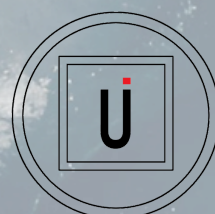




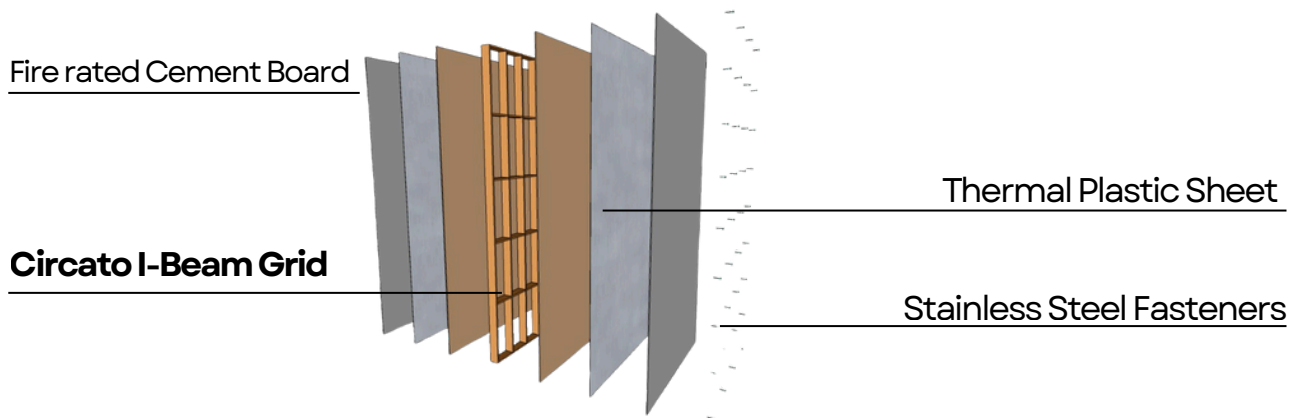
# CIRCATO

TESTING REPORTS



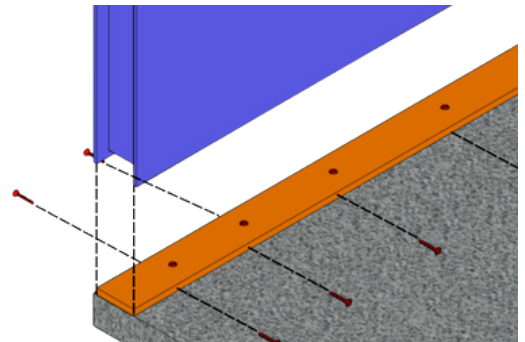
UNIFIED INTELLIGENCE  
PVT. LTD

# HONEYCOMB INSPIRED I-BEAM CONSTRUCTION

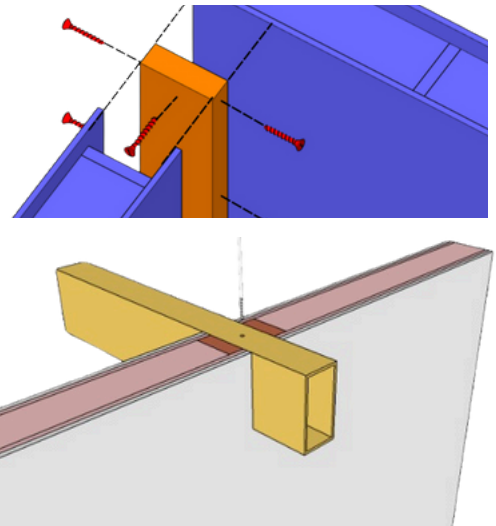


## PLUG-AND-PLAY, INSTALLATION.

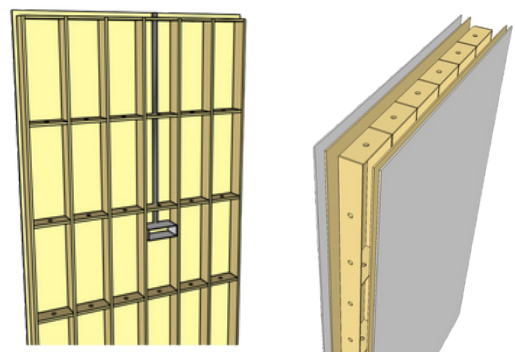
- 1 Runners installation :** Runners Installation: Thermal sheet-based runners are precisely positioned according to the markings and then securely anchor bolted to the platform. This ensures stability and alignment, providing a strong foundation for the subsequent construction phases.



- 2 Wall Panels and Steel Hotspots Installation:** Grooves are integrated into the thermal panels, enabling them to slide or fit securely over the runners. These panels are then sealed with a high-quality adhesive and permanently secured using stainless steel fasteners. Steel hotspots are inserted, providing ready support for steel beams. This ensures a robust and reliable structure, ideal for various construction needs.



- 3 Electrical, Plumbing & Finishing:** Electrical conduits and plumbing lines can either be pre-installed at the factory or cut out on-site. The cement fibre board is then adhered using a high-quality adhesive and permanently secured with headless nails. This method ensures a seamless and durable finish, ready for any further aesthetic treatments.



# TECHNICAL SPECIFICATIONS

## CIRCATO CONSTRUCTION PANELS

Particulars	Nos   Details	Description
<b>Size</b>	8' x 4' x 4" (32' Sqft)	Our panels are manufactured in standardized dimensions and undergo processing to create a variety of assembly-ready panels.
<b>Sandwich construction</b>	5 Layers	Layer 1 : Fire Rated Cement fiber Board , Layer 2 : Thermal Sheet, Layer 3 : I-Beam Grid , Layer 4 : Thermal Sheet, Layer 5 : Fire Rated Cement Fiber Board
<b>Installation Method</b>	SIP Modular Techniques	Panels are assembled using male-to-female joineries, securely fastened, reinforced, and sealed with adhesive sealants for durability.
<b>Panel Density</b>	269 kg/m <sup>3</sup>	The panel weighs between 77-80 kg, excluding Layers 1 and 5.
<b>Thermal Conductivity</b>	0.04W/m.K	Circato is 37.5 Times more resistant to heat flow per meter than concrete.
<b>U-Value</b>	0.4W/m <sup>2</sup> .K	Circato Loses heat 19 times Slower than concrete (R = Thickness / k)
<b>R-Value</b>	0.13m <sup>2</sup> -K/W	Circato resists heat 19 times better than concrete (U=1/R)
<b>Sound Absorption</b>	> 38dBA	Due to the mass and well-constructed nature, significant isolation results are achieved.
<b>Fasteners</b>	304/316	Stainless Steel Fastners
<b>Compression Load</b>	10.9MPa	Sample tested in Cement Block Size. Max Load Applied 109.2(kN)
<b>Water Absorption</b>	0.40%	Water immersion for 24hrs. As per ASTM D570:2022
<b>Burn rate of Thermal Sheet</b>	45mm/Min	The horizontal burn rate is considered satisfactory if, burn rate is 100mm or less/ Min.
<b>ROHS</b>	Comply within the limits set by RoHS Directive (EU) 2015/863 amending Annex II to directive 2011/65/EU	
<b>Boiling Water Test</b>	Satisfactory	72Hrs Immersion, No effect
<b>Melting Point of Thermal Sheet</b>	130DegC	ISO:3146
<b>Screw Holding Capacity</b>	51.2	1/8" Self Threaded Screw
<b>Accelerated UV Ageing</b>	No Effect	ISO:4892-3/100Hrs
<b>Cement Board Fire Rating</b>	8mm	Class '1' Surface Spread of Flame
	12mm	A1 Non-Combustible (EN 13501-1)



