety/egress glass by opening

WORK & SCHEDULE

- ☐ Installation method (insert or full-frame)
- ☐ Interior and exterior finishing included
- ☐ Flashing, air sealing, and insulation specified
- ☐ Start date and completion date
- ☐ What happens if there are delays
- ☐ Permit responsibility (who applies, who pays)
- ☐ Change-order process and how extras are approved

Contract-review checklist — continued

MONEY

- ☐ Total price with taxes shown
- ☐ Deposit amount
- ☐ Payment terms and milestones
- ☐ Financing terms and total cost (if any)
- ☐ Cancellation / cooling-off rights (verify local law)

PROTECTION & SIGN-OFF

- ☐ Damage responsibility and property protection
- ☐ Cleanup obligations
- ☐ Product warranty terms
- ☐ Labour / installation warranty terms
- ☐ Dispute-resolution process
- ☐ All verbal promises written in
- ☐ Signatures and dates from both parties
- ☐ All attachments (quote, specs, drawings) referenced

🕒 QUESTIONS BEFORE SIGNING

- Is every promise from our conversations written in this contract?
- Are product model, ratings, and sizes specified per opening?
- What exactly triggers each payment — especially the final one?
- How are change orders priced and approved?
- Do I have a cancellation right here, and how do I exercise it?

⚠️ “WE’LL TAKE CARE OF THAT” BELONGS IN THE CONTRACT

Every reassurance a salesperson gives — the extra trim, the disposal, the timeline, the warranty length — must appear in the written contract; once you sign, verbal promises are extremely hard to enforce. Note too that many jurisdictions give a short cancellation or “cooling-off” period for contracts signed at home — confirm your current local consumer-protection rights before signing.

Understanding Warranties

“Lifetime warranty” sounds absolute and rarely is. A warranty is a specific promise with specific limits — learn the parts, the exclusions, and the fine print before you let it sway your decision.

The parts of a window warranty

Warranty type	What it covers	What to check
Product warranty	Covers defects in the window itself.	Ask what's covered and for how long — terms vary widely by part.
Glass / seal-failure warranty	Covers the sealed unit fogging from a failed seal.	Often the most-used coverage; note its length and whether it's prorated.
Hardware warranty	Covers locks, operators, and balances.	Frequently shorter than the glass or frame coverage.
Finish warranty	Covers the frame's colour/finish against fading or peeling.	Coastal or high-humidity exposure is sometimes excluded.
Labour / installation warranty	Covers the contractor's workmanship.	Separate from the product warranty — and only as good as the company behind it.

The fine print that decides its value

- **Transferability.** Does coverage pass to the next owner, and how? A transferable warranty can help at resale.
- **Proration.** Does coverage shrink over time (you pay a growing share), or stay full for the term?
- **Registration.** Must you register within a set window to activate full coverage? Miss it and coverage may drop.
- **Service-call charges.** Are trip and diagnostic fees your responsibility even under warranty?
- **Shipping & labour exclusions.** Is the part free but the labour and freight to fix it not?

⚠️ “LIFETIME” RARELY MEANS FOREVER, FOR EVERYTHING

A “lifetime” warranty may mean the maker's defined product lifetime, may apply only to the original owner, may cover only certain parts, and is often *prorated* so its real value falls each year. Read the definition of “lifetime,” what it covers, and what you'd actually pay for a claim in year ten.

△ TECHNICAL NOTE

A product warranty and a labour warranty are different promises. The maker covers the part; the installer covers the work. A foggy pane may be a free part under the product warranty while the labour to swap it is only covered if the installer offers a labour warranty — and is still in business.

Common exclusions & a comparison worksheet

Warranties are defined as much by what they *exclude* as what they cover. Watch for these common carve-outs:

- ☐ Improper or non-manufacturer-spec installation
- ☐ Normal wear and tear
- ☐ Damage from building settlement or structural movement
- ☐ Coastal / salt-air or high-humidity exposure
- ☐ Condensation caused by indoor humidity
- ☐ Accidental or impact damage
- ☐ Modifications or aftermarket films/coatings
- ☐ Failure to register within the required period
- ☐ Service-call, shipping, and labour charges
- ☐ Cosmetic issues after a set number of days
- ☐ Commercial use of a residential product
- ☐ Damage from improper cleaning products

Warranty-comparison worksheet

Fill this in for each contractor’s offering (full printable version in Section 29, M-Warranty).

Warranty element	Contractor A	Contractor B	Contractor C
Glass / seal-failure — length			
Glass — prorated or full?			
Frame / product — length			
Hardware — length			
Finish — length			
Labour / installation — length			
Transferable to next owner?			
Registration required / deadline			
Service-call fees under warranty?			
Key exclusions			

→ KEY TAKEAWAY

Weigh a warranty by **coverage length × what's actually covered × how easy it is to claim** — not by the word “lifetime.” A shorter, non-prorated, transferable warranty with no service-call fees can be worth more than a longer, heavily-excluded one.

