



About OBL

Orient Bell Limited (OBL) is amongst the largest manufacturers of Wall and Floor Tiles. Established in 1977, OBL has been a pioneer in the Industry with a focus on customer-centric innovation.

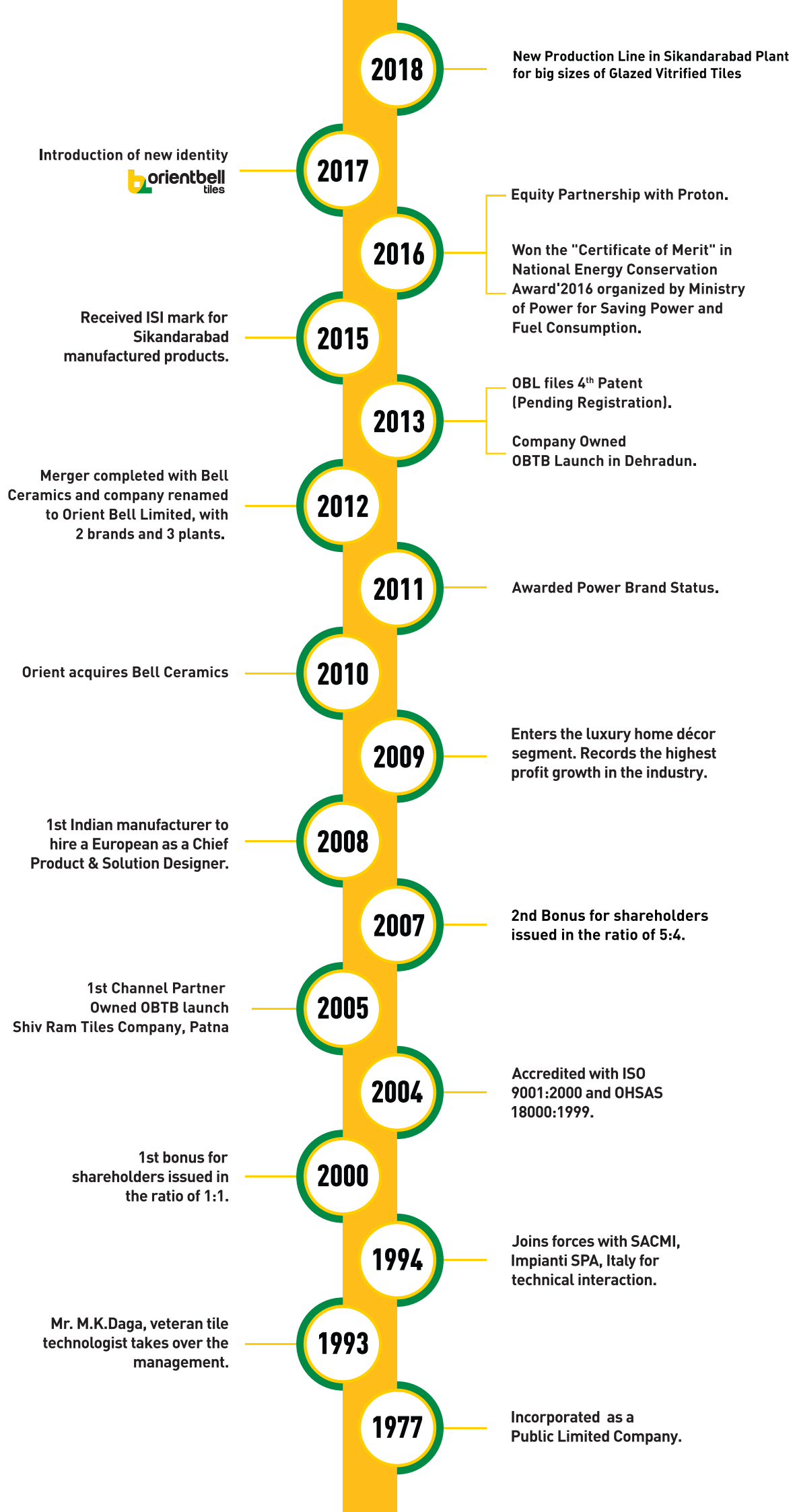
First to manufacture ultra-vitrified tiles, new product designs & development is a continuous process at OBL. As a result it has an extensive range of tiles with various finishes & textures. It has 4 patent-pending technologies: Forever Tiles, GermFree Tiles, Cool Tiles & Life Tiles.

To display extensive range of tiles, we have a chain of signature showrooms. Privileged to be associated with premier architects and construction agencies of the country, it also counts most leading developers as well as government & public sector institutions as its customers.



- The ISO 9001:2015 accreditation for our quality control management systems reflects the quest for manufacturing international standard products.
- In 2015 our Sikandarabad plant was awarded with prestigious ISI certification for its products.
- In May 2000, OBL was awarded ISO 14001 certification by the internationally recognised BSI Management Systems, UK.
- Our manufacturing units are ISO 14001:2015 certified, the most complete and global expression for an environment friendly industrial company.
- We have been awarded OHSAS 18001 Certification for Health & Safety Standards. No waste water is ever discharged from our factory.
- We were also awarded with "Certificate Of Merit" in 'National Energy Conservation Award' 2016 organised by Ministry of Power for saving Power and Fuel consumption.