# SANDWICH PANEL

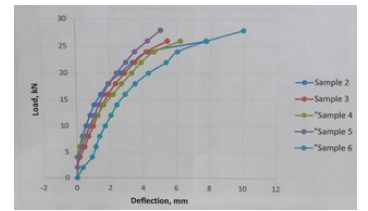
Modulus of Elasticity | Compression Test |  
High Wind Pressure | Acoustical Test | Fire  
Resistant | UV Exposure | Thermal Conductivity



## COMPRESSION TEST ON PLASTIC BLOCK

THE SPECIMEN WAS MADE WAS PLASTIC BLOCK OF DIMENSION 30mm x 60mm x 60mm

- AVERAGE LOAD APPLIED (kN): 26.8 kN
- AVERAGE COMPRESSIVE STRENGTH (MPa): 14.9 MPa
- REMARKS : Bulging was observed when the load was between 14 –16 kN

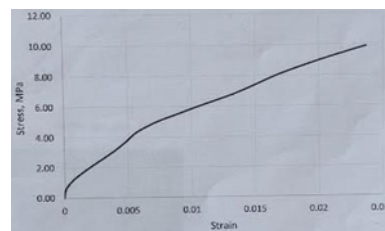


GRAPH OF VARIOUS SAMPLE UNDER COMPRESSION

## TEST FOR MODULUS OF ELASTICITY ON PLASTIC BLOCK

3 PLASTIC BLOCKS OF DIMENSION 30 x 90 x 180mm WAS TAKEN AND HEAT FUSED TO FORM A SPECIMEN OF DIMENSION 90 x 90 x 180mm

- CROSS-SECTION AREA OF THE SPECIMEN (mm<sup>2</sup>) : 8100.0 mm<sup>2</sup>
- AVERAGE LOAD APPLIED (kN) : 103.8 kN
- AVERAGE COMPRESSIVE STRENGTH (MPa): 12.8 MPa.
- MODULUS OF ELASTICITY (MPa) : 663.07 MPa
- POISSON'S RATIO : 0.456



AVERAGE STRESS-STRAIN BEHAVIOUR



BULGING AT MAXIMUM LOAD

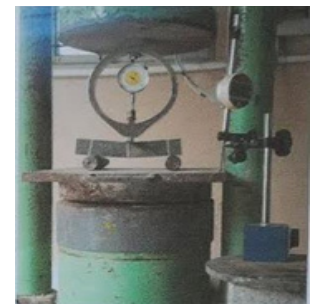


TEST SETUP FOR MODULUS OF ELASTICITY

## 3-POINT BENDING TEST ON PLASTIC BLOCK

THE SPECIMEN WAS MADE WAS PLASTIC BLOCK OF DIMENSION 30mm x 30mm x 150mm

- SPECIMEN DIMENSION (mm): 30 x 60 x 60 mm
- MOMENT OF INERTIA (mm<sup>4</sup>) : 67500.0 mm<sup>4</sup>
- DEFLECTION (mm) : 15 mm.
- AVERAGE LOAD (kN) : 2.29 kN
- AVERAGE BENDING MOMENT (kNm) = 0.1 kNm
- AVERAGE FLEXURAL STRENGTH (MPa): 19.89 MPa



3-POINT BENDING TEST SETUP



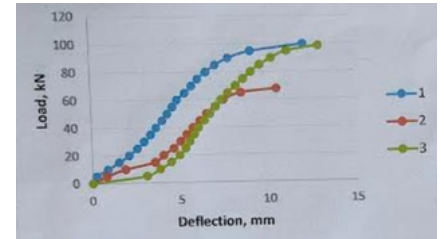
BENDING TEST



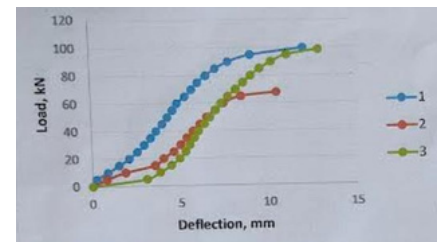
## COMPRESSIVE FORCE PERPENDICULAR AND PARALLEL TO THE CEMENT BOARD

PLASTIC GRID WAS SANDWICHED BETWEEN 6mm CEMENT BOARDS AND LOAD WAS APPLIED PARALLEL TO THE CEMENT BOARD

LOAD APPLICATION	DIMENSIONS (mm)			AREA(mm <sup>2</sup> )	AVG. LOAD APPLIED(kN)	AVERAGE COMPRESSIVE STRENGTH (MPa)	REMARKS
COMPRESSIVE FORCE PERPENDICULAR TO THE CEMENT BOARD	100	100	200	10000	88.6	8.9	BULGING WAS SEEN IN THE SPECIMEN
COMPRESSIVE FORCE PARALLEL TO THE CEMENT BOARD	100	100	200	10000	109.2	10.9	CRACKING WAS SEEN IN THE SPECIMEN



DEFLECTION VS LOAD GRAPH FOR DIFFERENT SAMPLES FORCE APPLIED PERPENDICULAR TO CEMENT BOARD



DEFLECTION VS LOAD GRAPH FOR DIFFERENT SAMPLES FORCE APPLIED PARALLEL TO CEMENT BOARD



TEST SETUP OF COMPRESSIVE FORCE PARALLEL TO CEMENT BOARD



TEST SETUP FOR COMPRESSIVE FORCE PERPENDICULAR TO CEMENT BOARD

## COMPRESSION TEST ON WALL PANELS

THE PLASTIC WALL PANEL (WITH GRIDS) WAS PLACED VERTICALLY AND COMPRESSIVE LOAD WAS APPLIED.

