- 26 Year of testing experience
- Over 2800 projects tested
- 6 laboratories across Asia
- Accredited in 4 countries

WINWALL TECHNOLOGY INDIA PVT LTD

CONTENTS

INTRODUCTION

As India takes its place among the developed nations, there is a need to build larger, better and complicated structures to accommodate the growing demand for corporates, hotels, airports, hospitals and residential apartments, which arise as a result of such development.

To cater to this demand of premium space architects, consultants, developers etc., are bringing the latest technology from world over to build bigger, taller and more complicated structures.

To ensure that these complex structures are safely clad with the right materials, energy efficient and perform to established standards, it is important that facade systems are tested before they are installed.

ABOUT WINWALL INDIA

Winwall Technology India Private Limited (**WTIPL**) is a **ISO 17025 NABL** Accredited laboratory established to conduct performance testing on aluminium curtain wall facades, windows, doors, handrails and also them as per the standards. **WTIPL** is a joint venture set up by Winwall Technology Pte Ltd, Singapore one of South East Asia's oldest and respected facade testing labs with over 26 years of experience in this field. It caters to the growing market in India and Srilanka.

WINWALL HAS ITS TESTING LABS IN

- Singapore
- Kualalumpur
- Johor Baru
- Ho chin min
- Manila
- Chennai

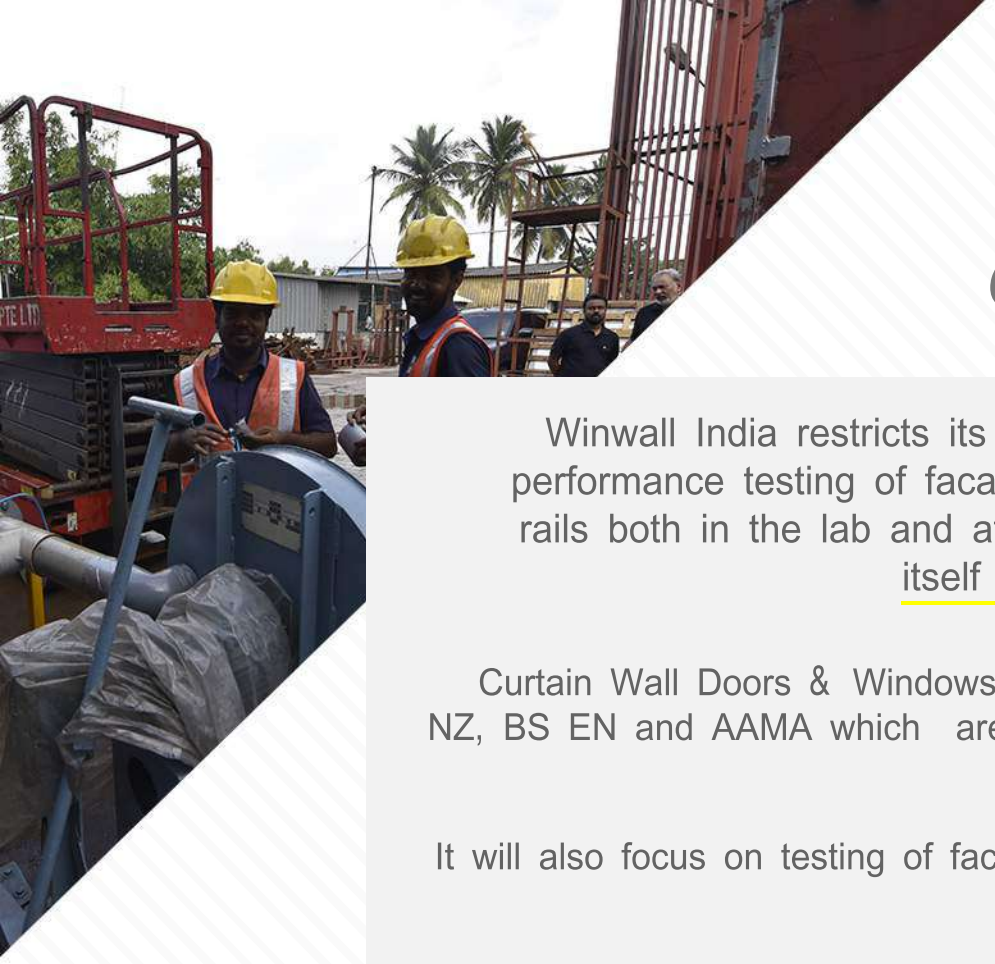
THE IMPORTANCE OF FACADE TESTING

Windows and curtain walls generally represent as much as 50% to 100% of the exterior cladding of large buildings and they are the determining elements in the performance of the vertical building envelope. They also form a critical and important architectural feature of a building and represent a significant portion of the overall cost.

Modern buildings today are required to be not just aesthetically pleasing but also function to a very high performance standards. The facades act effectively as a barrier between the external and internal environments. Failure of the facades to meet the standards results in heavy energy wastage due to un-controlled leaks of air-conditioning, damages to the interior furniture due to water leaks and in some cases even loss of life and property arising out of structural failures of the facade during cyclonic storms.