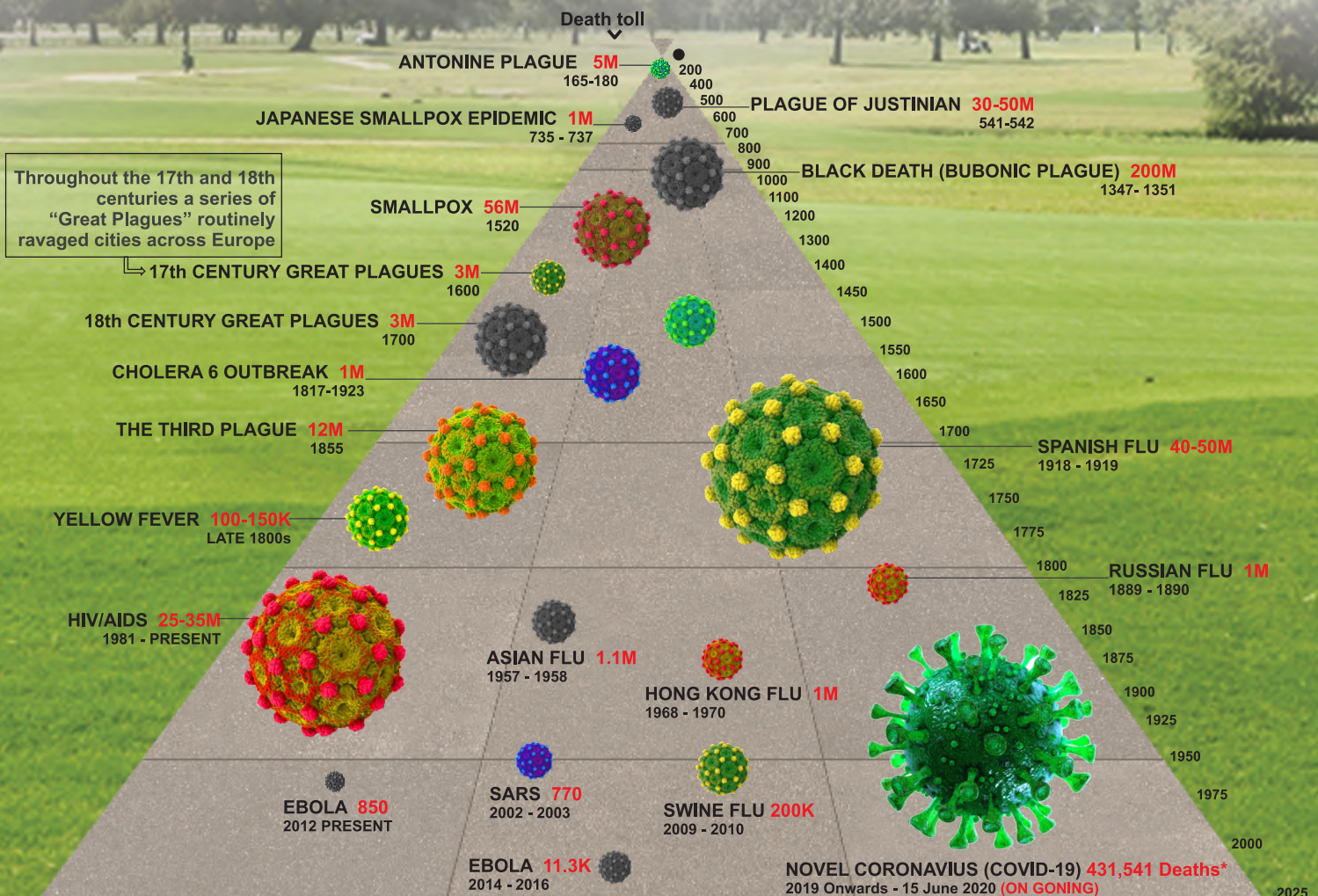




HISTORY OF EPIDEMICS

THROUGHOUT HISTORY, as humans spread across the world, infectious diseases have been a constant companion

Here are some of history's most deadly pandemics and epidemics, from the Antonine Plague to Novel Coronavirus (COVID-19)



Even in this modern era, outbreaks are nearly constant.

The company does not claim that the 'Germ Free Tiles' cure, mitigate, treat or prevent any infectious viral or other diseases.
*As per WHO Update as of 7:35pm CEST, 15 June 2020, available at <https://covid19.who.int/>

THE MECHANISM OF INFECTION



WHAT RESULTS IN PANDEMIC

It happens when a microbe becomes capable of spreading rapidly among the human race.



A pandemic is usually caused by
–bacteria that become resistant to antibiotic treatment.
–a new virus strain or subtype that becomes easily transmissible between humans, or



Humans may have little or no immunity against a new microbe ?



If microbe starts to spread between people, it would spread easily and a pandemic can result.

In such cases, the first priority is to prevent its transmission.

CONTAINMENT IS THE KEY TO PREVENTION OF PANDEMIC

A few proven ways for containment



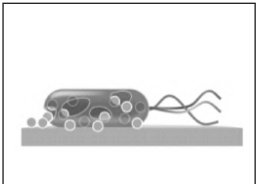
HAND SANITIZERS : Chemicals / thermal treatment / radiation to kill microbes on the hand



MASS AREA SANITIZERS : Chemical / thermal treatment / Radiation treatment (UV / IR) / static electrical shock to prevent the growth of microbial population in particular area.



