



RESIDENTIAL SERVICES · NORTHERN ONTARIO

Cold-Weather Residential Window Cleaning

Physics, risk assessment, and field practice for cleaning residential windows in freeze-thaw conditions — North Bay, Sudbury, and surrounding Northern Ontario communities.

-30°C

Min Ambient Studied

52°C

Max Safe ΔT (Triple Low-E)

22

Glass Configurations

5-var

Risk Calculator

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SECTION 01

Why Cold Weather Changes Window Cleaning Physics

Residential window cleaning in Northern Ontario is not a year-round proposition. The freeze-thaw transition period — typically spanning late February through mid-April in North Bay and Sudbury — creates a narrow operational window in which cleaning is both technically feasible and physically safe. Outside that window, the physics of glass, water, and temperature interact in ways that can damage windows, create safety hazards, and produce results worse than leaving the glass dirty.

The core challenge is not cold air. It is the gap between the temperature of the glass surface and the temperature of the cleaning solution at the moment of contact. This gap — called the temperature differential, or ΔT — determines whether the glass experiences manageable thermal expansion or damaging thermal shock. The same glass that handles a 30°C ΔT safely in summer becomes vulnerable to fracture at a 30°C ΔT in March, because the absolute glass surface temperature is lower, and edge seals and micro-defects are already stressed by freeze-thaw cycling.

The Northern Ontario Context

North Bay and Sudbury average 100–130 freeze-thaw cycles per year. Each cycle stresses edge seals and any existing micro-defects in glass. A pane that has survived 10 winters without issue may be closer to its fracture threshold than it looks — and thermal shock from improper cleaning can be the final stressor.

What Changes at Low Temperature

Three material properties of glass change at low temperature in ways relevant to cleaning. First, the modulus of elasticity increases slightly, making the glass more brittle and less able to absorb localized stress by deforming. Second, the coefficient of thermal expansion remains roughly constant, meaning the same ΔT produces the same dimensional change — but the glass is less able to accommodate it. Third, and most importantly, the frame and edge seal contract at different rates than the glass, creating pre-existing stress at the perimeter even before cleaning begins.

Low-E coatings — standard on virtually all post-2000 Ontario residential windows — add an additional variable. By reflecting infrared radiation back into the building, Low-E coatings reduce heat transfer from indoors to the outer glass pane. This keeps the outer pane colder than non-Low-E glass in identical conditions. A homeowner who checks the air temperature at +2°C and concludes their windows are warm enough to clean may find the outer surface of their Low-E double-pane unit is still at -8°C.

-10°C

-25°C

-30°C

8°C

Min safe surface, □single annealed glass Min safe surface, □double Low-E Min safe surface, □triple Low-E Max solar gain, □direct sun

The practical takeaway is that cleaning windows in Northern Ontario requires a five-variable assessment before starting each session: ambient air temperature, wind speed, solar exposure of the glass face, cleaning solution temperature at the point of application, and glass type. Skipping any one of these creates unnecessary risk — particularly for homeowners working with older single-pane annealed glass or modern triple-pane Low-E units at the extremes of the tolerance curve.

SECTION 02

Glass Science: Thermal Shock and Edge Stress

Thermal shock in glass occurs when a temperature gradient across a pane develops faster than the material can equilibrate through conduction. The result is differential thermal expansion: the warmer region tries to expand while the cooler region resists. The stress this creates is tensile — glass under tension is far weaker than glass under compression, which is why thermal shock failures almost always initiate at the edge, where the frame constrains expansion most tightly.

The Physics of Edge Stress

For a rectangular pane constrained in a rigid frame, the thermal stress σ at the edge under a temperature differential ΔT is approximately:

Thermal Stress Approximation

$\sigma = (E \cdot \alpha \cdot \Delta T) / (1 - \nu)$ where E = Young's modulus (~70 GPa for float glass), α = coefficient of thermal expansion (~ 9×10^{-6} /°C), ν = Poisson's ratio (~0.22). At $\Delta T = 30^\circ\text{C}$, $\sigma \approx 24$ MPa — approaching the tensile strength of annealed glass (25–50 MPa at the edge with pre-existing micro-cracks).

