Comparative Testing of *Clarvista*® Shower Glass to Competing Coated and Uncoated Shower Glasses

Abstract

Clarvista® shower glass demonstrated exceptional durability and clarity retention under rigorous performance testing developed by Vitro Architectural Glass. Comparative testing showed that *Clarvista*® glass outperformed uncoated and competitive coated glass in resisting corrosion, maintaining clarity and withstanding environmental wear. Its performance highlights the advantages of its fused protective coating, providing superior long-term results in both clear and ultra-clear glass substrates. Restoring its brilliance is easy. Non-abrasive, off-the-shelf cleaners can be used on *Clarvista*® glass without diminishing or damaging its protection.

"...in comparative testing with the leading competitive coated shower glass products, Clarvista® glass was equal to or superior in durability, clarity retention and corrosion resistance. Identical testing of uncoated shower glass products generated significant signs of corrosion."

Introduction

Introduced by Vitro Architectural Glass in 2009, *Clarvista*® glass is specifically designed for shower doors and enclosures. *Clarvista*® glass's proprietary coating is fused to the glass during manufacturing, creating a durable barrier against the corrosive effects of heat, humidity and household chemicals. By maintaining the pristine appearance of glass surfaces for extended periods, it ensures shower enclosures look newer, longer, with less maintenance. To restore its brilliance, non-abrasive, off-the-shelf cleaners can be used on *Clarvista*® glass without diminishing or damaging its protection. For best results, a squeegee is recommended after every use.

Clarvista® glass is available in a standard clear glass substrate as well as the ultra-transparent *Starphire Ultra-Clear*® glass substrate. Both options provide premium performance while meeting the expectations of modern shower and bath environments.

This white paper examines *Clarvista*® glass's performance via internal Vitro testing and comparisons to both uncoated and leading coated glass products.

Testing Parameters

There are no universal industry-standard tests specifically for coated shower enclosure glass. To bridge this gap, Vitro developed thorough performance benchmarks simulating real-world bathroom environments. These tests assessed the following factors:

1. **Heat and Humidity** — Resistance simulating conditions within a typical bath or shower enclosure.
2. **Mechanical Durability** — Evaluating the interplay between physical wear and environmental exposure.
3. **Chemical Durability** — Assessing the impact of household cleaning solutions.

Products tested included *Clarvista*® clear glass, *Starphire Ultra-Clear*® glass, uncoated clear glass and a leading competitor's coated glass. All products were tempered to accurately reflect real-world installations.

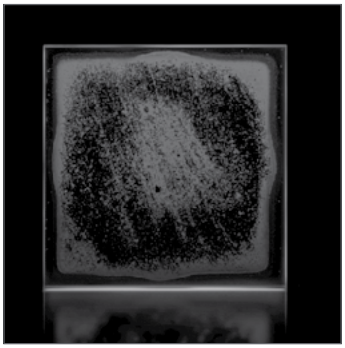
Methodology and Results

Vitro Glass Accelerated Aging Chamber Test

To replicate years of environmental exposure, Vitro developed an advanced high-temperature, high-humidity test environment known as the "jungle box." Samples were exposed to 1,000 hours of continuous conditions at 140°F, 90% relative humidity and with a minimum 7.0 pH factor.

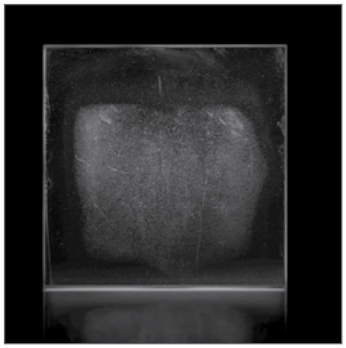
Results

Uncoated clear glass



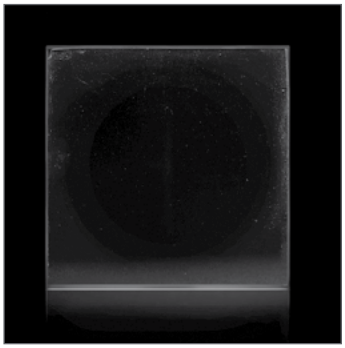
Uncoated clear glass began showing significant haze[1] and corrosion after 175 hours.