Preparing for Installation Day

A little preparation protects your belongings, speeds up the crew, and prevents the small frustrations that sour an otherwise good project. Use this checklist a day or two before installation.

INSIDE THE HOME

- ☐ Move furniture at least a couple of metres from every window
- ☐ Take down curtains, blinds, and hardware
- ☐ Remove wall décor near the openings
- ☐ Protect valuables and electronics; expect some dust
- ☐ Clear a path from the entry to each work area
- ☐ Note and disarm/adjust any window alarm sensors

PEOPLE & PETS

- ☐ Plan to keep pets secured in a separate, quiet room
- ☐ Arrange supervision for young children away from the work
- ☐ Decide who will be home to answer questions and approve any changes
- ☐ Agree how the crew will reach you during the day

Preparation checklist — continued

ACCESS & OUTSIDE

- ☐ Clear driveway/parking for the crew and their vehicles
- ☐ Book the elevator and loading area (condo/apartment)
- ☐ Confirm condominium rules, hours, and any required notices
- ☐ Trim back shrubs and clear exterior access to each window
- ☐ Move planters, hoses, and fragile landscaping features
- ☐ Check the weather forecast; discuss rain plans with the contractor

PRACTICAL & PAYMENT

- ☐ Set up a dust-protection plan for adjoining rooms
- ☐ Designate a staging area for tools and new windows
- ☐ Have the contract and payment details ready per the agreed schedule
- ☐ Prepare to document concealed conditions (camera/phone) if asked
- ☐ Keep the final-inspection checklist (Section 25) handy

→ KEY TAKEAWAY

Two things save the most hassle: **clearing access** (inside and out) so the crew works efficiently, and **agreeing in advance how changes get approved** so nothing is decided in a rushed moment mid-install.

⚠ TECHNICAL NOTE

In a condominium or apartment, confirm booking requirements, permitted work hours, insurance certificates the building may require from the contractor, and any rules about exterior appearance *before* installation day — these can stop a job cold.

Installation-Day Observation Guide

You don't need to hover — and you shouldn't get in the crew's way. But a few informed, well-timed observations protect your investment and create a record if anything is disputed later.

What you can reasonably check

- **Confirm the product.** Check that the delivered windows match your contract — make, series, size, colour, and glass.
- **Look for shipping damage.** Note scratches, cracks, or dents on units *before* they go in.
- **Watch opening preparation.** On full-frame work, the opening should be inspected and any damage addressed before the new frame goes in.
- **Photograph concealed conditions.** With the crew's awareness, a quick photo of the open rough opening, flashing, and insulation creates a useful record you can't see once trim is on.
- **Record change orders.** If hidden damage is found, get the fix and its price in writing before work continues.

⚠ OBSERVE — DON'T INTERFERE

Stay clear of the immediate work area, don't handle tools or materials, and raise concerns with the lead installer between tasks rather than mid-lift. Your job is to notice and document, not to supervise the trade.

→ KEY TAKEAWAY

The highest-value moment to observe is when a full-frame opening is **open and exposed** — before flashing, insulation, and trim hide everything. A few photos here are worth more than a dozen after the job is closed up.

🕒 REASONABLE QUESTIONS DURING INSTALL

- Can you confirm these units match my contract before installing?
- Is the opening sound, or did you find any damage?
- May I take a couple of photos of the opening before it's closed up?
- If you found something unexpected, can we document the change and price now?

Final Inspection Checklist

Before you release final payment, walk every window with this list. Documenting deficiencies now — while you still hold the final payment — is your strongest position for getting them fixed.

- | | |
|--|--|
| ☐ Correct windows installed at every opening (make, series, size) | ☐ Interior trim is finished and neat |
| ☐ Correct colour and style, inside and out | ☐ Exterior sealant is consistent and complete |
| ☐ Every operable window opens and closes smoothly | ☐ Drainage / weep openings are clear and unobstructed |
| ☐ All locks and latches engage properly | ☐ Work areas cleaned and debris removed |
| ☐ Screens are present and fit correctly | ☐ Manufacturer labels and warranty info received |
| ☐ Glass is undamaged — no cracks or chips | ☐ Permit inspection completed and passed (where required) |
| ☐ No scratches on glass or frames | ☐ Any deficiencies documented in writing with photos |
| ☐ No unexplained gaps around any frame | ☐ Final-payment terms tied to deficiency correction |

⚠ DON'T RELEASE FINAL PAYMENT UNTIL THE LIST IS CLEAN

Your leverage to get deficiencies fixed is highest before the final payment clears. Create a written deficiency list (Section 29, M-Deficiency), have the contractor acknowledge it, and agree what will be corrected and by when before you pay in full.

△ TECHNICAL NOTE

Keep those manufacturer labels and the warranty paperwork. Many warranties require you to have registered the product and to produce proof of the certified model — the labels and documents you collect at sign-off are what make a future claim possible.