SPECIMEN TYPE	DIMENSION (mm)			AREA(mm <sup>2</sup> )	LOAD (kN)	COMPRESSIVE STRENGTH (MPa)
Single Board	620	1195	126	78120	40	0.51
Double Board	620	1195	138	85560	180	2.1
Triple Board	620	1195	150	93000	107.3	1.15



TEST SETUP OF WALL PANELS WITH TRIPLE CEMENT BOARD

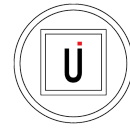


TEST SETUP OF WALL PANELS WITH DOUBLE CEMENT BOARD



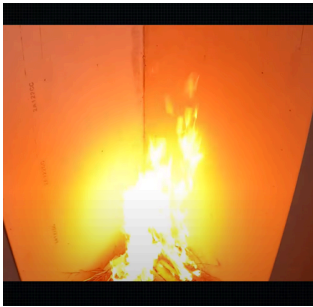
TEST SETUP OF WALL PANELS WITH SINGLE CEMENT BOARD





# TESTING & VALIDATION

FIRE | IMPACT | WIND | UV-HEAT | VERTICAL LOAD | SOUND INSULATION



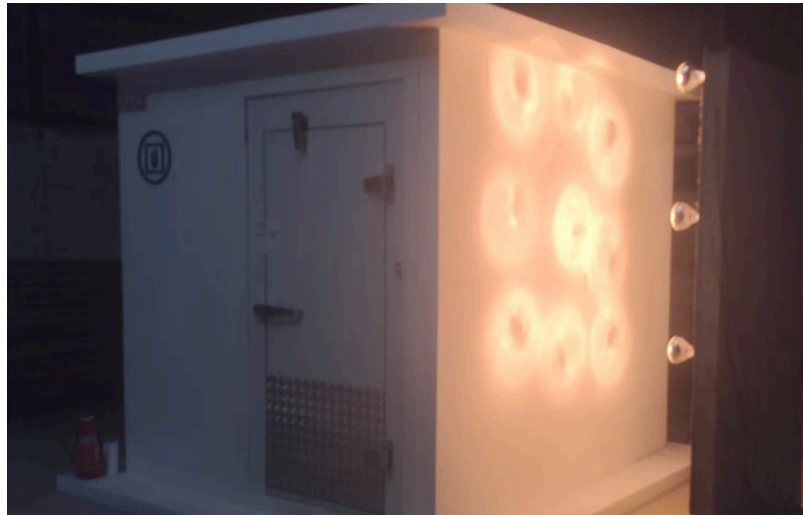
**FIRE RATED CEMENT FIBER BOARD**  
Indian Standard (IS) 14862 (2000))  
60 -240 Minutes based on thickness



**EXTERME WIND LOAD SIMULATION**  
1000kgs/m<sup>2</sup>



**DESTRUCTIVE TESTING**  
Sledge Hammer test



**SOLAR HEAT SIMULATION**  
Sun Simulation. 108DegC Surface temperature for 8 hrs, No influence to internal room temperature



**ACOUSTICAL TESTING**  
> 33 R'W

### COMPRESSION TEST ON WALL PANELS

THE PLASTIC WALL PANEL (WITH GRIDS) WAS PLACED VERTICALLY AND COMPRESSIVE LOAD WAS APPLIED.



TEST SETUP OF WALL PANELS WITH TRIPLE CEMENT BOARD



TEST SETUP OF WALL PANELS WITH DOUBLE CEMENT BOARD

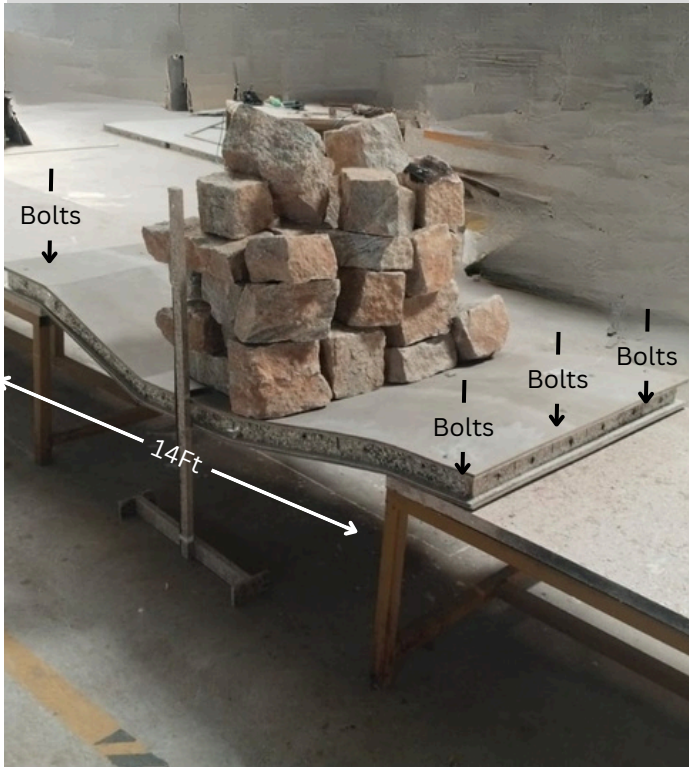


TEST SETUP OF WALL PANELS WITH SINGLE CEMENT BOARD

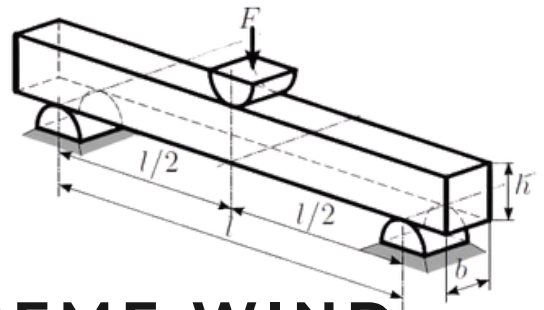
RV  
12 JUN 2024  
RV College of Engineering  
Mysuru Road, Bengaluru-560 059

SPECIMEN TYPE	DIMENSION (mm)			AREA(mm <sup>2</sup> )	LOAD (kN)	COMPRESSIVE STRENGTH (MPa)
Single Board	620	1195	126	78120	40	0.51
Double Board	620	1195	138	85560	180	2.1
Triple Board	620	1195	150	93000	107.3	1.15





Test Setup



## EXTREME WIND SIMULATION

The purpose of the three-point bending test for Ui Panels is to assess their flexural strength and stiffness under load. These results help determine the panel's resistance to bending, cracking, or failure—critical for curved and load-bearing applications.

While the test applies a localized force, its outcomes can be correlated to how the panel might perform under distributed wind loads, offering insights into structural resilience and deformation behaviour during high-pressure events.

## 3 POINT BENDING

FLEXURE | STIFFNESS | WIND RESISTANCE

In this test, the panel is supported at two ends while a load is applied at the center, creating a bending moment. It helps determine how much force the panel can withstand before it cracks, deforms, or fails. For modular or thermal panels, this test provides valuable insights into their load-bearing capacity, material integrity, and suitability for curved or load-sensitive applications. It's especially useful during product validation and certification phases.