Leading competitive coated shower glass



The competitor's coated glass showed reduced clarity with measurable haze at 12%.

Clarvista® glass



Clarvista® glass exhibited less than 1% haze and no visible corrosion.

Common Glass Industry Tests

Tests Performed:

- Cleveland Condensation Test (ASTM D4585): Heat and water exposure.
- Salt Fog Test (ASTM B117): Resistance to corrosive environmental conditions.
- Taber Abrasion Test (ASTM D1044): Physical durability under abrasive conditions.
- pH Testing (ASTM D-5146): Impact of chemical exposure from cleaning products.

Key Findings:

- *Clarvista*® glass repeatedly achieved less than 1% post-test haze.
- Comparative products showed deterioration ranging from 6% to 80%, depending on the testing environment.

Testing Reference Chart

Property Tested	Tests Performed	Relevant Details
Hot/Humid Environment*	Vitro Glass Accelerated Aging Chamber	140˚F / 90% RH Glass packs w/acrylic beads
	Cleveland Condensation	140˚F / 95% RH
	Salt Fog	95˚F / 5 ^{wt} % salt spray
Mechanical Durability**	Taber Abrasion	10 cycles / 500g weight
Chemical Durability**	Cleaning Agents	24 hr. soak, then 10 wipes
	Industrial Chemicals	Tests chemical dependent

** Exposed 1,000 hours **Followed by 1,000 hours exposure in Vitro Glass Accelerated Aging Chamber*

[1] Haze is a scientific measure of glass clarity. The lower the haze measure, the clearer the glass appears.

Cleveland Condensation Test (ASTM D4585): Heat and water exposure.

Purpose:

This test examines the ability of glass to resist damage from continuous exposure to condensation by exposing one side of a sample to a heated, saturated mix of air and water vapor. The reverse side is exposed to air at room temperature. The performance of the glass is measured by the effects condensation has on color change, blistering, loss of adhesion and softening or hardening of the glass and/or coating.

After testing in the Cleveland Condensation chamber, uncoated clear glass had a hazing reading of less than 1%.

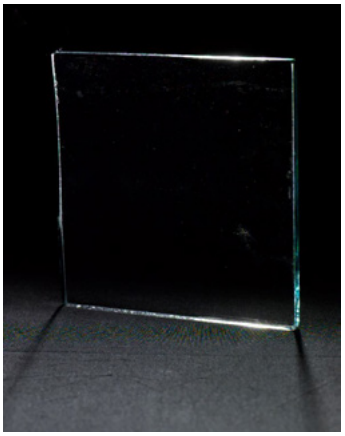
The leading competitive coated clear glass had a haze reading of 1%.

The haze reading for *Clarvista*® glass in a clear glass substrate was less than 1% after Cleveland Condensation testing.

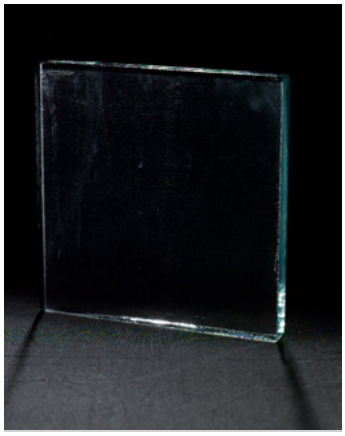
Salt Fog Test (ASTM B117): Resistance to corrosive environmental conditions.