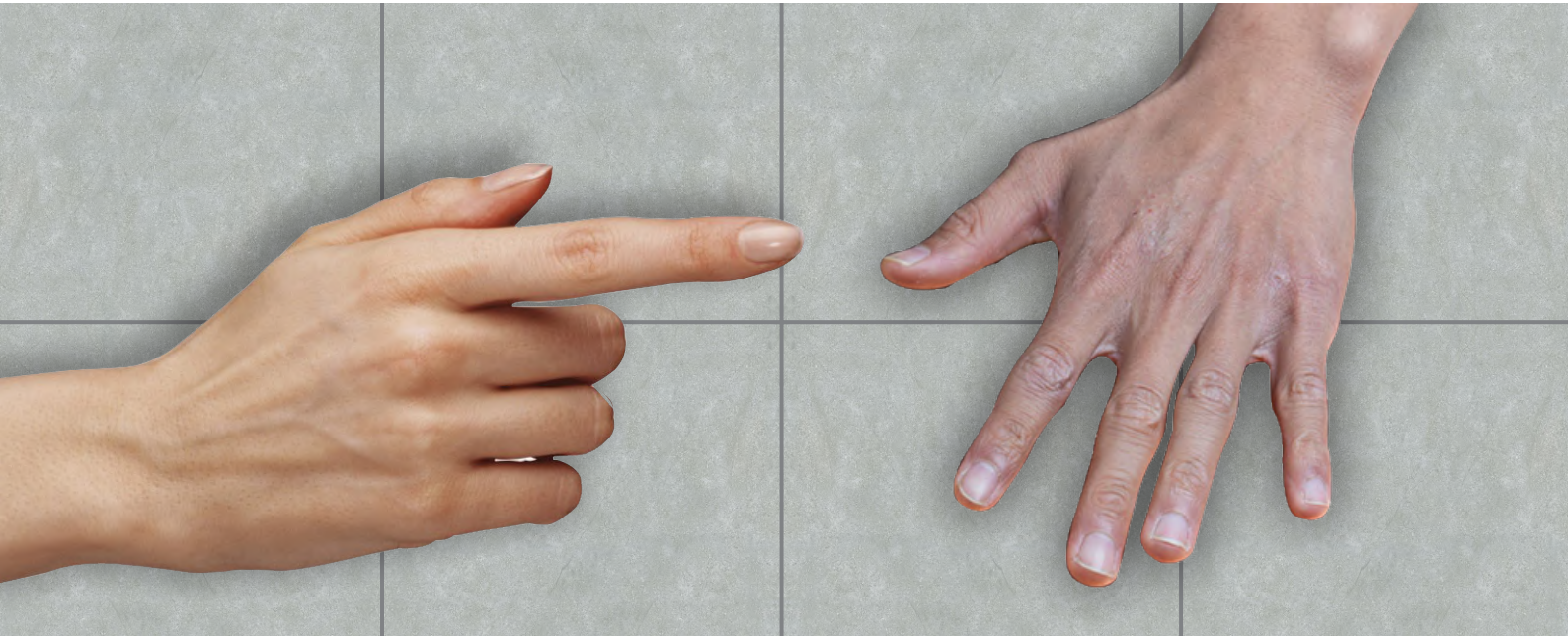
MASK AND OTHER PPEs: Special kind of masks / gloves / body suits that stop transmission of virus to the human body.



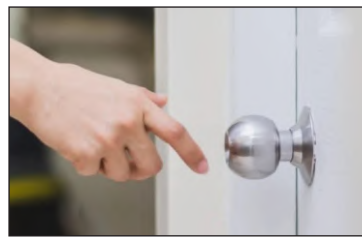
ANTI-MICROBIAL SURFACE: This is a special surface which kills the microbe that come into its contact and prevents transmission to the next person.

–"Disinfection & Sterilization Guidelines". *Guidelines Library: Infection Control*. CDC. 28 December 2016. Archived from the original on 12 January 2018. <https://www.livescience.com/face-mask-new-coronavirus.html>
Yamada, H (2010). "Direct Observation and Analysis of Bacterial Growth on an Antimicrobial Surface". *Appl. Environ. Microbiol.* 76 (16): 5409–5414.

WHAT DID WE OBSERVE IN COVID-19



Rapid transmission of virus from one person to another



High rate of infection via Indirect transmission



Hospitals

Infections spread maximum from certain hot spots



Airports



Testing Labs



Metro Stations





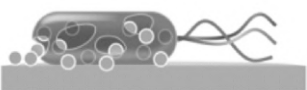
Lift and lift lobbies



Office buildings

Other High transmission risk areas Testing Labs Building common areas (corridors, lift and lift lobbies) Any high traffic area (railway stations, metros, office buildings)

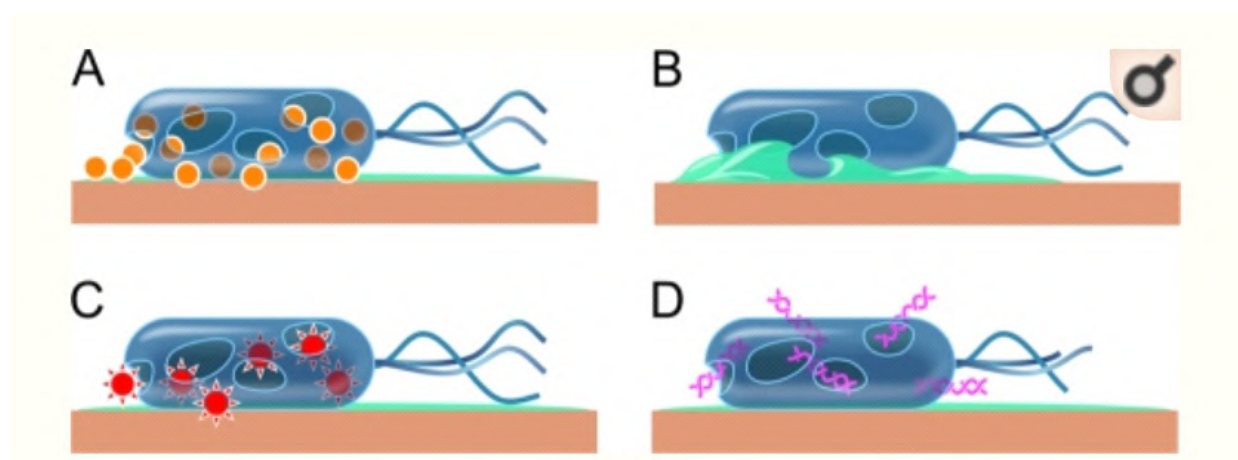
ADVANTAGES OF ANTI-MICROBIAL SURFACES AGAINST OTHER METHODS OF CONTAINMENT

	Hand sanitizers and mass area sanitizers	Mask and other PPEs	Anti-microbial Surface
			