# CONCLUSIONS

## Test Details

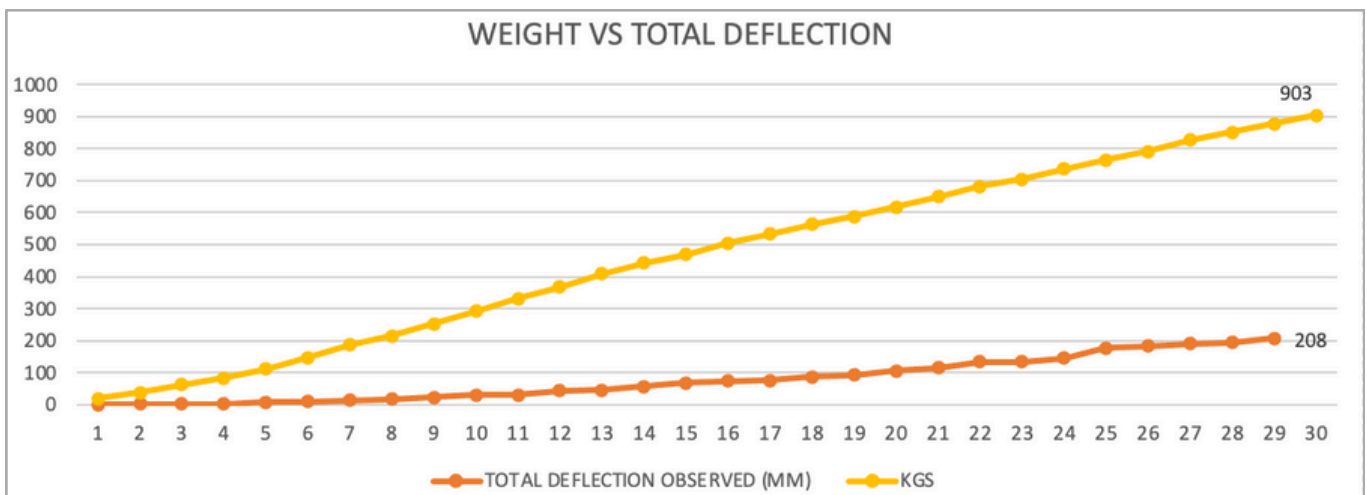
- **Total Weight Applied Before Failure:** 903 kgs
- **Load Distributed Area:** Not greater than 1 m<sup>2</sup>
- **Total Deflection Observed:** 205 mm
- **Test Duration:** 362 minutes (6 hours)

## Comments

- A typical wind speed of 180 MPH exerts a force of 220 kg/m<sup>2</sup>, and the panel can withstand more than four times that capacity.
- Notable flexibility was observed, showcasing outstanding performance against high-pressure.



HEIGHT FROM THE GROUND	TOTAL DEFLECTION OBSERVED	KGS
803	0	19
800	3	38
785	15	216
780	20	252
729	71	505
711	89	588
697	103	618
687	113	650
608	192	852
595	<b>205</b>	877
		<b>903</b>



# THERMAL CONDUCTIVITY

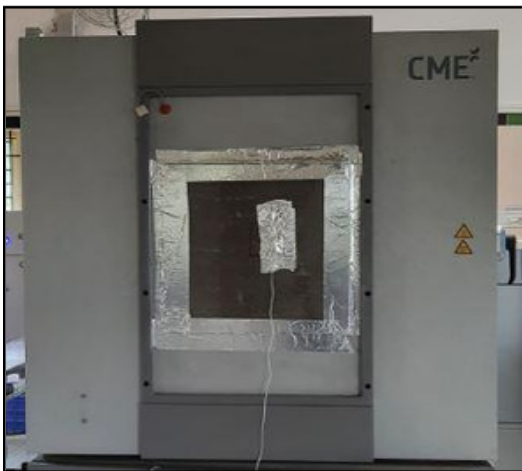
Material Name: Sandwich panel ( Combination of Cement fibre Board\* 03 Nos)  
Dimension: Total panel size 500x500x145 mm [ Board 500x500x7mm 2Nos & 500x500x100mm 1Nos ]  
Type of Test: Temperature test at 60°C.  
Purpose of test: To check the heat transfer  
Equipment used: Climatic chamber, PAC-540-A-H, R&D chamber  
Master's used: Autonics Temperature controller with RTD sensor to capture temperature readings.

## **Information:**

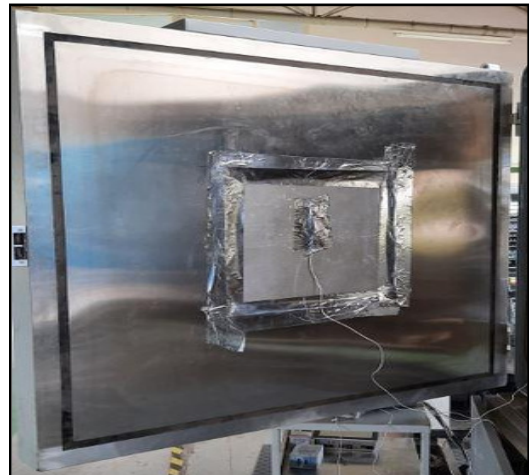
Test start Date & time: 22.03.2021 & 11:00AM  
Test End Date & time: 23.03.2021 & 10:00AM  
Total test duration in hour's: 23 hours

Photo evidence of sensor placement location:

**Panel - outer (Sensor 2)**



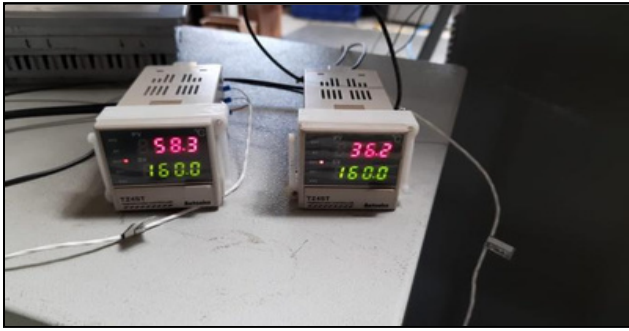
**Panel - Inner (Sensor 1)**



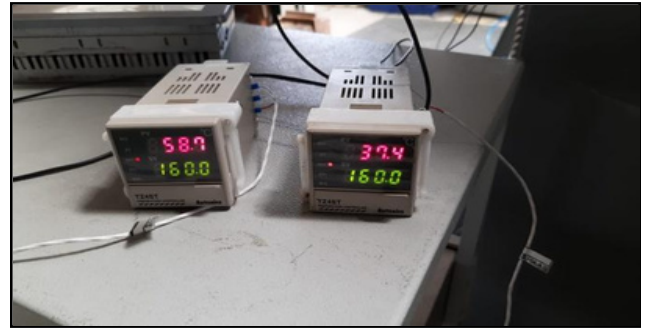
Sample Board Images:



## ***Image Reference for Temperature difference***



***At 12:00PM on 22/3/21***



***At 3:00PM on 22/3/21***



***At 6:00PM on 22/3/21***



***At 8:00AM on 23/3/21***



# THERMAL INSULATION WITH HOT AIRFLOW IN THE WALL

## AIM

TO DETERMINE THE TEMPERATURE INSIDE THE ROOM WITH AIR JACKET WHEN AMBIENT TEMPERATURE IS ABOUT 50°C

## APPARATUS

TEST CHAMBER, TEST ROOM, TEMPERATURE SENSORS, ANEMOMETER, DATA LOGGER, AIR-CONDITIONER, IR BULB.