→ KEY TAKEAWAY

Inspect against your *contract*, not your memory. Match every window to what you ordered, document anything that's off, and only release final payment once the deficiency list is resolved or a written correction plan is in place.

Maintenance & Ownership Records

Good windows last a long time when they're looked after — and warranty claims go smoothly when your paperwork is in order. A few minutes of routine care each season protects a major investment.

Routine maintenance by component

Component	What to do
Glass	Clean with a mild, non-abrasive cleaner; avoid harsh chemicals and scrapers that can scratch coatings.
Frames	Wipe down; for wood, inspect the finish and reseal/repaint as needed before bare wood is exposed.
Tracks & sills	Vacuum and wipe out grit that jams sliding sashes and blocks drainage.
Drainage / weep holes	Keep clear so water drains out rather than pooling — a common, easily-missed task.
Hardware	Check locks and operators; a little appropriate lubricant keeps them smooth.
Weatherstripping	Inspect for wear or gaps; replace worn strips to keep drafts out.
Sealant / caulking	Check exterior joints yearly; re-seal cracked or missing sections before water gets in.
Screens	Brush clean; repair small tears; store carefully if removed for winter.
Wood finishes	Watch for peeling or dark spots that signal moisture; address promptly.

Seasonal maintenance calendar

SPRING

Clean glass and screens; check exterior sealant after winter; clear weep holes; test operation.

SUMMER

Inspect for sun/heat effects; lubricate hardware; check for drafts and daylight gaps.

AUTUMN

Re-seal any cracked caulk before cold; check weatherstripping; clean tracks and drainage.

WINTER

Watch for interior condensation (manage humidity, §11); note any drafts to address in spring.

Ownership & warranty record

Fill this in once and keep it with your home documents. It’s what turns a future warranty claim from a frustrating hunt into a quick phone call. A printable copy is in Section 29 (M-Warranty Record).

INSTALLATION DATE	CONTRACTOR / COMPANY NAME
CONTRACTOR CONTACT (PHONE / EMAIL)	MANUFACTURER
PRODUCT SERIES / MODEL	FRAME MATERIAL & COLOUR
GLASS PACKAGE	WHOLE-WINDOW U-FACTOR / ER
NUMBER OF WINDOWS & LOCATIONS	PRODUCT WARRANTY LENGTH & TERMS
LABOUR WARRANTY LENGTH & TERMS	WARRANTY REGISTRATION DATE / NUMBER
PERMIT NUMBER (IF ANY)	FINAL INSPECTION DATE
WHERE LABELS & DOCUMENTS ARE STORED	NOTES

→ KEY TAKEAWAY

Store the manufacturer labels, the signed contract, the itemized quote, warranty documents, permit paperwork, and your installation-day photos together in one place. That single folder is your proof of what you bought and your key to any future claim.

Specialized Buying Situations

The general process still applies, but some situations add rules, constraints, or priorities worth flagging early. Find yours below before you shop.

Condominiums

Windows are often shared/common elements. Check the declaration and board rules on who owns, approves, and pays for window work, and on exterior appearance. Get written board approval before ordering.

Rental properties

Landlord-tenant rules govern access, notice, and habitability. Egress and safety compliance is especially important in units with bedrooms; verify local requirements and give proper notice.

Historic / heritage homes

Heritage designations may restrict style, materials, muntin patterns, and colours. Confirm what's permitted with the heritage authority; wood or wood-clad with authentic profiles is often required.

Basement windows

Frequently involve egress (\$13), window wells, drainage, and moisture. Confirm required opening sizes and well clearances locally, and address drainage so wells don't fill with water.

Coastal climates

Salt air corrodes some finishes and hardware; wind-driven rain and storm debris raise the bar. Look for corrosion-resistant finishes and, where relevant, impact-rated laminated glazing — and check warranty coastal exclusions.

Very cold climates

Prioritize low U-factor, warm-edge spacers, and good air-tightness for comfort and condensation resistance; consider triple glazing and passive-gain Low-E on the right exposures (\$10).

Specialized situations — continued

Hot climates

Prioritize solar control: a lower SHGC and solar-control Low-E to cut cooling load and glare, especially on east/west/south exposures (§10).

High-noise locations

Target laminated glass, unequal pane thicknesses, and airtight installation; ask for tested STC/OITC ratings and fix other sound paths too (§12).

Homes with children

Use opening restrictors and cordless coverings for fall and cord safety, without compromising emergency escape on required egress windows (§13).

Accessibility needs

Consider easy-operating styles (casement cranks, tilt-and-turn), reachable hardware heights, and low-force operation for users with limited strength or mobility.

Large custom windows

Expect longer lead times, higher cost, structural considerations, and stronger frame materials (fibreglass/aluminum). Confirm handling and installation access for oversized units.

Multi-stage renovations

If you're replacing windows over several phases, standardize the product line, colour, and specs now so later phases match, and keep detailed records for consistency.