Independent of Human actions	X	X	Y
Independent of behavioral compliance	X	X	Y
Uniformity of effectiveness	X	X	Y
Works 24x7	X	X	Y
Continuously and actively kills Microbes	X	X	Y
Requires frequent ordering and stocking	Y	Y	N
Result →	Dependent on Manual Intervention		Kills microbes even between cleanings

It is very important to reduce the microbe population, if possible to completely kill those while it is waiting on the surface for indirect transmission. Here an anti-microbial chemical treated surface will come to help resolve the issue. The other methods of killing or preventing transmission of microbes may still be used in conjunction with the anti-microbial surface.

HOW DOES A GERM FREE SURFACE WORK

- A: Nano Particles from Germ Free Surface interact with microbe and cause cells damage
- B: The cell membrane ruptures because of nano particles leading to loss of cytoplasmic content
- C: Nano particles ions induce reactive oxygen generation which further causes cell damage
- D: Genomic and Plasmid DNA becomes degraded



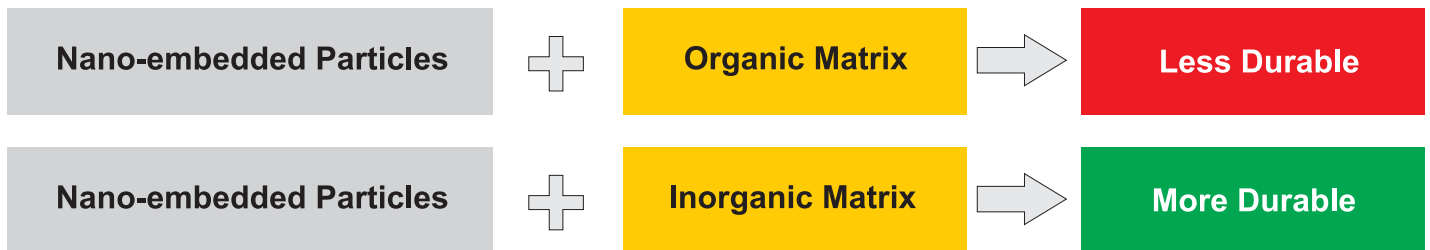
Depiction of tentative events in contact killing*

*ncbi.nlm.nih.gov/pmc/articles/PMC3067274/

Anti-microbial surfaces only restrict indirect transmission, and do not reduce the risk of direct transmission of any infection. The methods to restrict/prevent direct transmission, as advised by the relevant Health Authorities, must be followed.

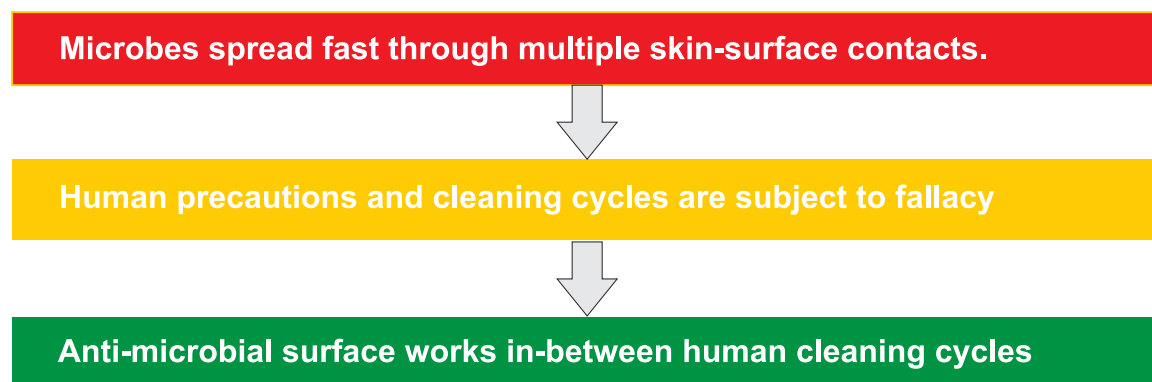
TYPES OF ANTI-MICROBIAL SURFACE

- As per a survey of industrially available technologies done globally there is a combination of surface coatings explored worldwide. The surface coatings
 - with nano-embedded particles in organic matrix – less durable
 - with nano-embedded particles in inorganic matrix – more durable



OBL tiles contain nano-particle embedded inorganic coatings. These are more durable because of their inherent capability to withstand weathering and consequential damage.

IN SUMMARY



Anti-microbial surfaces only restrict indirect transmission, and do not reduce the risk of direct transmission of any infection. The methods to restrict/prevent direct transmission, as advised by the relevant Health Authorities, must be followed.

ZONING

Zoning can be done by use of different coloured tiles in different areas, like floors of rooms, Corridors, reception, OPD, etc. Can be of different colors to depict each zone.

With large number of patients with a wide variety of diseases moving in the premises, it is critical to prevent spread of infection.