Thus the primary reasons for testing of curtain walls, windows and doors are as follows

- ☑ Ensure safety of the public and the occupants of the building
- ☑ Validate and evaluate design of facade
- ☑ Check for fabrication errors
- ☑ Rectify all faults before final production
- ☑ Save cost and time
- ☑ Ensure a Quality Facade



SCOPE OF ACTIVITIES

Winwall India restricts its scope of activity to conducting performance testing of facades, doors, windows and hand rails both in the lab and at the site and does not involve itself in consulting or facade design.

Curtain Wall Doors & Windows are tested as per ASTM, AS NZ, BS EN and AAMA which are the most common standards used the world over.

It will also focus on testing of facade for fire restistance as per NFPA 285

Winwall will offer both testing at the lab to check and validate the design of a facade (offsite) and field testing to check consistency of fabrication and installation (onsite).

CURTAIN WALLS / DOORS & WINDOWS

- Air Infiltration and Exfiltration (ASTM E331, AS/NZS 4284 and BS EN 12153)
- Dynamic Water Penetration (AAMA 501.1)
- Structural Performance (ASTM E330, AS/NZS 4284 and BS EN 12179)
- Lateral Movement (Seismic Test) (AAMA 501.4 and AS/NZS 4284)
- Thermal Cycling / Condensation Analysis (AAMA 501.5)
- Controlled Dismantle
- Static Water Penetration (ASTM E283, AS/NZS 4284 and BS EN 12155)
- Cyclic Water Penetration (ASTM E547 and AS/NZS 4284)
- Proof Load (ASTM E330 and AS/NZS 4284)
- Building Maintenance Unit Load (BMU) (AS/NZS 4284)
- Impact Resistance (BS 8200 / BS EN 13049)

SCOPE OF ACTIVITIES

HANDRAIL & BALUSTRADE SYSTEMS

- Balustrade performance (ASTM E2353 / ASTM E935)
- Anchorages (ASTM E894)

GLASS TESTING

Heat strengthen and toughened as per IS 2553-1 &3, IS 14900, IS 16982, IS 6503, IS 14900, IS 17346, IS 17004

FIRE PROPAGATION

- As per standard NFPA 285
- As per standard IS 18190

WINDOWS AND DOORS

Hardware life cycle testing as per BS EN 13115:2020, BS EN 12400:2002, BS EN 13126-5:2011+A1:2014, BS EN 13126-6:2018

CERTIFICATION OF SYSTEMS as per BS EN Standards.