⚠ THE TWO THAT MOST OFTEN TRIP PEOPLE UP

Condominiums (approvals and who pays) and **egress in basements/secondary suites** (code compliance) cause the most expensive surprises. Resolve both in writing before you order a single window.

→ KEY TAKEAWAY

The buying process in this guide doesn't change for these cases — you just add the relevant constraint early. Identify your situation now, verify its specific local rules, and carry that requirement into your scope (Section 17).

Frequently Asked Questions

Straight answers to the questions homeowners ask most often before a window project. Each points back to the section with the full story.

Q Should I replace all my windows at once?

Not necessarily. Replacing all at once can lower the per-window cost and give a uniform look, but a phased approach spreads the cost and is fine if you standardize the product line and specs so later windows match. Prioritize the worst-performing or failed windows first.

Q Is triple glazing worth it?

It depends on your climate, comfort goals, and budget. Triple glazing lowers heat loss and gives warmer, quieter glass, which many value in cold climates — but the extra cost doesn't always return the same financial payback in every home. Weigh comfort against cost for your situation rather than assuming more panes is automatically better.

Q Can the glass be replaced without replacing the whole window?

Often, yes. If only the sealed glass unit has failed (fogging between panes) and the frame and sash are sound, the insulating glass unit — or the sash — can frequently be replaced on its own for far less than a new window. Have it inspected to confirm the frame is sound.

Q Do new windows increase home value?

New windows can improve a home's appeal, comfort, and efficiency, which may help at sale — but the effect varies by market, home, and the quality of the work. Treat resale as one factor among several rather than a guaranteed return, and be wary of anyone promising a specific dollar increase.

Q How long should installation take?

It varies with the number of windows, the method (full-frame takes longer than insert), access, and any repairs. Many homes are done in one to a few days. Ask each contractor for an estimated timeline in writing and what could extend it.

Q Should I choose full-frame or insert installation?

It depends on the inspected condition of your existing frames. Insert preserves finishes, costs less, and suits sound frames; full-frame costs more but lets the installer correct rot, out-of-square openings, and water management. Never let anyone decide before inspecting your frames (Section 14).

Q How much deposit is normal?

Deposits vary by region and are typically tied to ordering custom materials. A reasonable, defined deposit is normal; a demand for most of the price up front, or cash-only, is a warning sign (Section 20). Confirm what's customary in your area and get the schedule in writing.

Q Should I buy in winter or off-season?

Some contractors are less busy and more flexible in slower seasons, and installation in cold weather is routine for experienced crews using proper techniques. The bigger savings come from comparing quotes well, not from timing alone.

Q What causes the sealed unit to fog up?

Fog between the panes means the insulating glass unit's edge seal has failed, letting humid air in and saturating the desiccant. It's a sign the unit has lost performance and usually needs the glass unit replaced (Sections 5 and 9).

Q Will replacement windows eliminate condensation?

Not always. Fog between the panes is fixed by replacing the failed unit. But condensation on the room-side glass is usually caused by high indoor humidity meeting cold glass — better windows resist it longer but won't eliminate it if humidity stays high (Section 11).

Q Can a contractor measure without entering the home?

For an accurate quote and proper fit, an installer generally needs to inspect and measure the openings in person, from inside and out. A firm quote produced without seeing your windows should be treated cautiously.

Q Are black or dark frames harder to maintain?

Dark finishes show dust and water spots more and absorb more heat, which matters most for materials that expand with temperature (like vinyl). Choose a product line rated for the dark colour, and check the finish warranty. Maintenance is otherwise similar.

Q Are “lifetime” warranties truly for a lifetime?

Rarely in the absolute sense. “Lifetime” often means the manufacturer's defined product lifetime, may apply only to the original owner, may cover only certain parts, and is frequently prorated so its value declines over time. Read the definition and exclusions (Section 22).

Q Should I remove the manufacturer labels right away?

No — leave them until after any required permit/final inspection and until you've recorded the model and ratings. Those labels prove the certified product was installed and support warranty registration (Section 25).

Q What should I do if the finished work has defects?

Document each defect in writing with photos, share the list with the contractor, and agree what will be fixed and by when — before releasing final payment. A written deficiency list and retained final payment are your strongest tools (Section 25).

Q How many quotes should I get?

Three to five. Fewer gives you no real basis for comparison; more becomes hard to manage. Give each the identical written scope so the numbers are comparable (Sections 17 and 18).

Q What's the single most important number to compare?

The whole-window U-factor (and, in Canada, the Energy Rating) for the same size and operator type. It's independently tested the same way for every product, so it's the fairest apples-to-apples comparison (Section 10).

Q Is a bigger company always safer than a small installer?

No. Size doesn't guarantee quality or longevity. What matters is verifiable insurance, references, who actually installs, and who honours the labour warranty — for a company of any size (Section 19).

Q Do I need a permit to replace windows?

Sometimes. Simple like-for-like replacements may not require one, while enlarging openings, changing egress, or structural work usually does. Requirements vary by municipality — always confirm locally and clarify who pulls the permit (Sections 16 and 21).