Tiles can be used as markers to depict direction, separation and distancing:



1. Direction of movement in corridors



2. Distance to be maintained in high traffic areas like reception, billing and OPD.

OTHER OBL SOLUTIONS SUITABLE FOR HEALTH CARE

FOREVER TILES

OBL Forever Tiles are scratch proof and ideal for rough floor usage areas like:



AMO GREY

- Corridors with regular trolley and stretcher movement
- Store rooms with oxygen cylinders
- Areas with Mobile diagnosis Equipment

OBL FT are rated 8 on Moh's Scale for hardness and thus would prevent scratches from almost everything in a hospital environment.

COOL TILES FOR THE ROOF



With SRI Value-98

5 STAR Benefits with OBL Cool Tiles



Comfortable Interiors

Summer responsive Roof and walls reduce the room temperature by **upto 8 Degrees Celsius**



Environment Care

Lesser chloro-fluro carbon emissions.
Green building norm compliant.



Energy Saving

Lesser room temperature means lesser electricity consumption of AC



Innovative Use

Security Guard Cabin,
Roof Top water Tanks (outer wall)



Additional Advantage

Slip Resistant.
Cooler surface to Walk on.

Forever Tiles or Cool tiles do not use Germ Free technology.

CUSTOMIZED MURAL FOR YOUR HEALTHCARE SETUP

- OBL can provide a Tiles Mural of any image you may want. Step up the positive appeal of your hospital with a mural designed as per your need.:



Use a Mural

- For Reception - Map of India or a Map of your Hospital)
- For Paediatrics Department – Lively murals to cheer up little ones
- For Corridors – Safety Instructions
- For Bathrooms – Right way to wash your hands

Advantages:

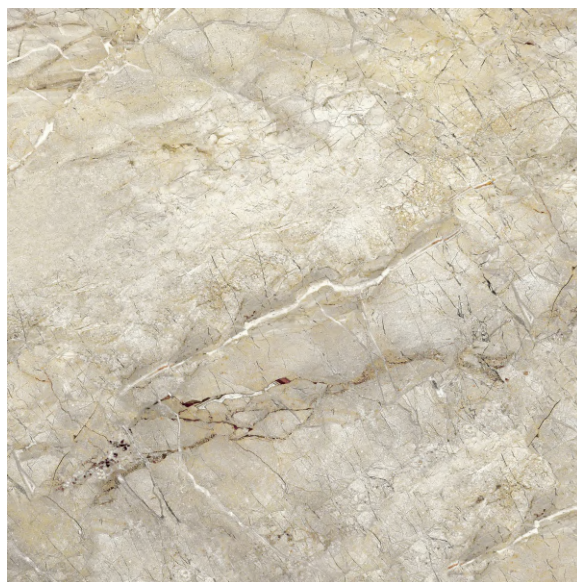
- Permanent, don't get damaged
- Easy to clean and maintain
- Higher Aesthetic Appeal compared to charts and notice boards

INDEX

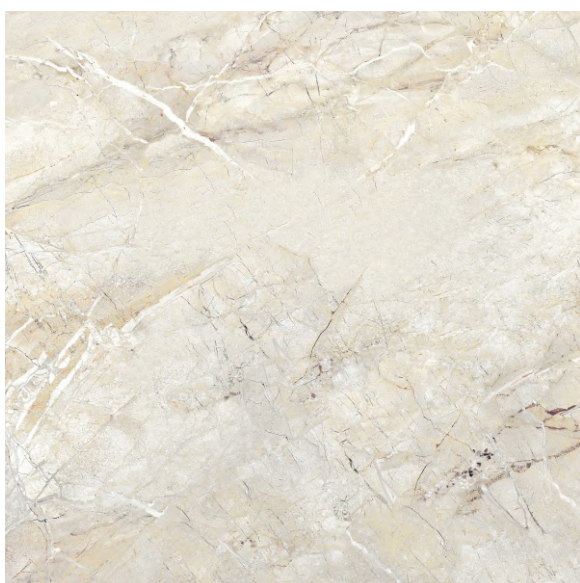


600X600 mm	
PGVT PORINO BEIGE	01-02
PGVT PORINO IVORY	03
PGVT MAKRANA BIANCO	04-05
PGVT S-TRAVERTINO BEIGE	06
PGVT-S STATUARIO SPECIAL	07-08
 300X450 mm / 300X300 mm	
SUNNY IVORY OT 4572	09
PLAIN MOON IVORY	09
ODG ALBERTA BEIGE	10-11
ODG ALBERTA BROWN	10-11
ODM ALBERTA (EC) BROWN FL	10-11
ODG D-LITE GREY LT	12-13
ODG D-LITE GREY DK	12-13
ODM D-LITE GREY LT FL	12-13
 300X600 mm / 300X300 mm	
ODG VICTORIA BEIGE	14-15
ODG VICTORIA BROWN	14-15
ODM VICTORIA (EC) BEIGE FL	14-15
ODH KOLAM BROWN HL	16
GFT LINE STAR WHITE	16
GLACIER WHITE FL	16