## PREDICTION

AT THE AMBIENT TEMPERATURE ABOUT 50°C THE INNER ROOM TEMPERATURE WILL MAINTAIN 21°C WHEN PASSING THE AIR THROUGH THE PANEL

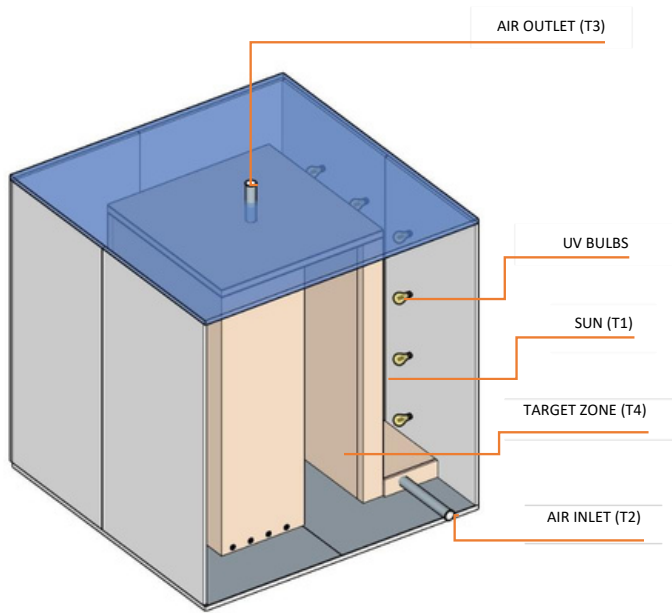
## OBSERVATIONS

		SUN	AIR IN	AIR OUT	TARGET ZONE	AIR IN VELOCITY	AIR OUT VELOCITY
EXPERIMENTS	TIME (hr)	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	V1 (km/hr)	V2 (km/hr)
NATURAL CONVECTION 1" DIA OUTLET	3	108.1	25.9	52.7	31.0	-	-
NATURAL CONVECTION 4" DIA OUTLET	1	75.2	29.1	29.7	25.5	-	-
FORCED CONVECTION 4" DIA OUTLET	3	84.4	30.7	41.6	28.8	61.2	47.1
CONDITIONED AIR 4" DIA OUTLET	3	65.3	26.9	33.3	21.8	61.2	47.1

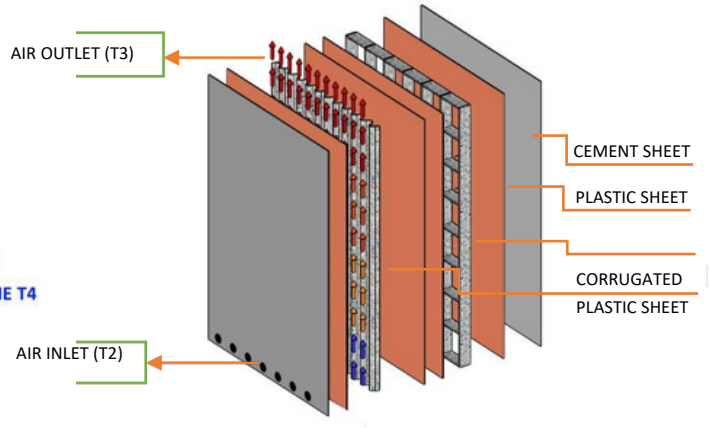
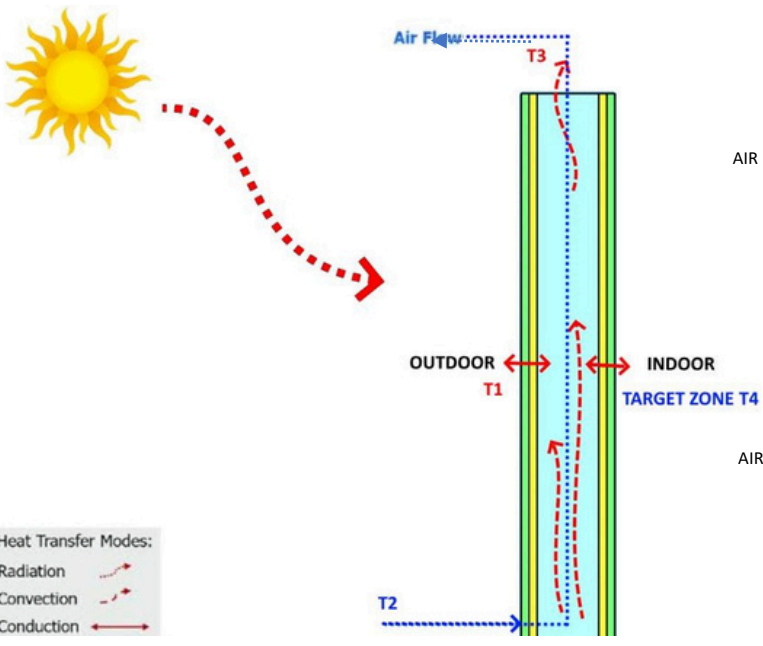
## CONCLUSIONS

	AIR TEMP DIFF	ROOM TEMP DIFF
EXPERIMENTS	T3 - T2 (°C)	T1 - T4 (°C)
NATURAL CONVECTION 1" DIA OUTLET	26.8	77.1
NATURAL CONVECTION 4" DIA OUTLET	0.6	49.7
FORCED CONVECTION 4" DIA OUTLET	10.9	55.6
CONDITIONED AIR 4" DIA OUTLET	6.4	43.5



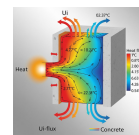


EXPERIMENT SETUP



PANEL CONFIGURATION WITH AIR FLOW





## Key Insights:

### Ui's Secret Weapon:

Multi Layered laminated plastic waste (chip bags, milk covers, etc.) creates a honeycomb structure with trapped air pockets. Air has ultra-low thermal conductivity, making the entire panel a superior insulator.

### Energy Savings Explained:

- Concrete's high U-value (1.0–2.5) = Heat flies through walls → AC works overtime.
- Ui's low U-value (0.1–0.5) = Heat stays blocked → AC runs minimally. → 80% lower cooling costs (critical in data centers where 40% power is for cooling!).

### Eco-Innovation:

- Uses non-recyclable plastic waste (MLP) from brands like Nestle/PepsiCo.
- Leverages paper honeycomb tech from packaging to rigid, structural panels.

## Thermal Property Analysis

Property	Definition	Ui Panels	Uninsulated Concrete	Why It Matters
Thermal Conductivity (k)	How easily heat flows through one material	Very Low (Plastic base)	High (Dense material)	Lower *k* = Slower heat transfer → Better insulation per inch of material.
R-Value	Thermal resistance of one layer	High (R=10–2 m <sup>2</sup> K/W)*	Low (R=1.0–0.4 m <sup>2</sup> K/W)*	Higher R = Better insulation → Heat stays in/out.
U-Value	Heat transfer rate of entire panel	0.1–0.5 W/m <sup>2</sup> K (Excellent insulation)	1.0–2.5 W/m <sup>2</sup> K (Poor insulation)	Ui is 10× better! Lower U = Less heat escapes → Massive energy savings.