Q Can I install windows myself to save money?

It's possible for the handy, but installation quality drives real-world performance and warranty validity. Poor installation is a common warranty exclusion, and mistakes with flashing or air sealing can cause hidden water damage. Weigh the savings against the risk (Section 15).

Q Why are two quotes for “the same” windows so different?

Usually because the scope or specification differs: glass package, spacer, installation method, flashing, disposal, trim, permits, or warranty. Compare row by row on the worksheet in Section 18 before judging price.

Q What's the difference between U-factor and R-value?

They're inverses — U-factor measures heat flow (lower is better), R-value measures resistance (higher is better). Windows are officially rated by U-factor / Energy Rating, not R-value, which is more a marketing term for glass. Compare the certified U-factor (Section 10).

Q Does argon gas leak out over time?

Sealed units can lose a small amount of fill gas very slowly over many years, which is normal and gradual. A sudden loss of performance is more likely a seal failure (visible as fogging). Warm-edge, well-made units help maintain the fill longer (Section 9).

Q Should the whole house use one window style?

Not required. It's common and often smart to mix styles — casements where sealing and airflow matter, fixed for big views, hung or slider for budget and a traditional look. Match each opening's style to its job (Section 7).

Q What if I find hidden rot once the old window is out?

This is why a written change-order process matters. A good contract states how unexpected conditions are documented, priced, and approved before work continues, so you're not surprised by a bill or a sealed-in problem (Sections 17 and 21).

Q How do I know a window is actually ENERGY STAR certified?

Look for the certification on the product label and verify the model in the official NRCAN/NFRC directories rather than relying on a verbal claim. Ask the contractor for the exact model so you can check it yourself (Section 10).

→ KEY TAKEAWAY

If you take away one habit from this guide: put everything in writing and compare like with like. It resolves most of the questions above before they become problems.

Printable Worksheets

Every worksheet from this guide, collected in one place to print and carry. Photocopy or reprint any page as many times as you need — one quote worksheet per contractor, one inventory row per window.

15

WORKSHEETS

3–5

QUOTES TO COMPARE

1

FINAL DECISION

→ KEY TAKEAWAY

Print this section on its own. The worksheets are designed to be filled in by hand as you move through the project — from first inspection to final sign-off — so you finish with a complete written record of your decision.

What's in this section

- M1 · Window-condition assessment
- M2 · Room-by-room window inventory
- M3 · Needs & priorities
- M4 · Repair-vs-replace decision
- M5 · Product comparison
- M6 · Glass-package selection
- M7 · Contractor interview
- M8 · Three-contractor quote comparison
- M9 · Warranty comparison
- M10 · Project budget
- M11 · Installation-prep checklist
- M12 · Installation-day notes
- M13 · Final-inspection checklist
- M14 · Deficiency list
- M15 · Final decision scorecard

M1 • Window-condition assessment

Fill one for each window you’re evaluating. Reprint as needed.

ROOM / LOCATION	WINDOW # / LABEL
STYLE (HUNG, CASEMENT, SLIDER...)	APPROX. AGE (IF KNOWN)
FRAME MATERIAL	APPROX. SIZE
CONDITION CHECK	
☐ Drafty / air leaks felt	
☐ Fog or moisture between panes	
☐ Condensation on room-side glass	
☐ Difficult to open / close / lock	
☐ Visible rot, damage, or decay	
☐ Water stains or leaks nearby	
☐ Cracked or broken glass	
☐ Peeling paint / failing finish	
☐ Meets egress if a bedroom (§13)	
OVERALL CONDITION (GOOD / FAIR / POOR)	REPAIR OR REPLACE? (SEE M4)
NOTES	

M2 · Room-by-room window inventory

List every window in the home so nothing is missed and quotes are complete.

Room	Window label	Style	Approx. size	Condition	Replace? (Y/N)

M3 · Needs & priorities

Rank what matters most for this project. It will guide every trade-off ahead.

RANK 1 (MOST IMPORTANT) TO 8

Priority	Rank (1-8)	Why it matters to us
Lower energy bills / efficiency		
Comfort (drafts, temperature)		
Noise reduction		
Appearance / curb appeal		
Low maintenance		
Security & safety		
Budget / lowest cost		
Durability / longevity		

TOTAL BUDGET RANGE

TARGET TIMEFRAME

MUST-HAVES VS NICE-TO-HAVES

M4 · Repair-vs-replace decision

Work through per window or per group. See Section 5 for guidance.

Factor	Points toward REPAIR	Points toward REPLACE	Our note
Frame condition			
Extent of the problem			
Number of failed windows			
Age of windows			
Energy performance			
Cost of repair vs replacement			
Long-term plans for home			

LEANING TOWARD

DECISION & DATE

M5 · Product comparison

Compare up to three products you’re considering, apples to apples.