Purpose:

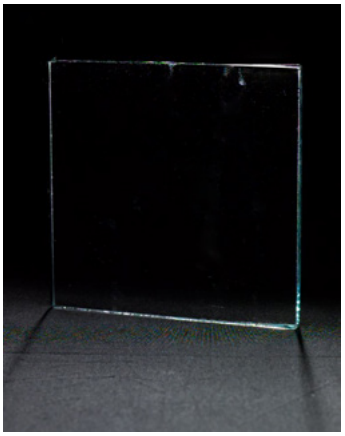
Salt fog testing takes place in a closed chamber where glass samples are exposed to a 5% sodium chloride (salt) mist for 1,000 hours at a minimum temperature of 95°F. The performance of the glass/coating is measured by its ability to resist the chamber's corrosive environment.



After salt fog exposure, uncoated clear glass had a haze reading of 1%.



After salt fog testing, the leading competitive coated clear glass had a haze reading of 2%.



After salt fog testing, *Clarvista*® glass in a clear glass substrate had a haze reading of 1%.

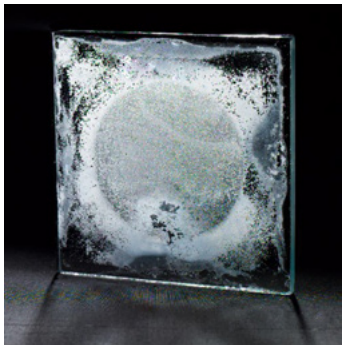
Taber Abrasion Test (ASTM D1044): Physical durability under abrasive conditions.

Purpose:

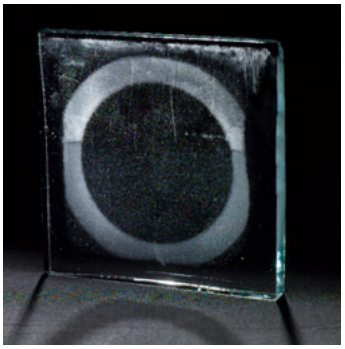
In the Taber abrasion test, two rollers covered with gritted paper are rotated over the surface of the glass/coating with varying levels of pressure to simulate the physical effects of abrasion. This is immediately followed by 1,000 hours of exposure in the Vitro Glass Accelerated Aging Chamber.

The purpose of this test is two-fold: First, to gauge the susceptibility of the glass surface to scratches during handling and fabrication and, second, to assess its ability to withstand the repeated mechanical action of cleaning in the home shower environment.

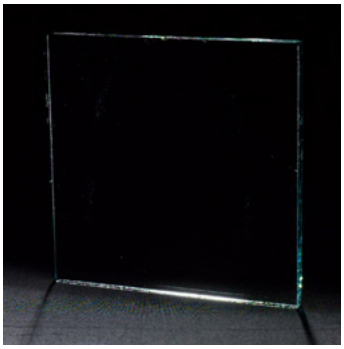
The performance of the glass/coating is measured by its ability to resist surface wear and maintain its appearance and protective properties.



Taber/Accelerated Aging Chamber testing of uncoated clear glass produced a haze measurement of 83%.



On the leading competitive coated clear glass the Taber/Accelerated Aging Chamber test produced a haze reading of 42%.



Clarvista® glass in a clear glass substrate had a haze reading of less than 1% after Taber/Accelerated Aging Chamber.

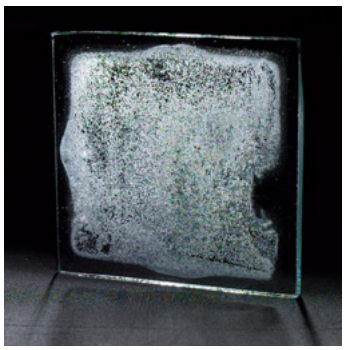
pH Testing (ASTM D-5146): Impact of chemical exposure from cleaning products.