## Why This is Revolutionary:

- **For Hot Climates:** Uipanel's drastically reduce "cooling load" during heatwaves.
- **For Data Centers:** Slashing 40% cooling energy = millions saved + greener operations.
- **For Waste Crisis:** Diverts single-use plastics from landfills/oceans into durable buildings.

In simple terms: Ui panels turn trash into a "thermal shield" that out-insulates concrete 10-to-1 and the planet wins.

### Use Case Scenario: Office Building in a Hot Climate

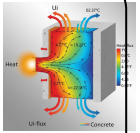
- Mumbai, India (average summertemperature:35°C)
- Wall Size : 10m × 3m (30m<sup>2</sup> total surface area)
- CoolingCost : ₹100 per kWh for air conditioning

→ buildings stay cool naturally,

Property	Ui Panel (Plastic Waste)	Uninsulated Concrete Wall	Significance
Thickness	100 mm (0.1 m)	200 mm (0.2 m)	Thicker does not always mean better if the material conducts heat easily.
Thermal Conductivity (k)	0.04 W/m·K	1.5 W/m·K	Ui is 37.5 times more resistant to heat flow per meter than concrete.
R-Value	R-2.5 m <sup>2</sup> ·K/W	R-0.13 m <sup>2</sup> ·K/W	Ui resists heat 19 times better thickness / k).
U-Value	0.4 W/m <sup>2</sup> ·K	7.7 W/m <sup>2</sup> ·K	Ui loses heat 19 times slower than concrete (R =

than concrete (U = 1 / R).





## 🔥 Heat Transfer Calculation

### Heat Loss Formula:

$Q = U \times \text{Area} \times \Delta T \times \text{Time}$ ; (Where  $\Delta T$  = Temperature difference between inside/outside)

- $\Delta T$ : 15°C (Target indoor temperature: 20°C vs. outdoor 35°C); Time: 1 hot day (24 hours)

Material	Heat Loss (Q)	Cooling Cost per Day
Ui Panel	$0.4 \times 30 \times 15 \times 24 = 4,320 \text{ Wh}$	₹432
Concrete	$7.7 \times 30 \times 15 \times 24 = 83,160 \text{ Wh}$	₹8,316

### Ui panels result in 94.8% savings on cooling costs compared to concrete!

#### Why Ui's k is exceptionally low (0.04 W/m·K):

1. Constructed from **multi-layered plastic honeycomb** + integrated trapped air pockets.
2. Air possesses ultra-low conductivity ( $k=0.024 \text{ W/m}\cdot\text{K}$ ), rendering the composite highly insulating.

#### Why Concrete's U-Value is Poor:

3. Its high **k** ( $1.5 \text{ W/m}\cdot\text{K}$ ) combined with lack of insulation allows heat to readily transfer.
4. **R-Value =  $0.2 \text{ m} / 1.5 = 0.13$**  → U-Value =  $1/0.13 = 7.7 \text{ W/m}^2\cdot\text{K}$

#### Ui's Superiority:

1. The combination of low **k** plastic (0.04) + an intelligent honeycomb design leads to **High R-Value (2.5)**, resulting in a **Low U-Value (0.4)**.

#### 💡 Real-World Impact

- **For a Data Center:** Replacing 500m<sup>2</sup> of concrete walls with Ui panels can lead to:
  - **Annual Savings:** ₹8,316/day × 365 = **₹3.03 CRORE/year**
  - **Carbon Reduction:** Approximately 200 tons of CO<sub>2</sub> (due to 40% less cooling energy, meaning fewer fossil fuels burned).
- **Waste Diversion:** The creation of one Ui panel utilizes 10,000 chip bags, contributing to the cleaning of oceans and landfills.

#### 🌟 The Takeaway:

- **k** = The inherent insulating capacity of a material.
- **R** = How effectively a specific thickness of that material resists heat.
- **U** = The ease with which the entire wall system leaks energy.

[Ui excels in all three aspects → revolutionizing sustainable construction!!! 🏗️♻️](#)

Mr Iype Verghase  
Systems and Process Analyst



# Unified Intelligence Acoustical Field Testing Report

– Sound Isolation Performance of Panel Types



## Octavox Media LLP

July 2025



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<b>Report Title</b>	Acoustical Field Testing Report – Sound Isolation Performance of Panel Types
<b>Issue</b>	1 1 22-07-2025 Octavox Media LLP Octavox Media LLP
<b>Revision</b>	This report has been prepared by M/s Octavox Media LLP for Unified Intelligence's sole and specific use. "This report presents results from on-site field measurements simulating panel use as a door partition. The results provide indicative isolation values under field conditions and are not a substitute for laboratory test certification."
<b>Date</b>	
<b>Prepared By</b>	
<b>Approved By</b>	
<b>Note</b>	



## Introduction:

This report, prepared by Octavox Media for Unified Intelligence, presents an acoustical evaluation of 4 different panel construction types. It assesses the sound isolation performance of each panel when mounted as a door in a closed room. The goal of this exercise is to understand the overall sound reduction offered by these panels (R<sub>w</sub> rating).

*This report presents results from on-site field measurements simulating panel use as a door partition. The results provide indicative isolation values under field conditions and are not a substitute for laboratory test certification.*

## Standards & Regulations:

1. AS/NZS 2107:2016 - Acoustics—Recommended design sound levels and reverberation times for building interiors.
2. BS EN ISO 16283:2014 Part 1 Acoustics - Field measurement of sound insulation in buildings and of building elements - Airborne Sound Insulation.
3. BS EN ISO 11654:1997, Acoustics Sound absorbers for use in buildings - Rating of sound absorption.

## Measurement Equipment

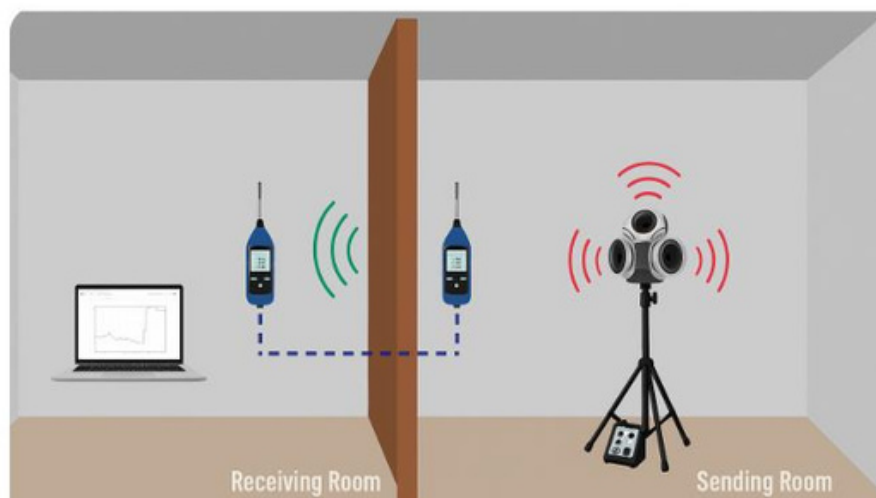
- 1) Embedded Acoustics - BedrockAudio SM90 Class-1 measurement device, calibrated before testing.
- 2) NTI Acoustics Delta Clapper.
- 3) Bosch GLM40 laser meter to measure room dimensions.
- 4) Standard tripod to mount the measurement device, with microphone position fixed at 1.2 meters from the finished floor level.
- 5) Bose S1 Pro powered loudspeaker.