Criterion	Option A	Option B	Option C
Manufacturer / line			
Frame material			
Window style			
Glass package			
Whole-window U-factor			
Energy Rating (ER)			
SHGC			
Certification (ES / NFRC)			
Colour options			
Warranty summary			
Approx. price			
Overall fit (1-10)			

M6 · Glass-package selection

Decide the right glass for each exposure. See Section 9-10.

Window / exposure	Panes (2/3)	Low-E?	Gas fill	Warm-edge spacer?	Safety/egress glass?	Notes

 PROMPTS

- Which exposures need solar control (lower SHGC)?
- Which rooms would benefit from triple glazing?
- Where is safety or egress glass required?

M7 • Contractor interview

One per contractor. Full question list in Section 19.

COMPANY	CONTACT / DATE
YEARS UNDER THIS NAME	INSURANCE VERIFIED? (Y/N)
LICENCE/REGISTRATION (IF REQ.)	WORKERS' COMP (IF REQ.)
EMPLOYEES OR SUBS INSTALL?	TRAINED ON THIS PRODUCT?
AUTHORIZED DEALER?	REFERENCES PROVIDED?

ANSWERS THAT MATTERED

INSTALLATION METHOD & FLASHING/AIR-SEAL APPROACH

WHAT'S INCLUDED VS EXCLUDED; CHANGE-ORDER PROCESS

LABOUR WARRANTY (WHO / HOW LONG)	OVERALL IMPRESSION (1-10)
---	----------------------------------

M8 · Three-contractor quote comparison

Page 1 of 2 — product & installation. Full version in Section 18.

Criterion	A	B	C
Contractor / company			
Manufacturer & line			
Certification			
Frame material			
Window style(s)			
Glass package			
Whole-window U-factor / ER			
SHGC			
Safety/egress glass where needed			
Install method (insert/full-frame)			
Trim / capping included			
Flashing & air-seal method			

M8 · Three-contractor quote comparison — money & score

Page 2 of 2 — compare price only after every row above.

Criterion	A	B	C
Removal & disposal included			
Permit responsibility			
Timeline / lead time			
Product warranty (yrs/terms)			
Labour warranty (yrs)			
Key exclusions			
Promises put in writing?			
Total price (before tax)			
Taxes			
Total (with tax)			
Deposit & milestones			
Value score (1-10)			

⚠ CHOOSE ON VALUE, NOT THE LOWEST NUMBER

The best quote is rarely the cheapest. Weigh the whole row set, and treat any quote far below the others as incomplete until proven otherwise.

M9 • Warranty comparison

Compare real coverage, not headlines. See Section 22.

Criterion	A	B	C
Product / frame term			
Glass seal-failure term			
Hardware term			
Finish term			
Labour warranty term			
Labour included in claims?			
Prorated? (Y/N + schedule)			
Transferable? (terms/fee)			
Registration required? (deadline)			
Key exclusions			
Claim contact			

M10 • Project budget

Build a realistic total, including the things quotes sometimes omit.

Line item	Estimated	Actual	Notes
Windows (product)			
Installation labour			
Full-frame / repair work			
Interior finishing (trim, paint)			
Exterior capping / flashing			
Removal & disposal			
Permit & inspection fees			
Custom / oversized upcharges			
Contingency (hidden damage)			
Taxes			
TOTAL			

 TECHNICAL NOTE

Build in a contingency for hidden conditions found once old windows come out (\$24). If it isn't needed, you've simply come in under budget.

M11 • Installation-prep checklist

Complete a day or two before installation. Full guidance in Section 23.

INSIDE

- ☐ Furniture moved 1.5–2 m back
- ☐ Curtains, blinds, hardware removed
- ☐ Wall art / shelves near windows down
- ☐ Fragile & valuable items protected
- ☐ Windowsills cleared
- ☐ Alarm sensors noted/adjusted

PEOPLE, ACCESS & LOGISTICS

- ☐ Children kept clear of work areas
- ☐ Pets secured in a separate room
- ☐ Parking / driveway access clear
- ☐ Elevator booked (condo/high-rise)
- ☐ Shrubs trimmed, exterior access clear
- ☐ Floors/dust protection confirmed
- ☐ Payment ready per contract

M12 • Installation-day notes

Record what happened and photograph the hidden details (Section 24).

DATE	CREW / LEAD INSTALLER
------	-----------------------

PRODUCT VERIFIED VS CONTRACT? (Y/N)	SHIPPING DAMAGE FOUND? (Y/N)
-------------------------------------	------------------------------

CONDITION OF OPENINGS AFTER REMOVAL (PHOTOS TAKEN? ☐)

SURPRISES FOUND (ROT/DAMAGE) & CHANGE ORDERS APPROVED (IN WRITING?)

FLASHING / SEALING PHOTOGRAPHED BEFORE COVERING? NOTES

☐ Manufacturer labels photographed

☐ Change orders signed

☐ Work area protected

M13 • Final-inspection checklist

Walk every window in daylight before final payment (Section 25).