TEST METHODOLOGIES

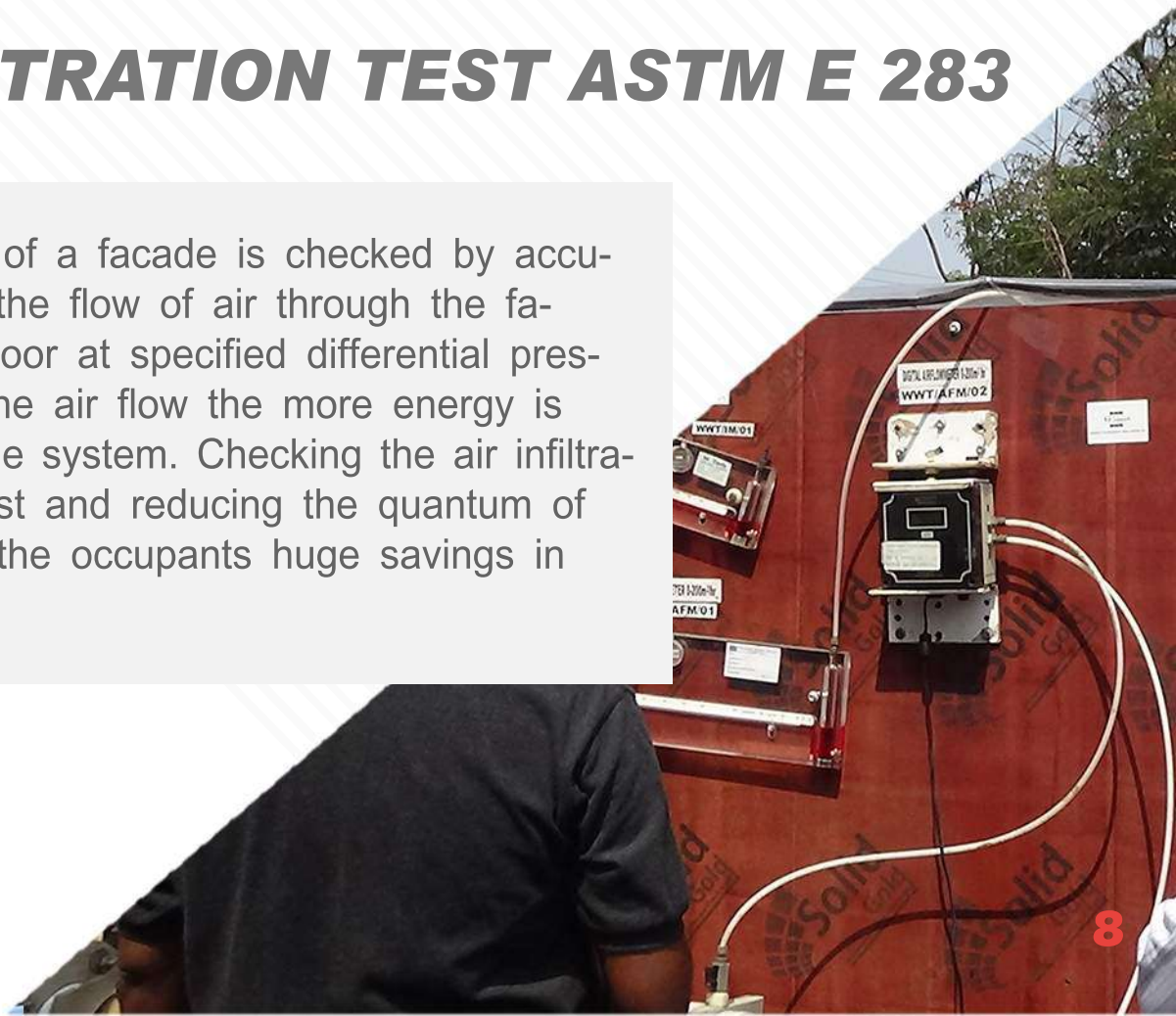
The glass curtain walls sample must incorporate all the essential components which are part of the end product, These includes - aluminium profiles, glass panels, hardware, gaskets, sealants, fastners and any other elements.