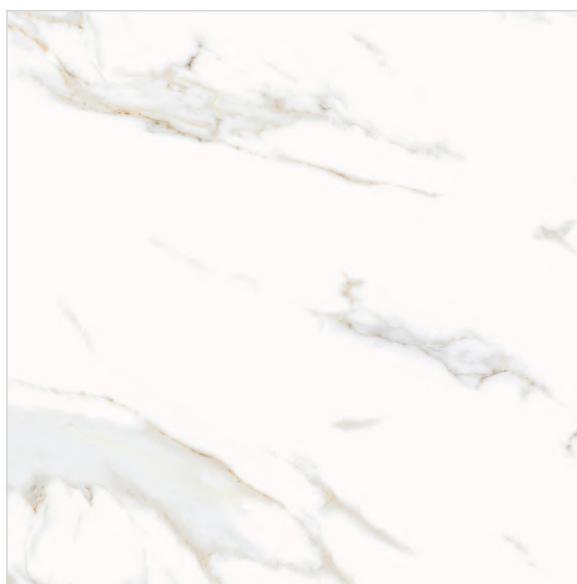
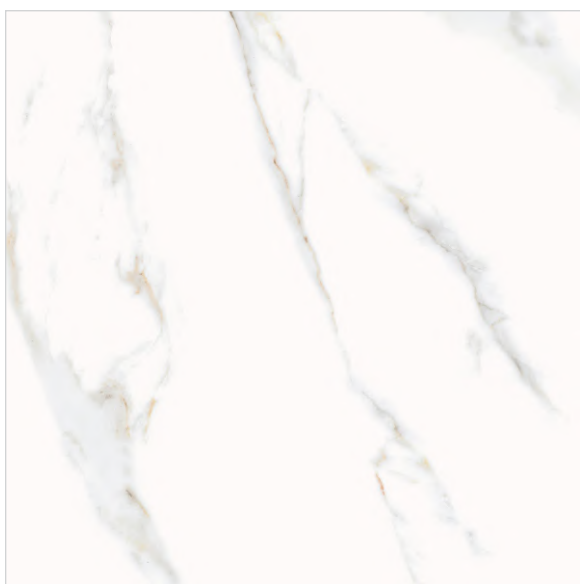
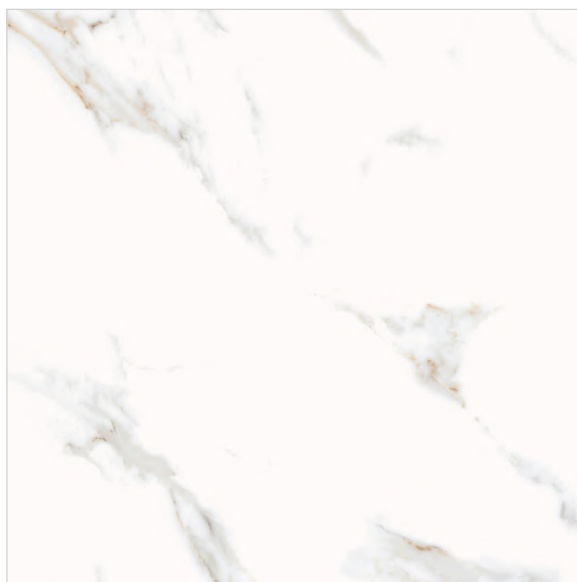
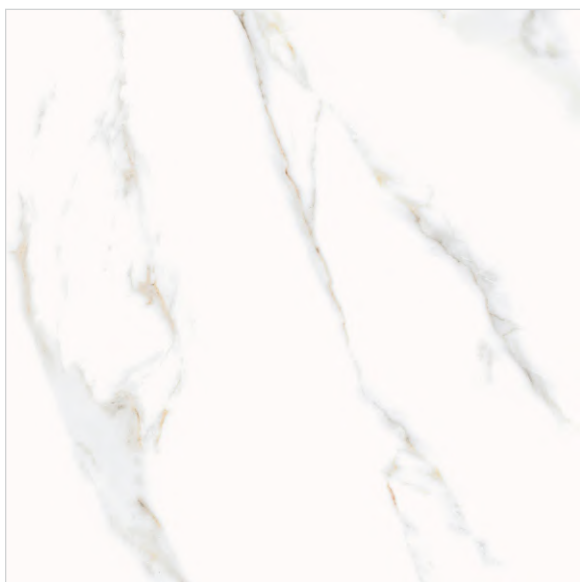