PRODUCT & OPERATION

- ☐ Correct windows at every opening
- ☐ Correct colour, style, glass
- ☐ Glass undamaged (no cracks/chips)
- ☐ No scratches on glass or frames
- ☐ Every operable window works smoothly
- ☐ All locks engage
- ☐ Screens fit and undamaged

FINISH, SITE & PAPERWORK

- ☐ No unexplained gaps around frames
- ☐ Interior trim finished neatly
- ☐ Exterior sealant complete
- ☐ Weep/drainage holes clear
- ☐ Work area cleaned
- ☐ Labels / warranty info received
- ☐ Permit inspection passed (if req.)
- ☐ Deficiencies documented (M14)

⚠ HOLD FINAL PAYMENT

Don't release final payment until the deficiency list (M14) is resolved or a written, dated plan is agreed.

M14 • Deficiency list

List every issue, however small, with the agreed fix and date. Both parties sign.

#	Window / location	Issue	Agreed fix	Target date	Done ✓
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

HOMEOWNER SIGNATURE / DATE

CONTRACTOR SIGNATURE / DATE

M15 • Final decision scorecard

Bring it all together. Score each finalist 1–10 per criterion, then total.

Criterion	A	B	C
Product quality & ratings			
Right installation method			
Installer trust & references			
Warranty (real coverage)			
Everything in writing			
Value for price			
Timeline fits			
Comfort with the company			
TOTAL (/80)			

OUR CHOICE

DECISION DATE

WHY WE CHOSE THEM

→ KEY TAKEAWAY

If one finalist wins on trust, written commitments, and value — not just price — you’ve made a decision you can stand behind.

Glossary of Terms

Every technical term used in this guide, in plain language. Use it as a quick reference while you read quotes, labels, and contracts.

Air leakage (AL)

How much air passes through a window assembly; lower ratings mean a tighter, less drafty window.

Argon

An inert gas used to fill the space between panes to slow heat transfer and improve insulation.

Awning window

A window hinged at the top that swings outward, letting it stay open in light rain.

Bay / bow window

A window unit that projects outward from the wall in angled (bay) or curved (bow) sections.

Capping (cladding)

Aluminum trim wrapped around exterior wood to protect it and give a finished, low-maintenance look.

Casement window

A window hinged at the side that cranks outward, sealing tightly against its frame when closed.

Caulk / sealant

A flexible material used to seal joints against air and water; cosmetic caulk is not the same as a proper air or water seal.

Condensation

Water that forms when humid air meets a cooler surface; on the room-side glass it usually signals high indoor humidity.

Condensation resistance (CR)

A rating of how well a window resists interior condensation; higher is better.

Desiccant

A drying agent inside the spacer of a sealed glass unit that absorbs moisture; it saturates once the seal fails.

Double glazing

An insulating glass unit with two panes separated by a sealed, often gas-filled, space.

Egress window

A window sized and positioned to allow emergency escape or rescue; bedrooms often require one by code.

Energy Rating (ER)

A Canadian whole-window score combining heat loss, solar gain, and air leakage; higher is better.

ENERGY STAR

A certification identifying products that meet efficiency criteria; in Canada it is administered by NRCan.

Fibreglass frame

A strong, stable frame material made from glass fibres, resistant to expansion and warping.

Fixed window

A non-opening window built purely for light and views.

Flashing

Materials and techniques that direct water away from the window opening to prevent leaks and damage.

Full-frame installation

Replacement that removes the window down to the rough opening, allowing repair and re-flashing.

Gas fill

Argon or krypton sealed between panes to improve insulation over plain air.

Glazing

The glass in a window; also refers to the number and type of panes (single, double, triple).

Hung window (single/double)

A window with sashes that slide vertically; double-hung units have two operable sashes.

Insert (retrofit) installation

Replacement that fits a new window into the existing frame, preserving interior and exterior finishes.

Insulating glass unit (IGU)

A factory-sealed assembly of two or more panes with a spacer and gas fill; failure shows as fog between panes.

Jamb

The vertical sides of a window frame.

Krypton

A denser, costlier insulating gas fill used mainly in narrow triple-glazed cavities.

Laminated glass

Glass bonded to a plastic interlayer that holds together when broken; improves safety and sound control.

Low-E coating

A microscopically thin coating that reflects heat, improving efficiency; different types suit different climates.

Muntins / grilles

Bars that divide glass into smaller panes, either structural or decorative.

NFRC

An independent non-profit that administers a standardized whole-product window energy-rating system.

NRCan

Natural Resources Canada, which administers ENERGY STAR for windows in Canada and the Energy Rating metric.

Obscure glass

Textured or frosted glass that provides privacy while letting light through.

Operable window

Any window designed to open, as opposed to a fixed window.

Picture window

A large fixed window that maximizes an unobstructed view.

Proration

A warranty term reducing coverage value over time, so you pay a growing share of repairs as the product ages.

R-value

A measure of thermal resistance (higher is better); used informally for glass, but windows are officially rated by U-factor.