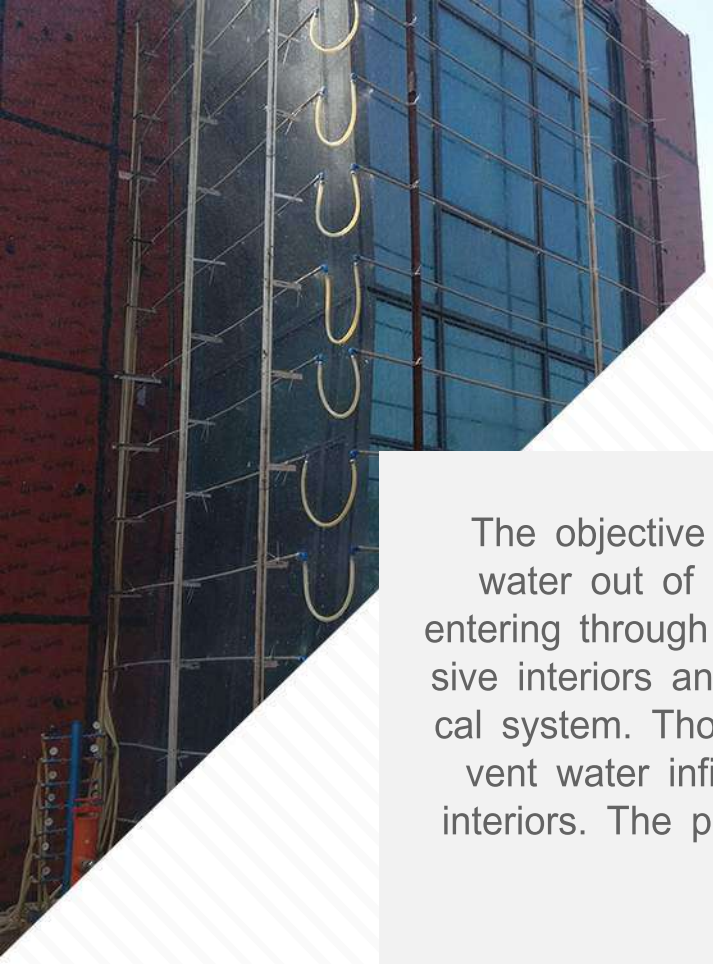
The performance mockup sample should be at least three glass bays wide as to incorporate a central bay and all the junction details and a minimum of two floors high.

The height of the performance mockup sample should include at least one expansion or stack joint, one spandrel section, one vision section and openable sash with all the necessary hardware.

AIR INFILTRATION TEST ASTM E 283

Energy efficiency of a facade is checked by accurately measuring the flow of air through the facade/window or door at specified differential pressure. The more the air flow the more energy is leaking through the system. Checking the air infiltration during the test and reducing the quantum of air leak will give the occupants huge savings in cooling costs.