This approximation assumes a uniform ΔT across the pane, which never occurs in practice. When cleaning solution is applied to one corner first, the temperature gradient is highly localized, creating stress concentrations that can exceed the uniform- ΔT prediction by a factor of 1.5 to 2. This is why the application technique — small sections, top to bottom, avoiding pooling — matters as much as the absolute ΔT value.

Annealed vs. Tempered vs. Low-E Glass

Annealed glass — the baseline product used in most pre-1990 residential construction — has a tensile strength at the edge of approximately 25 MPa in new condition, degrading to 15–20 MPa in aged glass with micro-defects from years of freeze-thaw cycling. This means a ΔT of 30°C can produce edge stress in a range that overlaps with the failure threshold.

Tempered glass, by contrast, is compressed during manufacturing by controlled heating and rapid cooling. The surface compression (typically 70–100 MPa) must be overcome before any tensile

failure can occur, giving tempered glass an effective ΔT tolerance of 50–55°C compared to 25–30°C for annealed. This is why shower doors, entry sidelites, and some post-1990 residential panes are significantly more resistant to thermal shock.

Low-E coatings are thin metallic or ceramic oxide films applied to the glass surface during manufacturing. They do not affect the glass's intrinsic thermal shock tolerance — the glass substrate is the same. Their impact is on the temperature the outer pane reaches in cold weather: because the coating reduces heat flow from indoors, the outer pane tracks outdoor temperature more closely, often reaching -15°C to -20°C on cold Northern Ontario mornings while air temperature reads -8°C.

Insulated Glass Unit (IGU) Seal Risk

Modern double and triple-pane windows are not monolithic — they are insulated glass units (IGUs) with two or three panes separated by a spacer and sealed with polymer sealants. The edge seal is the most vulnerable component. Repeated thermal cycling, UV exposure, and cleaning chemical contact degrade the primary seal (polyisobutylene) and the secondary seal (silicone or polysulfide) over time.

When a cold IGU outer pane is struck by warm cleaning solution, the edge seal experiences a ΔT that includes both the pane temperature change and the conductive transfer to the seal material. Polymer seals have lower elastic modulus at cold temperature, reducing their ability to accommodate differential expansion between the glass and aluminum spacer. Accelerated seal failure manifests as fogging or moisture between panes — a failure mode that is visible, costly to repair, and directly traceable to improper cleaning practice.

Seal Failure Recognition

Fogging between panes is not caused by cleaning solution penetrating the unit — the seal prevents that. It is caused by seal degradation allowing humid air to enter, which then condenses on the cold inner surfaces. If seal failure appears after cleaning, the seal was already compromised — but thermal shock

SECTION 03

Glass Type Reference – Thermal Tolerance by Configuration

The following table summarizes thermal shock tolerance parameters for the 22 residential glass configurations covered in the companion dataset (glass_temp_risk_thresholds.csv). Values are based on manufacturer specifications, glass science literature, and field experience in Northern Ontario cold-weather cleaning conditions.

Glass Type	Panes	Low-E	Min Surface Temp	Max Safe ΔT	Breakage Risk at Max ΔT
Single annealed 3mm	1	No	-10°C	30°C	2.1%
Single annealed 5mm	1	No	-10°C	32°C	1.5%
Single tempered 4mm	1	No	-15°C	55°C	0.3%
Single tempered 6mm	1	No	-15°C	57°C	0.2%
Double IGU annealed	2	No	-20°C	40°C	0.7%
Double IGU Low-E	2	Yes	-25°C	45°C	0.35%
Double IGU Low-E argon	2	Yes	-25°C	47°C	0.30%
Triple IGU annealed	3	No	-30°C	50°C	0.3%
Triple IGU Low-E	3	Yes	-30°C	52°C	0.2%
Triple Low-E argon	3	Yes	-30°C	55°C	0.15%
Laminated 6.4mm	1	No	-10°C	35°C	0.5%
Wired glass 6mm	1	No	-10°C	25°C	3.2%

Note: Breakage probability at maximum delta-T is an approximation based on population studies of glass failure under thermal loading. Individual panes with existing edge damage or seal stress may fail at lower delta-T values. These figures represent new glass in good condition.