Rough opening

The framed wall opening into which a window is installed.

Sash

The moving (or fixed) framed part of a window that holds the glass.

Screen

A mesh panel that keeps insects out while a window is open.

Sealed unit failure

Loss of the IGU edge seal, letting moisture in and causing permanent fogging between panes.

SHGC (Solar Heat Gain Coefficient)

The fraction of solar heat a window admits; lower reduces cooling load, higher aids winter warmth — the right choice depends on climate and orientation.

Sill

The horizontal bottom of a window frame.

Single glazing

A single pane of glass with minimal insulating value; rare in modern replacements.

Slider window

A window whose sash slides horizontally to open.

Spacer

The component separating panes at the edge of an IGU; warm-edge spacers reduce heat loss and edge condensation.

STC / OITC

Ratings of how well an assembly blocks sound; higher numbers mean more noise reduction.

Tempered glass

Heat-treated safety glass that breaks into small blunt pieces; often required in hazardous locations.

Tilt-and-turn window

A versatile window that tilts in at the top for ventilation or swings in fully for cleaning and escape.

Triple glazing

An insulating unit with three panes for greater efficiency, comfort, and sound control.

U-factor

The rate of heat flow through a window (lower is better); the primary tested metric for comparing window efficiency.

Vinyl (PVC) frame

A common, low-maintenance, cost-effective frame material with good insulating value.

Visible transmittance (VT)

The fraction of visible light a window lets through; higher means a brighter room.

Warm-edge spacer

A spacer made of less-conductive materials to reduce heat loss and condensation at the glass edge.

Weatherstripping

Flexible sealing material that blocks air and water where a sash meets the frame.

Weep holes

Small openings that let water drain out of the frame instead of pooling.

Wood-clad frame

A wood interior paired with a protective aluminum or vinyl exterior for lower maintenance.

→ KEY TAKEAWAY

When a salesperson or contract uses a term you're unsure of, look it up here before you agree to anything. Clear language is the homeowner's best protection.

Research & Sources

This guide favours independent, authoritative sources over manufacturer marketing. The references below support the technical claims marked with a superscript number in the text. Standards, codes, and programs change — always verify current details for your own jurisdiction.

Ref	Source	Reference
[3]	National Fenestration Rating Council (NFRC) Energy performance ratings and the NFRC label — how whole-window U-factor, SHGC, VT, and air leakage are independently tested and reported.	nfrclabel.org
[5]	NFRC Understanding the U-factor rating on the NFRC label.	nfrclabel.org
[6]	NFRC Understanding the Solar Heat Gain Coefficient (SHGC).	nfrclabel.org
[7]	NFRC Understanding Visible Transmittance (VT).	nfrclabel.org
[8]	NFRC Understanding the Air Leakage (AL) rating.	nfrclabel.org
[9]	NFRC Understanding the Condensation Resistance (CR) rating.	nfrclabel.org
[10]	U.S. Department of Energy — Energy Saver Window types, glazing, and approximate insulating values of single, double, and coated/gas-filled glazing.	energy.gov
[11]	Lawrence Berkeley National Laboratory (LBNL) Research on warm-edge spacers and their effect on whole-window U-value in higher-performance glazing.	lbnl.gov
[13]	Natural Resources Canada (NRCAN) — ENERGY STAR for windows, doors, and skylights Canadian ENERGY STAR criteria, the single national climate zone (effective 2020), and the Energy Rating (ER) metric.	natural-resources.canada.ca

Sources — continued

Ref	Source	Reference
[14]	Natural Resources Canada (NRCan) Guidance on comparing windows by U-factor and Energy Rating rather than R-value.	natural-resources.canada.ca
[15]	Lawrence Berkeley National Laboratory (LBL) Edge-of-glass heat transfer and condensation performance of insulating spacer systems.	lbl.gov
[16]	Ontario Building Code — egress/bedroom window requirements Minimum unobstructed openable area and dimensions for required escape windows, and window-well clearances (verify the current edition and your municipality).	ontario.ca
[19]	Natural Resources Canada (NRCan) Note that R-value is commonly cited in sales but is not the official window performance metric.	natural-resources.canada.ca

 **TECHNICAL NOTE**

Access note: the sources above were consulted during the preparation of this First Edition (2026). Web addresses and program criteria change over time. For any decision that depends on codes, egress rules, permits, rebates, or certification, confirm the current requirements directly with the relevant authority for your location.

About this guide

 **THIS GUIDE IS EDUCATIONAL, NOT PROFESSIONAL ADVICE**

It is independent and not sponsored by any manufacturer or contractor. It does not recommend specific brands. Building codes, egress requirements, licensing, permits, and rebate programs vary by location and change over time — verify anything jurisdiction-specific with your local authorities and qualified professionals before you rely on it.

 **KEY TAKEAWAY**

Work the worksheets in Section 29, keep everything in writing, and compare like with like — that discipline is what turns a daunting purchase into a confident one.