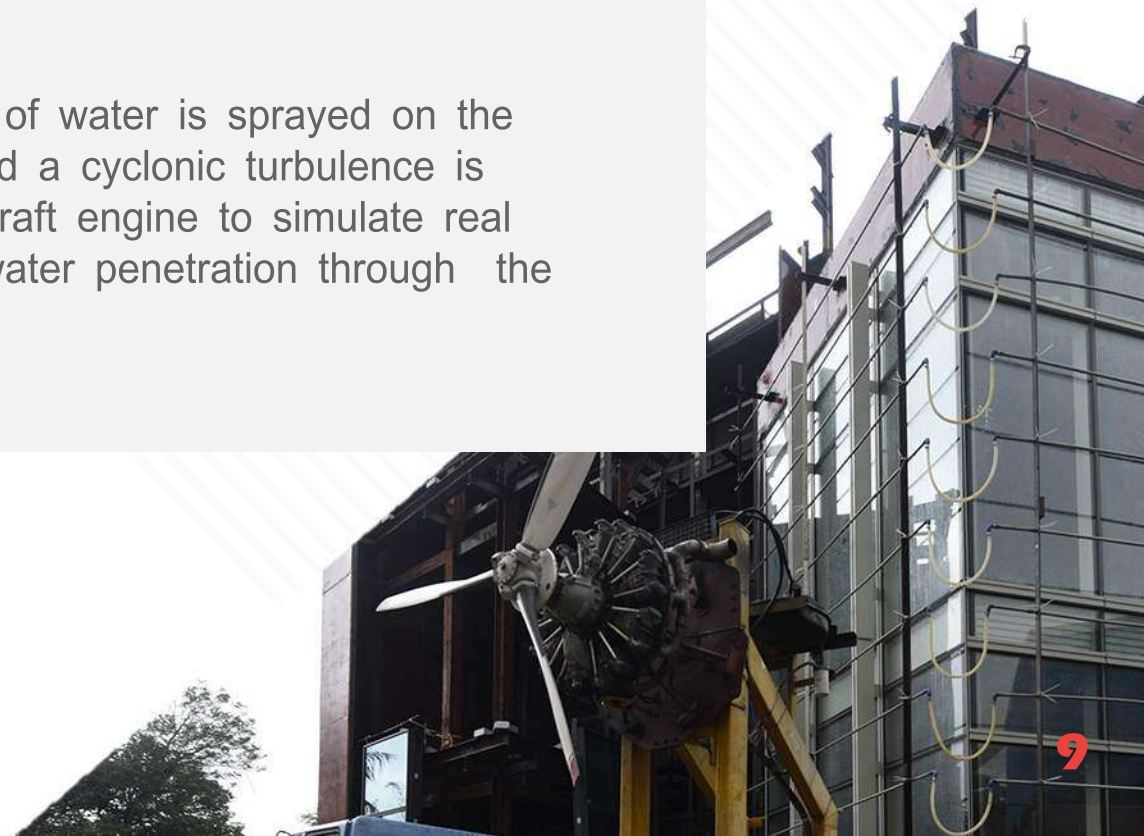


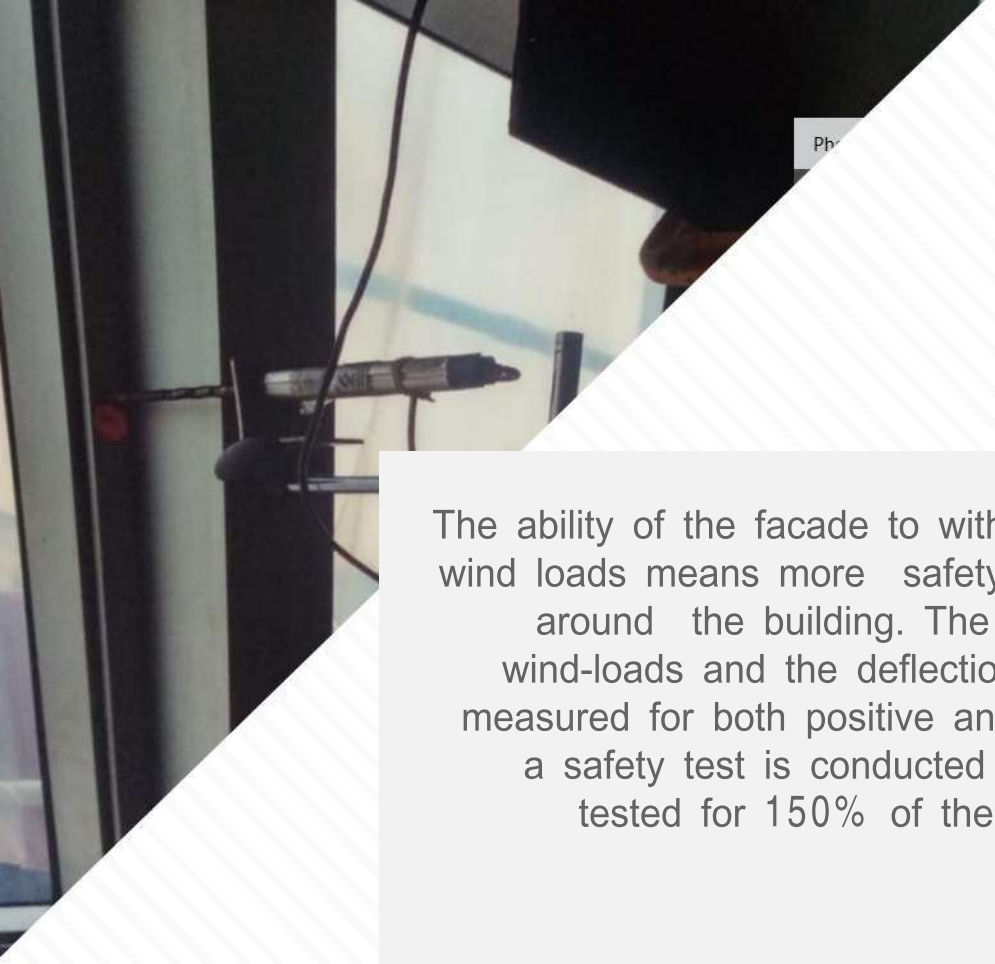
STATIC WATER PENETRATION TEST ASTM E 331