Frame Material Effects

The glass type alone does not determine the safe operating threshold – the frame material affects the effective delta-T tolerance by controlling thermal bridging at the edge seal.

Frame Material	Thermal Conductivity	Effect on Outer Pane	Cold-Weather Adjustment
Aluminum (no TB)	160 W/m·K	Conducts cold to edge seal; pane-to-frame	-5°C to effective min surface
Aluminum (TB)	0.3 W/m·K	Thermal break isolates frame; similar to vinyl	Nominal
Vinyl (PVC)	0.17 W/m·K	Good thermal isolation; standard residential	Nominal
Fibreglass	0.36 W/m·K	Slightly higher than vinyl; very stable dimensions	Nominal
Wood	0.13 W/m·K	Best thermal break; traditional Northern Ontario	-2°C to effective min surface

Pre-1990 Aluminum Frame Warning

Non-thermally-broken aluminum frames common in pre-1990 Northern Ontario construction conduct cold directly to the glass edge, reducing the effective minimum safe surface temperature by approximately 5°C compared to the glass specification alone. Apply the -5°C adjustment when assessing

SECTION 04

The Five-Variable Risk Assessment

Reliable cold-weather window cleaning risk assessment requires five inputs. Each has a different measurement method and a different level of precision achievable in the field. The calculator accompanying this guide (available in Python, JavaScript, Rust, and six other languages at https://github.com/veronica_caledon/residential-window-cleaning-2026) processes all five and returns a risk band with a plain-language advisory.

1

Ambient Air Temperature

Read from a calibrated weather station or a phone weather app using the nearest Environment Canada station. Note: readings taken inside a vehicle or near a building exhaust vent will be

2

Wind Speed (km/h)

Estimate from Environment Canada or a handheld anemometer. Wind reduces solar gain on the glass surface by up to 60% at 40 km/h and increases solution evaporation rate, both affecting

3

Sun Exposure Factor (0.0–1.0)

Assess each window face independently. South-facing windows in direct sun: 0.8–1.0. East/west: 0.4–0.6 depending on time of day. North-facing or shaded: 0.0–0.1. Overcast: 0.1 for

4

Cleaning Solution Temperature at Application (°C)

Measure with a thermometer at the brush or squeegee, not at the tank. Hose runs in cold weather can drop solution temperature by 5–10°C from tank to application point, particularly in

5

Glass Type

Identify from window labels (usually etched in the corner), building records, or visual inspection. Post-2000 Ontario homes: almost certainly double Low-E. Post-2010: likely triple Low-E.

Risk Bands and What They Mean

Risk Band	Condition	Proceed?	Key Action
SAFE	ΔT within safe range; glass above min surface temp	Yes	Normal technique; no adjustment required
LOW	ΔT approaching lower threshold	Yes	Pre-wet glass with ambient-temp water before solution
MODERATE	ΔT in elevated-risk range	Yes*	Small sections; top-to-bottom; avoid edge pooling; inspect
HIGH	ΔT exceeds safe maximum	No	Cool solution or allow glass to warm; reassess
DO NOT CLEAN	Glass surface below minimum safe temp	No	Wait for glass to warm; do not proceed regardless of ΔT

* MODERATE: proceed only with technique adjustments and visual seal inspection. If any seal damage, edge chipping, or visible stress cracks are present, defer to a professional assessment before cleaning.

Field Example – North Bay, March Morning

Conditions: -8°C ambient, 15 km/h northwest wind, north-facing double Low-E window, cleaning solution at 18°C (room-temperature bucket, carried outside).

Step 1 – Estimate glass surface: -8°C ambient, wind factor 0.375, no solar gain (north-facing). Estimated surface: $-8 + 0 - 0.19 = -8.2^\circ\text{C}$. Above the -25°C minimum for double Low-E: proceed to ΔT check.

Step 2 – Calculate ΔT: $|18 - (-8.2)| = 26.2^\circ\text{C}$. The MODERATE threshold for double Low-E is 30°C. Result: LOW risk band. Advisory: pre-wet glass with ambient-temperature rinse water before applying solution.