PGVT PORINO BEIGE



PGVT PORINO IVORY



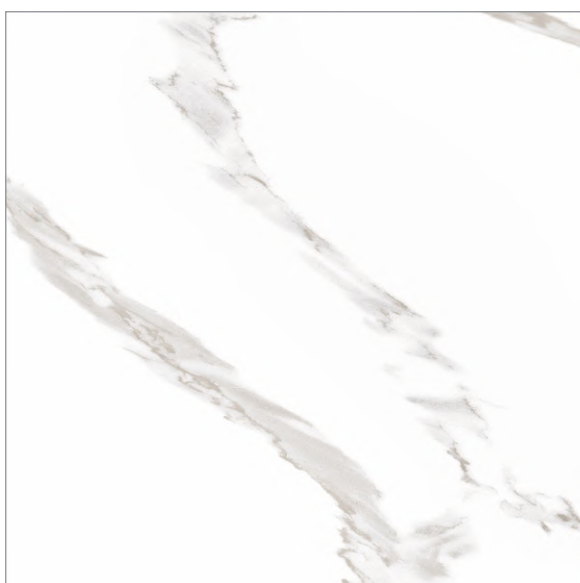


PGVT MAKRANA BIANCO

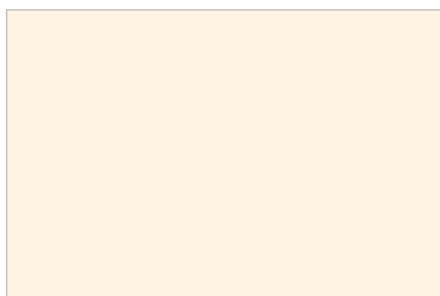


PGVT S-TRAVERTINO BEIGE

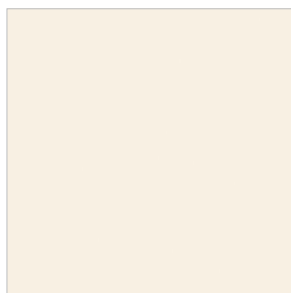




PGVT-S STATUARIO SPECIAL

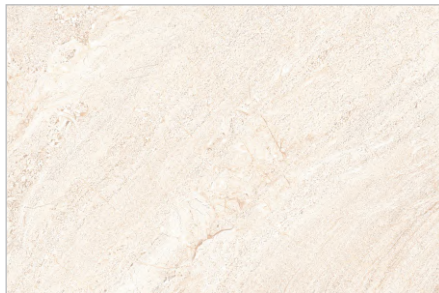


SUNNY IVORY OT 4572



PLAIN MOON IVORY





ODG ALBERTA BEIGE

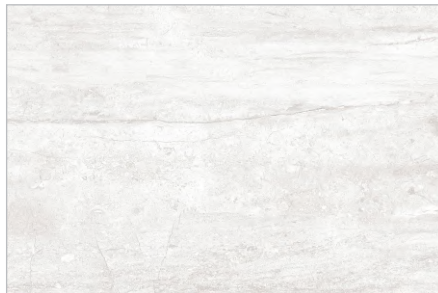


ODG ALBERTA BROWN



ODM ALBERTA (EC)
BROWN FL

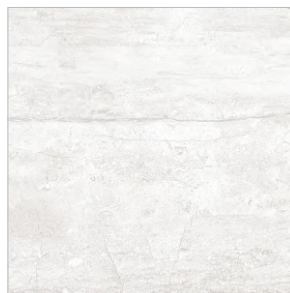




ODG D-LITE GREY LT



ODG D-LITE GREY DK



ODM D-LITE
GREY LT FL





ODG VICTORIA BEIGE



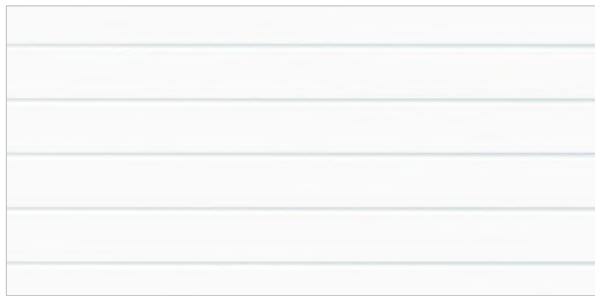
ODG VICTORIA BROWN



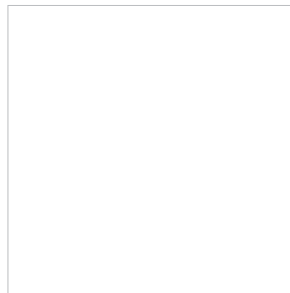
**ODM VICTORIA (EC)
BEIGE FL**



ODH KOLAM BROWN HL



GFT LINE STAR WHITE



GLACIER WHITE FL



SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH

(A unit of Shriram Scientific and Industrial Research Foundation)

An ISO - 9001:2008 Certified Institute

TEST CERTIFICATE

000247052

Issued to :

ORIENT BELL LIMITED,
8, INDUSTRIAL AREA,
SIKANDRABAD - 203205, UTTAR PARDESH

J.O.No. 207-111-1007
Reg.No. 1333612
Date 31-07-2012
GC-01 (REV-04)
Your Ref.No. p.o. no. oc/skd/p
ur/jo/080
Date 10.07.2012

Kind Attn: MR. G. S. TYAGI, SR. MGR. PURCHASE

Sample Particulars :

One sample of Nand Tech Germ Free Tiles, Size 600x600 was received.

TEST RESULTS

- TEST** - Evaluation of Antimicrobial activity of the Tile sample.
PROTOCOL - As per guidelines of JIS - Z 2801-2000
TEST ORGANISM - *Escherichia coli*
Staphylococcus aureus
SAMPLE SIZE - 50mm X 50mm

1. Antibacterial Resistance against *Escherichia coli*

S. No.	Control Sample (marked as untreated)	Count per Piece of control, (in cfu/Piece)	Conc. of Inoculum {Average count , (in cfu/piece)}
1.	Number of bacteria inoculated per piece at 0 Hrs(A)	7.2×10^5	7.3×10^5
		7.6×10^5	
		7.2×10^5	
2.	Number of bacteria inoculated per piece after 24 Hrs incubation(B)	9.5×10^5	9.3×10^5
		9.1×10^5	
		9.4×10^5	

S. No.	Sample (marked as treated)	Count per tile, (in cfu/tile)	Conc. of Inoculum {Average count (C), (in cfu/tile)}	Antimicrobial Activity after 24hrs {log (B/C)}
3.	Number of bacteria inoculated per piece after 24 Hrs incubation(C)	1.7×10^2	1.9×10^2	3.6
		2.1×10^2		
		2.0×10^2		

Contd. to report no. 247053 (Page 1 of 2)

[Signature]
AUTHORISED SIGNATORY
(EMPLOYEE CODE: 6006)



SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH

(A unit of Shriram Scientific and Industrial Research Foundation)

An ISO - 9001:2008 Certified Institute

TEST CERTIFICATE

000247053

Contd. from report no. 247052 (Page 2 of 2)

2. Antibacterial Resistance against *Staphylococcus aureus*

S. No.	Control Sample (marked as untreated)	Count per piece of control , (in cfu/ piece)	Conc. of Inoculum {Average count , (in cfu/ piece)}
1.	Number of bacteria inoculated per piece at 0 Hrs(A)	8.2×10^5	8.2×10^5
		8.0×10^5	
		8.5×10^5	
2.	Number of bacteria inoculated per piece after 24Hrs incubation. (B)	9.7×10^5	9.4×10^5
		9.4×10^5	
		9.2×10^5	

S. No.	Sample (marked as treated)	Count per tile , (in cfu/ tile)	Conc. of Inoculum {Average count (C), (in cfu/ tile)}	Antimicrobial Activity after 24hr {log (B/C)}
3.	Number of bacteria inoculated per piece after 24 Hrs incubation(C)	Less than 10	Less than 10	5.9
		Less than 10		
		Less than 10		

Interpretation: The antimicrobial efficacy of Tile was found to be 3.6 against *Escherichia coli* and 5.9 against *Staphylococcus aureus*, which are above the value of 2.0 as per the guideline, hence sample of tile passes the test.