Purpose:

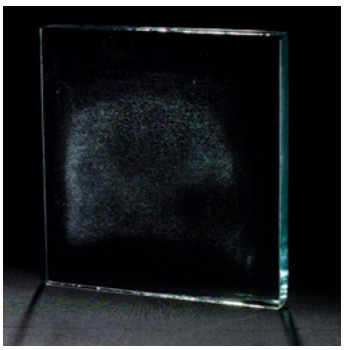
For pH testing, each glass sample is cleaned with a paper wipe 10 times after 24-hour immersion in the selected cleaning product/formula. After pH testing, the samples are further exposed to 1,000 hours of heat and humidity in the Vitro Glass Accelerated Aging Chamber. The purpose of the test is to gauge the effects of repeated chemical exposure from cleaning in the home shower environment. Vitro Glass tested more than a dozen common household cleaning products/formulas with pH factors ranging from 0.9 to 12.6. The following photographs show results from four cleaning products:

- Calcium-Lime Rust Remover
- Ammonia-Based Glass Cleaner
- Bath/Shower Stain Remover

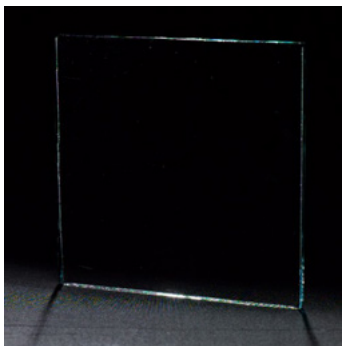
Calcium-Lime Rust Remover



pH/Accelerated Aging Chamber testing with calcium-lime rust remover produced a haze reading of 58% on uncoated clear glass.

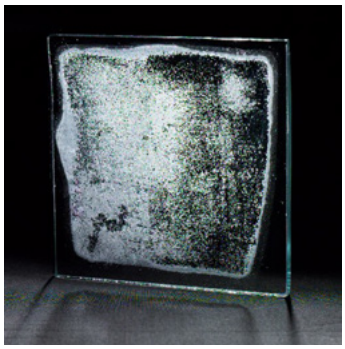


On the leading competitive coated clear glass, pH/Accelerated Aging Chamber testing with calcium-lime rust remover produced a haze reading of 6%.

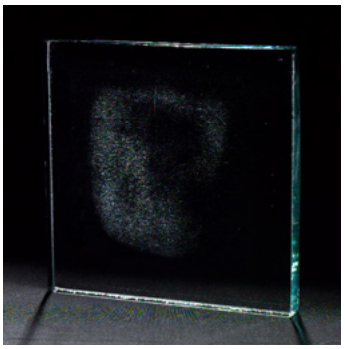


After pH/Accelerated Aging Chamber testing with a calcium-lime rust remover, *Clarvista*® glass in a clear glass substrate had a haze reading of less than 1%.

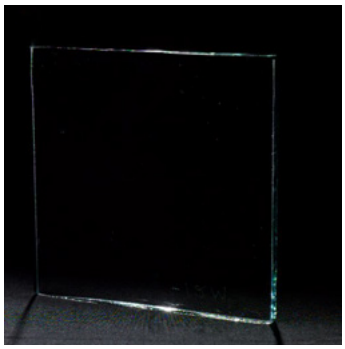
Ammonia-Based Glass Cleaner



pH/Accelerated Aging Chamber testing with the ammonia-based glass cleaner created a haze reading of 87% on uncoated clear glass.

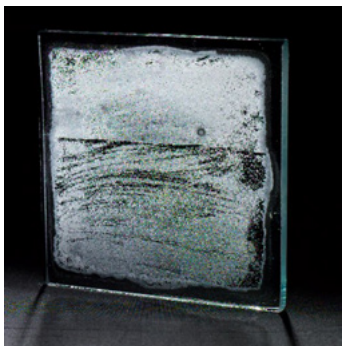


The leading competitive coated clear glass sample had a haze reading of 3% after pH/Accelerated Aging Chamber testing with the ammonia-based glass cleaner.