The Intuitive Error

Most homeowners overestimate how warm their glass is on a cold spring day. North-facing double Low-E glass at -8°C ambient air is typically at -8°C to -10°C surface temperature — not warmer. Warm solution applied directly without pre-wetting creates a 25–30°C ΔT in the first seconds of contact.

SECTION 05

Water-Fed Pole Systems in Cold Weather



Water-fed pole (WFP) systems — which deliver purified water through a telescoping pole and brush directly to the glass, then rinse to a spot-free finish — are the preferred professional tool for residential window cleaning in Northern Ontario. They eliminate ladder use for most first and second-storey windows, reduce physical risk, and produce superior results on large glass areas. In cold weather, however, they introduce specific technical challenges beyond those of squeegee-based cleaning.

TDS and Spot-Free Drying

The defining principle of WFP systems is that the rinse water must have zero or near-zero Total Dissolved Solids (TDS) — typically below 10 ppm and ideally below 5 ppm. This is achieved through reverse osmosis (RO) filtration, deionization (DI) resin, or both. When TDS water evaporates on glass, it leaves no mineral deposit, allowing the cleaned glass to dry without spotting or wiping.

In cold weather, the TDS requirement creates a challenge: pure water freezes at 0°C (-0.5°C accounting for trace dissolved gases). With ambient temperatures below 0°C and glass surfaces at or below 0°C, unmodified DI water will freeze on the glass before it rinses fully, and will freeze in the hose and brush during intervals between windows.

Cold-Weather WFP Operational Issues

Issue	Temperature Range	Effect	Mitigation
Solution freeze in brush	Below -1°C	Brush bristles ice up; flow stops	IPA or glycol additive; keep brush moving
Hose freeze	Below -2°C	Ice plug forms in exposed hose run	Insulate hose; minimize hose length
Glass freeze before rinse	0°C to -3°C	Rinse water freezes before clearing	Work one pane at a time; apply, rinse immediately
Mineral deposit from freeze	Below 0°C	Dissolved solids concentrate as ice forms	DI water only; no tap water additives
Pump damage	Below -5°C	Pump housing or seals crack overnight	Drain system fully after use below -5°C

Operating Temperature Floor

The practical lower limit for WFP residential cleaning in Northern Ontario is approximately -10°C to -12°C ambient, depending on solution formulation and wind conditions. Below this range, solution management becomes too demanding to maintain quality results, and the risk of equipment damage increases significantly. Squeegee-based cleaning with appropriate cold-weather solution formulation extends the operational range somewhat, but requires more careful technique management.

SECTION 06

Cleaning Solution Selection and Freeze-Point Management

The cleaning solution used in cold-weather residential window cleaning must satisfy two competing requirements: it must remain fluid at operating temperature, and its residue must not compromise the spot-free finish that defines professional window cleaning quality. These requirements conflict because the additives that depress freeze point — alcohols and glycols — all contribute to streak and residue risk if not fully rinsed.

Freeze-Point Depressants: Comparison

Base	Freeze Point at 20%	Streak Risk	Safety	Recommended for Residential?
IPA (isopropanol)	-9°C	Moderate	Low toxicity	Yes, to -9°C
Methanol	-12°C	Low	WHMIS caution	With precautions only
Propylene glycol	-8.9°C	Low-Moderate	Food-safe (HC)	Yes — best choice
Ethylene glycol	-9.5°C	Low-Moderate	Toxic — avoid	No — pet/child risk
Ethanol	-8.7°C	Moderate	Low toxicity	Yes, to -8°C

Propylene glycol at 10–20% concentration is the recommended choice for residential cold-weather WFP cleaning in Northern Ontario. At 20% concentration, it provides a freeze point of approximately -8.9°C — adequate for the majority of spring cleaning conditions above -8°C ambient. It is classified as food-safe by Health Canada (approved for incidental food contact applications), eliminating the toxicity concerns associated with ethylene glycol.