The objective of a well designed facade is to keep the rain water out of the building even during severe storms. Water entering through the curtain wall damages false ceiling, expensive interiors and also can lead to short circuits in the electrical system. Thorough evaluation of the facade system to prevent water infilteration means no damage to furnishings and interiors. The pass criteria is clear - no water leak on the interior surface during the test.

DYNAMIC WATER PENETRATION TEST AAMA 501.2

The same quantum of water is sprayed on the mock up sample and a cyclonic turbulence is created using a aircraft engine to simulate real life conditions. No water penetration through the sample is allowed.



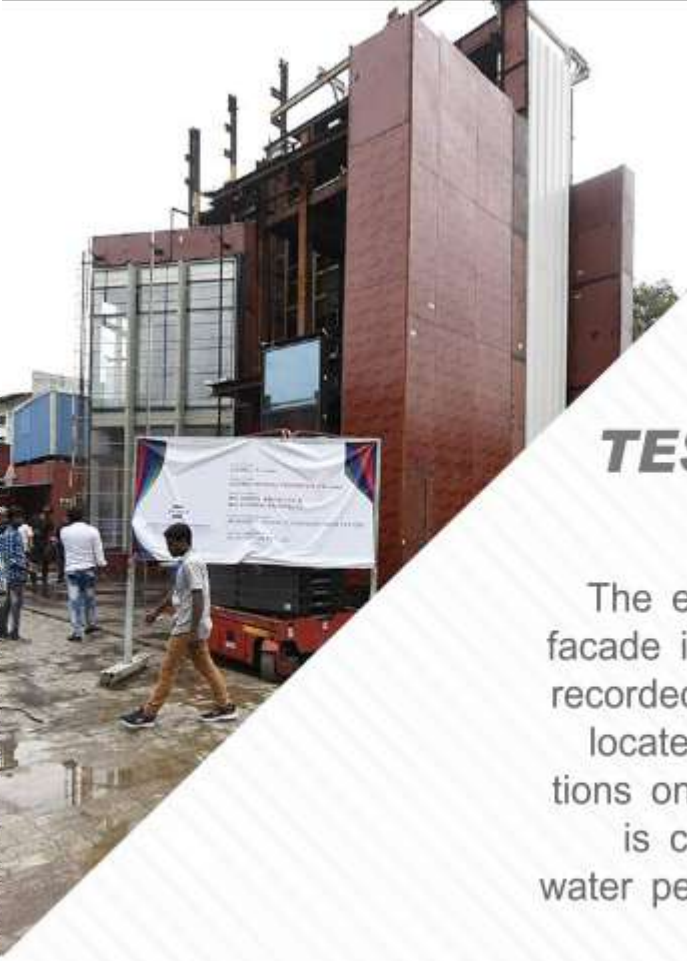


STRUCTURAL PERFORMANCE TEST ASTM E 330

The ability of the facade to withstand the onslaught of severe wind loads means more safety for the occupants and others around the building. The facade is tested for maximum wind-loads and the deflections of all critical elements are measured for both positive an negative pressure. Further on a safety test is conducted where the mock up sample is tested for 150% of the design load both positive and negative pressure.