## The Room Measured:

Height:2.3m | Width:2.23m | Length: 2.42m



## Measurement Process: WALL ISOLATION RATING: $D'w$ / $R'w$ (Weighted Sound Reduction)



*Airborne sound insulation measurement*

**The general principle for this measurement is that sound is generated in one room (the sending room) and the sound measured on either side of the partition (in the sending room and one or more receiving rooms), the difference between both (frequency-dependent) levels quantifies the insulation offered by the partition.**

Four different frequency-dependent measures of sound reduction are assessed simultaneously:

**D: Level difference.** The difference in sound level (per frequency band) as observed between sending and receiving room (also known as Transmission Loss).

**$D_n$ : Normalized level difference.** The difference in sound level (per frequency band) is normalized to the size of the room.

**$D_nT$ : Standardized level difference.** Level difference  $D$  is standardized to the reverberation time of the receiving room.

**$R'$ : Apparent sound reduction index.** Quantifies sound power observed in the receiving room, including direct as well as flanking incidence and other components. Takes the reverberation in the receiving room and the surface area of the partition between sending and receiving room into account.

In addition to the above, single number metrics are also derived as per ISO 717 & ASTM E413.

These are also calculated simultaneously by the device:

**$R'w$ : Weighted apparent sound reduction index.** This is the dominant metric used when applying ISO-717 to measure and specify sound insulation in buildings.

**STC: Sound Transmission Class.** A weighted, single-number measure of sound attenuation as defined by ASTM E413.

### Measurement Process:

- 1) Place a sound source in the sending room.
- 2) Measure the 1/3 octave spectrum at 6 locations in the sending room.
- 3) Measure the 1/3 octave spectrum at 6 locations in the receiving room.
- 4) Determine the mean  $D$  across sending/receiving measurement.
- 5) Measure the 1/3 octave spectrum of the natural background noise in the receiving room.
- 6) Calculate  $D_n$  and  $D_nT$  by normalizing/standardizing in terms of the reverberation characteristics of the receiving room.
- 7) Calculate  $R'$  based on  $D$  taking into account the surface area of the partition as well as the reverberation time in the receiving room.



**Typical Panel & Mounting:**



**Measurement Data:**

**Reverberation Time in the room:**

Frequency (Hz)	31.5	63	125	250	500	1000	2000	4000	8000
RT60 (s)	0.74	0.8	0.77	0.72	0.6	0.61	0.6	0.64	0.53

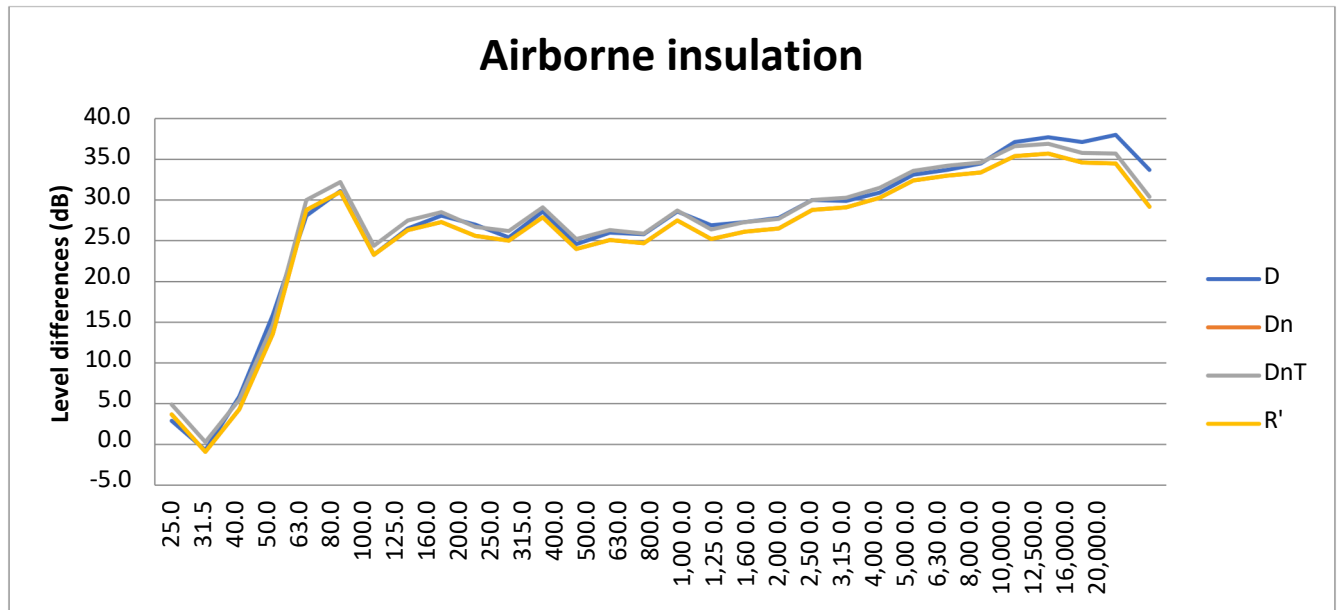
Reverberation time is quite linear across the room and the same values are applied for all the panels to calculate the isolation rating.



# Results

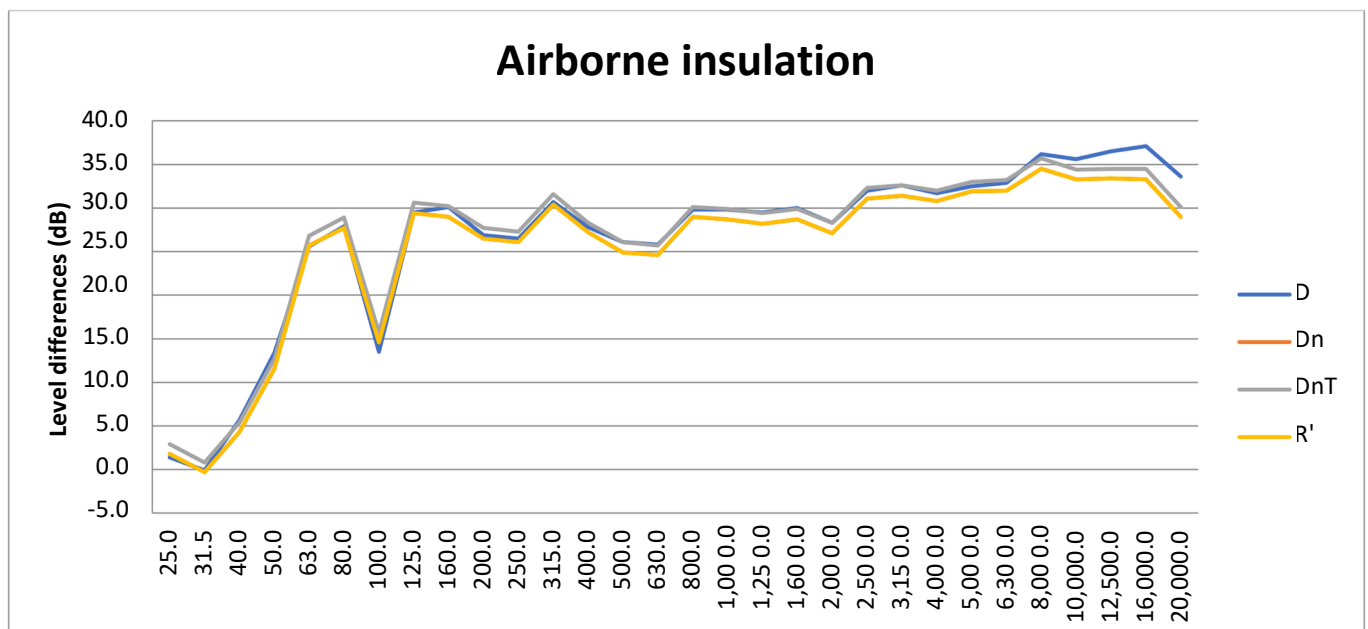
## Panel 1 – Single Panel without Cement board topping