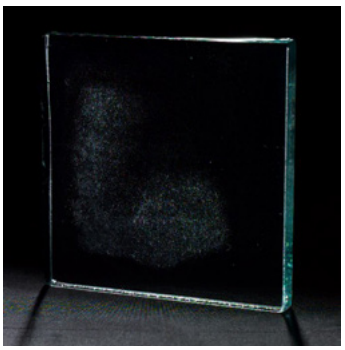


The haze reading for *Clarvista*® glass in a clear glass substrate was less than 1% after pH/Accelerated Aging Chamber testing with the ammonia-based glass cleaner.

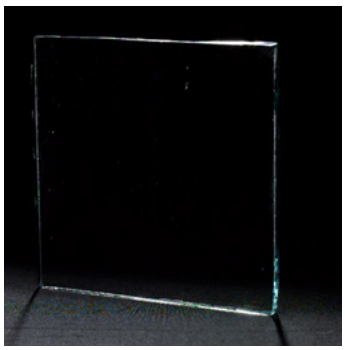
Bath/Shower Stain Remover



pH/Accelerated Aging Chamber with the bath/shower stain remover produced a haze reading of 70% for uncoated clear glass.



pH/Accelerated Aging Chamber testing with the bath/shower stain remover resulted in a haze reading of 4% for the leading competitive coated clear glass.



The haze reading for *Clarvista*® glass in a clear glass substrate after pH/Accelerated Aging Chamber testing with the bath/shower stain remover was less than 1%.

Product	Heat/Humidity ONLY (Vitro Glass Accelerated Aging Chamber)	Scratched + Heat/Humidity	Harsh Cleaner + Heat/Humidity
Clarvista® Glass	■	■	■
Competitor's Coated Bath/ Shower Glass	■	■	■
Uncoated Glass	■	■	■

KEY: ■ = No Corrosion ■ = Moderate Corrosion ■ = Severe Corrosion

Clarvista® Glass on Multiple Substrates

On Clear Glass by Vitro

Clarvista® glass enhances conventional clear glass, extending its clarity and resistance to corrosion for long-lasting beauty.

On *Starphire Ultra-Clear*® Glass

The superior transparency of *Starphire Ultra-Clear*® glass is perfectly preserved by *Clarvista*® glass's protective coating, maintaining its highly sought-after brilliance.

On Acid-Etched Glass

Clarvista® glass can also be applied to acid-etched glass surfaces to create privacy while retaining durability and an elegant satin finish.

Summary

Test data demonstrates that coated shower glasses offer consistently better performance and a longer service life than uncoated products.

Testing also reveals that the manufacturing method employed on *Clarvista*® glass enables it to maintain clarity and resist corrosion longer than the leading competitive coated shower glasses. As a consequence, consumers can expect *Clarvista*® glass to retain its original clarity longer than leading competitive products in a true shower environment.

Conclusions

1. *Clarvista*® glass provides a superior alternative to both uncoated and competitive coated glass, delivering unmatched clarity retention and corrosion resistance.
2. Its fused coating requires no special furnace modifications during tempering, making it an effortless choice for fabricators.
3. Proven through rigorous testing, *Clarvista*® glass is well-suited to high-humidity environments, maintaining its pristine appearance with minimal maintenance. Simple cleaning with non-abrasive, off-the-shelf cleaners quickly restores its clarity, reinforcing the long-term value of the coating

By specifying *Clarvista*® glass, projects benefit from materials that maintain their value, preserve client satisfaction and stand the test of time.

Note to Fabricators

Clarvista® glass is ready for immediate use. It does not require heat treatment to activate its high-performing properties. As a point of departure, the standard furnace heat cycle for the same uncoated glass thickness and substrate is recommended.

Clarvista® glass is available in 6mm, 10mm and 12mm thicknesses in both clear and *Starphire Ultra-Clear*® substrates.

For more information, call 1.855.887.6457 / 1.855.VTRO.GLS, or visit ClarvistaGlass.com.

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