Concentration Guidance by Temperature

Ambient Temp Range	PG Concentration	Freeze Point	Adequate Margin?	Notes
Above +2°C	0% (DI only)	-0.5°C	Yes (5+ °C)	No additive needed; optimal rinse quality
+2°C to -2°C	5% PG	-1.7°C	Marginal	Monitor hose runs; pre-warm solution
-2°C to -6°C	10% PG	-3.8°C	Adequate	Standard cold-weather mix; good performance
-6°C to -9°C	20% PG	-8.9°C	Adequate	Rinse thoroughly; higher viscosity noted
Below -9°C	Switch to methanol or IPA 30%	Below -20°C	Yes	PG insufficient; reassess whether to proceed

Hose Temperature Drop

On a -5°C day with 30°C solution in the tank, a 20-metre uninsulated hose can drop solution temperature to 18-20°C by the time it reaches the brush. Plan concentration based on hose-end temperature, not tank temperature. Insulate hose runs with foam pipe insulation and reduce hose length where possible.

TDS Discipline with Additives

Any additive to the WFP rinse water compromises the zero-TDS target that enables spot-free drying. In practice, this means the additive is used in the wash phase only, and the rinse is performed with the closest-to-zero-TDS water achievable. On systems with separate wash and rinse tanks, this is straightforward. On single-tank systems, the trade-off is accepted: a small amount of glycol residue will be left on the glass, which is visible only in very low concentrations and typically invisible at the 10-20% tank dilutions used for cold-weather cleaning.

SECTION 07

Ladder Safety and WSIB Compliance in Winter Conditions

Residential window cleaning frequently requires ladder use for second-storey and gable windows not reachable with a water-fed pole at ground level. In Northern Ontario winter and spring conditions, ladder safety involves risks not present in summer work: frozen ground, ice at the base of ladders, slick surfaces where solution has dripped, and reduced grip due to cold hands and gloves. The regulatory framework governing this work is clear and enforceable.

WSIB and O. Reg. 213/91

In Ontario, exterior residential cleaning work involving ladders falls under the Occupational Health and Safety Act (OHSA) and, where the work constitutes a construction project, Ontario Regulation 213/91 – Construction Projects. WSIB coverage is mandatory for anyone operating as a cleaning contractor in Ontario, including sole proprietors performing residential work. Homeowners employing unlicensed cleaners without WSIB coverage may assume liability for injuries sustained on their property.

Requirement	Reference	Key Rule
Ladder angle	O. Reg. 213/91 s.83	4:1 ratio – 1 metre out for every 4 metres of height
Ladder condition	O. Reg. 213/91 s.82	No broken rungs, rails, or hardware; inspect before each use
Ground stability	O. Reg. 213/91 s.84	Firm, level footing; use ladder levellers on frozen/uneven ground
Three-point contact	General duty clause	Two hands + one foot or two feet + one hand at all times
Carrying load	General duty clause	Never carry equipment that prevents three-point contact
Fall arrest	O. Reg. 213/91 s.26	Required when work platform height exceeds 3 metres
WSIB coverage	WSIB Act, O. Reg. 175/98	Mandatory for all Ontario cleaning contractors

Winter-Specific Ladder Hazards

- Ice at the ladder base: solution dripping from windows above the ladder foot can create a slick zone within minutes. Place a rubber mat or non-slip pad under the feet; inspect after every two windows.
- Frozen rungs: aluminum rungs retain cold and become slick when wet. Use rubber-dipped or non-slip rung covers; avoid bare hands on frozen aluminum.
- Reduced grip strength: at -5°C , grip force decreases by approximately 20% compared to 20°C . Use form-fitting insulated gloves rated for wet grip.
- Ground frost heave: in spring, frozen ground can shift mid-task as it thaws. Re-check ladder position and stability after any thaw-related movement.
- Extended reach: the temptation to over-reach increases in cold weather to minimize re-positioning. Apply the belt-buckle rule strictly — navel stays between the rails at all times.

WFP as a Ladder Alternative

The most effective way to manage ladder risk in cold weather is to minimize ladder use. A 65-foot water-fed pole system covers virtually all first and second-storey residential windows from ground level, eliminating the need for ladder access to all but the highest gable windows. Binx invests in WFP systems

SECTION 08

Seasonal Scheduling – Northern Ontario Cleaning Windows

Northern Ontario does not have a single 'window cleaning season' – it has several distinct operational windows, each with different risk profiles, equipment requirements, and customer demand patterns. Understanding this schedule allows homeowners and property managers to time cleaning for optimal results and minimum risk.