SRI	X,w
R',w (C 125 - 3150;C tr 125 - 3150)	26
Dn,w (C 125 - 3150;C tr 125 - 3150)	26
DnT,w (C 125 - 3150;C tr 125 - 3150)	27



## Panel 2 – 50mm Panel

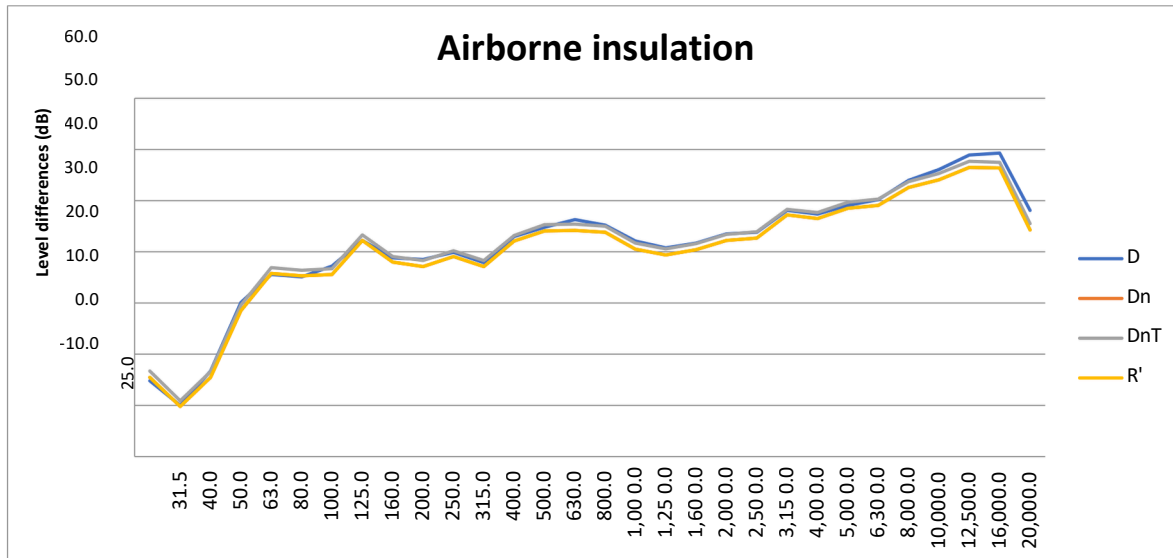
SRI	X,w
R',w (C 125 - 3150;C tr 125 - 3150)	28
Dn,w (C 125 - 3150;C tr 125 - 3150)	28
DnT,w (C 125 - 3150;C tr 125 - 3150)	29



**Panel 3 – 100mm Standard Panel**

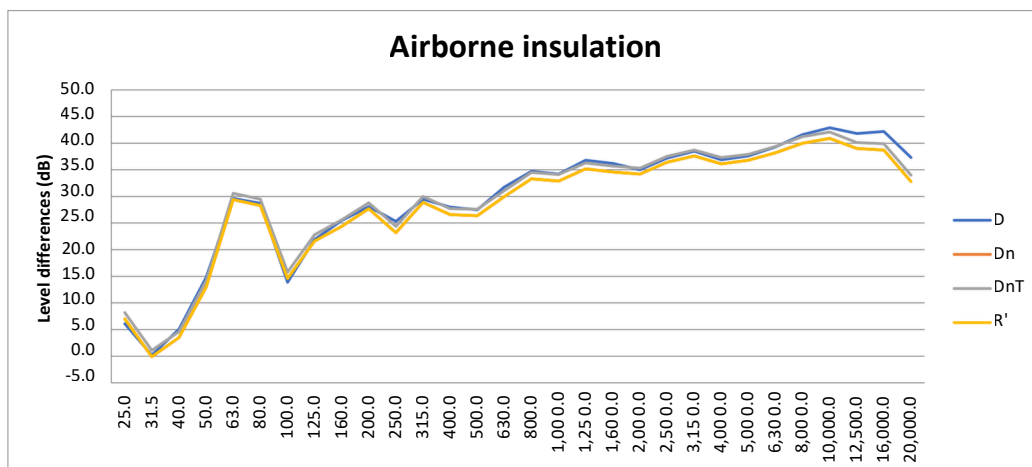


SRI	X,w
R',w (C 125 - 3150;C tr 125 - 3150)	33
Dn,w (C 125 - 3150;C tr 125 - 3150)	33
DnT,w (C 125 - 3150;C tr 125 - 3150)	34



**Panel 4 – 150mm Dual Channel Panel**

SRI	X,w
R',w (C 125 - 3150;C tr 125 - 3150)	33
Dn,w (C 125 - 3150;C tr 125 - 3150)	33
DnT,w (C 125 - 3150;C tr 125 - 3150)	34



## Summary of Panel Isolation Rating (R'w) Results:

No Room R'w	
1 Single panel without cement board topping	26
2 50mm Panel	28
3 100mm Standard Panel	33
4 150mm Dual Channel Panel	33

Due to the mass and well-constructed nature, significant isolation results are achieved by the panels.

### Key Observations:

- Increasing panel thickness leads to higher sound insulation.
- 100mm and 150mm panels perform similarly, suggesting diminishing returns beyond a certain thickness or potential installation/structure limits. However, 150mm panel offers better low-frequency control.
- The reverberation time across frequencies was stable and acceptable for calculation standardization.
- Panels were tested on-site in a closed room, simulating a door mounting condition.

### Recommendations:

- Due to the **field-test nature**, performance may not fully reflect controlled lab conditions.
- **Laboratory testing** is recommended for precise classification and generation of data sheets for acoustical use.

- End of report -

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