LATERAL MOVEMENT (SEISMIC TEST) AS/NZ 4284

Since the facade is a continuous glazing and the brackets are fixed outside the RCC slab, a seismic test is done to check the ability of the facade to accomodate the interstory drift which happens due to the impact of windloads on the building structure.



THERMAL CYCLING AND CONDENSATION

TEST AAMA 501.5/ AAMA 1503

The effects of extreme cold and hot weather on the facade is tested by simulating the lowest and highest recorded temperature in the zone where the project is located. The impact of such extreme weather conditions on the aluminium profiles, gaskets and sealings is checked by a repeat of air infiltration and static water penetration test. This test can also help in verifying creates any condensation on the glass panels.

National Accreditation Board for Testing and Calibration Laboratories

NABL

CERTIFICATE OF ACCREDITATION

WINWALL TECHNOLOGY INDIA PRIVATE LIMITED

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

NO.567-A, S R KANDIGAI ROAD, GUMMIDIPOONDI, CHENNAI, THIRUVALLUR, TAMIL NADU, INDIA

in the field of

TESTING

Certificate Number: TC-7687

Issue Date: 22/09/2023 Valid Until: 21/09/2025

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: Winwall Technology India Private Limited

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

ONSITE TESTING (FIELD TESTING)

CURTAIN WALLS AND SKYLIGHTS

On-Site Testing as per AAMA 501.2, ASTM E 1105

DOORS & WINDOWS

On-Site Testing as per ASTM E 1105

Once the mock up sample installed at the lab has been tested and it passes all the laid down specification the design of the system stands validated. However in order to ensure that the workmanship and the installation procedures are strictly adhered to by the contractor, an onsite water pentration test is conducted as per AAMA 501.2 for curtain walls and as per ASTM E 1105 for sliding doors.

This test is done on 1 to 5% of the glazed area in stages as the installation process begins at site. By using in an independent testing agency to conduct a water test at site on random locations during installation the building owner can ensure that the recommended fabrication and installation process is adhered to by the facade contractor. Conducting this during the early stages of installation any shortcomings which may have crept in either knowingly or unknowingly subsequent stages of installation.

It is important for all parties involved in this process to realize that even though performance testing is not mandatory, doing a test eliminates the smallest possibility of failure in the facade thus preventing loss to property and human life.

PROJECTS TESTED

Winwall has undertaken over 2,000 important projects, including:

- KUALA LUMPUR INTERNATIONAL AIRPORT - MALAYSIA
- BANK OF CHINA - CHINA
- WORLD TRADE CENTRE - CHINA
- CHANGI AIRPORT TERMINAL 3 - SINGAPORE
- KUALA LUMPUR SENTRAL - MALAYSIA
- SHARJAH INTERNATIONAL AIRPORT - OMAN
- MARINA BAY FINANCIAL CENTRE - SINGAPORE
- DUBAI TOWER - QATAR
- MARINA BAY SANDS IR - SINGAPORE
- INTEL SOFTWARE CENTRE - INDIA
- RELIANCE TWIN TOWER - INDIA
- AMAZON DEVELOPMENT CENTRE - INDIA
- ORACLE CAMPUS - INDIA
- MARINA COMM 18 - QATAR
- THAI AIRWAYS SIMULATOR & OFFICE - THAILAND
- STOCK EXCHANGE BUILDING - JAKARTA
- BANK INDONESIA TOWER - JAKARTA
- CYBER PORT HOTEL - HONG KONG
- SAIGON PEARL - VIETNAM
- THE LANDMARK - HONG KONG
- CENTRAL WORLD TOWER - BANGKOK
- GERMAN TRADE CENTRE - JAKARTA
- STOCK EXCHANGE - THAILAND
- RAFFLES SQUARE - SHANGHAI
- CANTHO AIRPORT - VIETNAM
- DA NANG INTERNATIONAL AIRPORT - tVIETNAM
- JURONG ISLAND - SINGAPORE

SAFE FACADES
SAFER WORLD

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