Period	Typical Dates (NB/Sud)	Avg Low	Conditions	Feasibility
Deep winter	Jan 15 – Feb 28	-18°C	Consistent below -10°C	Minimal – commercial WFP only in heated bays
Late winter	Mar 1 – Mar 20	-12°C	Freeze-thaw begins; variable	Marginal – assess daily; high IT risk
Spring transition	Mar 21 – Apr 20	-5°C	Prime cold-weather window	Viable with 5-variable assessment
Mid-spring	Apr 21 – May 15	+2°C	Low risk; peak demand	Optimal – standard technique applies
Summer	May 16 – Sep 15	+12°C	No cold-weather concerns	Optimal
Fall transition	Sep 16 – Nov 1	+3°C	Light freeze risk emerging	Largely viable; monitor overnight lows
Early winter	Nov 2 – Jan 14	-10°C	Regular below-zero; ice risk	Limited – WFP cold-weather protocols require

Booking Guidance for Homeowners

The highest-quality results – and the lowest risk – occur during mid-spring (late April through May) when ambient temperatures are consistently above +2°C, glass surfaces have warmed from overnight frost, and wind speeds are moderate. This is also peak demand for professional window cleaning in North Bay and Sudbury, so booking in March for an April or May appointment is advisable.

For clients who prefer a fall cleaning before winter sets in, the optimal window is late September to mid-October, when daytime highs are still reliable and overnight lows rarely drop below -2°C. Avoid scheduling for November and later – the risk of post-clean freeze events that leave residue on glass increases substantially.

The Post-Winter Grime Load

Northern Ontario winters deposit a specific combination of contaminants on glass: calcium chloride and sodium chloride from road treatment, mineral-rich snowmelt, and traffic exhaust particulate trapped by cold air inversions. This combination creates a harder-to-remove residue than summer dust and pollen,

SECTION 09

Field Protocols and Pre-Clean Checklist

The following checklist represents the pre-clean assessment protocol used by Binx crews on cold-weather residential cleaning days. It is designed to take under five minutes and to catch the conditions that most commonly lead to glass damage, poor results, or safety incidents in Northern Ontario spring cleaning.

Before Arriving On-Site

- ☐ Check Environment Canada forecast: temperature, wind speed, UV index for sun factor estimation
- ☐ Confirm no overnight low below -5°C for the 12 hours prior (glass may still be at overnight low)
- ☐ Mix cold-weather solution batch based on forecast low: PG 10% (-2 to -6°C), PG 20% (-6 to -9°C)
- ☐ Verify DI tank TDS < 10 ppm on meter (do not assume from last use)
- ☐ Inspect ladder feet, rung grips, and rail condition in good light before loading
- ☐ Load rubber non-slip mats for ladder foot placement on frozen surfaces

On-Site Assessment

- ☐ Check ambient temp with calibrated thermometer (not vehicle interior reading)
- ☐ Estimate wind speed: calm = < 10 km/h; breezy = $10-25$ km/h; windy = $25+$ km/h
- ☐ Assess each window face for sun exposure: direct sun, partial shade, or full shade
- ☐ Touch glass surface (back of bare hand) on the first window: confirm not iced
- ☐ Check solution temperature at hose end or brush before starting (not just tank)
- ☐ Run 5-variable assessment for most vulnerable glass type on property
- ☐ Inspect all visible edge seals for cracking, clouding, or existing damage
- ☐ Check base of each ladder placement point for ice or frost before ascending

During Cleaning

- Apply solution in small sections (≤ 30 cm strips), top to bottom
- Do not allow solution to pool at bottom rail or edge seal
- Rinse immediately after each strip — do not let solution sit on cold glass
- Monitor hose-end temperature every 30 minutes in sub-zero conditions
- Re-check ladder foot condition every two windows
- If glass audibly pops or stress cracking is seen: stop, document, notify client

After Cleaning

- Check all rinsed windows after 5–10 minutes for unexpected streaking (glycol residue indicator)
- Drain WFP system hose completely if ambient is below -5°C
- Document any pre-existing seal damage observed during cleaning
- Log site conditions (temp, wind, solution mix) for future reference

When to Stop and Reassess

If glass surface temperature drops unexpectedly during the job (overcast moves in, wind picks up), stop and re-run the 5-variable assessment before continuing. Conditions in Northern Ontario spring can shift quickly, and what started as LOW risk can move to HIGH within an hour of weather change.

SECTION 10

Regulation Crosswalk and Standards Reference

The following table maps the key regulatory and standards frameworks applicable to cold-weather residential window cleaning in Ontario. This crosswalk is provided for reference — always consult current versions of regulations, as amendments occur without notice in this field.

Standard / Regulation	Jurisdiction	Relevance to Cold-Weather Window Cleaning
OHSA (R.S.O. 1990, c. O.1)	Ontario	Governing act for all workplace safety; duty of care for contractors
O. Reg. 213/91 (Construction Projects)	Ontario	Ladder safety, fall protection, ground stability requirements
O. Reg. 67/93 (Industrial)	Ontario	Applies to commercial window cleaning operations
CSA Z259.1	Canada	Body harnesses and lanyards for fall arrest
CSA Z259.16	Canada	Fall protection design of structures — applies to fixed anchor points
Health Canada Schedule F	Canada	Propylene glycol classification — food-safe for residential use
WHMIS 2015	Canada	Methanol and other cleaning chemical hazard communication
ISO 11479	International	Glass in buildings — determination of bending strength
ASTM C1036	USA/adopted CA	Standard specification for flat glass — relevant to type identification
ASTM E774	USA/adopted CA	Sealed insulating glass units — performance classification and edge seal
ENERGY STAR Canada (NRCAN)	Canada	Low-E window specifications — performance ratings and U-factor claims
NFRC 100	USA/adopted CA	Procedure for determining fenestration product U-factors — used by most Canada

Key Definitions for Field Reference

Term	Definition
ΔT (Delta-T)	Temperature differential between cleaning solution and glass surface at point of contact, in °C
Thermal shock	Rapid temperature change causing differential thermal expansion sufficient to initiate or propagate a s
TDS (Total Dissolved Solids)	Concentration of dissolved minerals in water, measured in ppm; target < 10 ppm for spot-free WFP resu
IGU	Insulated Glass Unit — two or more glass panes separated by a sealed spacer and gas fill
Low-E	Low-emissivity coating — metallic or ceramic oxide film that reduces infrared heat transfer through gla
WFP	Water-Fed Pole — telescoping pole delivering purified water to a brush for cleaning glass from ground l
Freeze-point depression	Reduction in the freezing point of water caused by dissolved substances (alcohols, glycols)
Min safe surface temp	Minimum glass surface temperature at which cleaning is safe; below this, edge seal and glass stress risk

For technical questions about residential window cleaning in North Bay or Sudbury, contact Binx Professional Cleaning at binx.ca/residential-windows.php. The full dataset and calculator supporting this guide are available at https://github.com/veronica_caledon/residential-window-cleaning-2026.

ABOUT BINX

Why Clients Trust Binx Professional Cleaning

\$ \$5M Liability Insurance	W WSIB Full Coverage	Q Quality Audit Verified	G 100% Green Certified
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Binx Professional Cleaning is a locally owned and operated cleaning company serving North Bay, Sudbury, and surrounding communities in Northern Ontario. With 70+ trained cleaning professionals, we deliver consistent, verified, and insured cleaning services to over 200 commercial and residential clients every week.

We are proud partners of Cleaning for a Reason, providing free cleaning services to cancer patients in our community. We use 100% green-certified Green Cleaning Chemical products across every account. Every cleaning visit is verified through our Quality Audit inspection platform – so you never have to wonder whether the work was done.



Book Your Spring Window Cleaning

Binx Professional Cleaning serves residential and commercial clients across North Bay, Sudbury, and Northern Ontario.

Contact us for a free, no-obligation quote.

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