DOR: 11-07-2012

DOC: 30-07-2012

Not signed
AUTHORISED SIGNATORY
(EMPLOYEE CODE: 6008)



BIOTECH TESTING SERVICES

TEST REPORT

LAB NO. : 1902089/ 1 - 2

DATE: 07/12/2019

NAME OF CUSTOMER : M/S. ORIENT BELL LIMITED
ADDRESS : 8, A 76 to A 80, Industrial Area, Sikandrabad 203205,
UP, India
REFERENCE : Your Letter Ref: Nil dated November 21, 2019
Kind Attention: Amit kumar
DATE OF RECEIPT : 21/11/2019
DATE OF INITIATION : 21/11/2019
DATE OF COMPLETION : 07/12/2019
SAMPLE DESCRIPTION : Tiles specimen labeled as -

Sr. No.	Sample Code	Other details
1.	PGVT Tile	Untreated
2.	PGVT Tile	Treated

Name of Test:

Evaluation of Antimicrobial Activity of Tile sample

Name of Test Protocol:

JIS Z 2801: 2010

Test Organisms used for evaluating Antimicrobial activity:

1. Staphylococcus aureus ATCC 6538
2. Escherichia coli ATCC 8739

Test Conditions:

Neutraliser used : Buffered Saline with Tween 80 - 0.01 %
Contact Time : 24 hours at 37° C
Incubation Temperature : 37° C for Bacteria
Media and Reagent : Soyabean-casein digest agar for Bacteria

Results:
ANTIBACTERIAL ACTIVITY
1. Test Bacteria: Staphylococcus aureus ATCC 6538

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated : Conc. of Inoculum on untreated sample at 0 hours (A): 1.78×10^5			Log = 5.25	
Untreated : Conc. of Inoculum on untreated sample after 24 hour (B): 5.30×10^5			Log = 5.72	
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
PGVT Tile – Untreated	46000	4.66	1.06	91.32
PGVT Tile – Treated	5100	3.70	2.02	99.03

2. Test Bacteria: Escherichia coli ATCC 8739

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 1.64×10^5			Log = 5.21	
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 1.20×10^6			Log = 6.07	
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
PGVT Tile – Untreated	72000	4.85	1.22	94.00
PGVT Tile – Treated	11700	4.06	2.01	99.02

The Standard Antimicrobial value of Evaluation $R \geq 2.0$

COMMENT:

When tested as specified, Tile sample labeled PGVT Tile- Treated; **PASSES** the Quantitative Assessment of activity; PGVT Tile - Untreated; **FAILS** the Quantitative Assessment of activity for Staphylococcus aureus and Escherichia coli by JIS Z 2801: 2010 Test Method.



For BIOTECH TESTING SERVICES



Dr Shilpa U. Nair
Quality Manager
(Authorized Signatory)

1902089/1 - 2
Page 2 of 2

• Samples are not drawn by the laboratory • Result relate only to the samples tested
• This report shall not be reproduced except in full without prior permission of this laboratory



BIOTECH TESTING SERVICES

TEST REPORT

LAB NO. : 1902089/ 5 - 6

DATE: 07/12/2019

NAME OF CUSTOMER : M/S. ORIENT BELL LIMITED
ADDRESS : 8, A 76 to A 80, Industrial Area, Sikandrabad 203205,
UP, India
REFERENCE : Your Letter Ref: Nil dated November 21, 2019
Kind Attention: Amit kumar
DATE OF RECEIPT : 21/11/2019
DATE OF INITIATION : 21/11/2019
DATE OF COMPLETION : 07/12/2019
SAMPLE DESCRIPTION : Tiles specimen labeled as -

Sr. No.	Sample Code	Other details
5.	FT Tiles	Untreated
6.	FT Tiles	Treated

Name of Test:

Evaluation of Antimicrobial Activity of Tile sample

Name of Test Protocol:

JIS Z 2801: 2010

Test Organisms used for evaluating Antimicrobial activity:

1. Staphylococcus aureus ATCC 6538
2. Escherichia coli ATCC 8739

Test Conditions:

Neutraliser used : Buffered Saline with Tween 80 - 0.01 %
Contact Time : 24 hours at 37° C
Incubation Temperature : 37° C for Bacteria
Media and Reagent : Soyabean-casein digest agar for Bacteria

Results:

ANTIBACTERIAL ACTIVITY

1. Test Bacteria: Staphylococcus aureus ATCC 6538

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated : Conc. of Inoculum on untreated sample at 0 hours (A): 1.78×10^5				Log = 5.25
Untreated : Conc. of Inoculum on untreated sample after 24 hour (B): 5.30×10^5				Log = 5.72
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
FT Tile – Untreated	192000	5.28	0.44	63.77
FT Tile – Treated	4500	3.65	2.07	99.15

2. Test Bacteria: Escherichia coli ATCC 8739

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 1.64×10^5				Log = 5.21
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 1.20×10^6				Log = 6.07
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
FT Tile – Untreated	210000	5.32	0.75	82.50
FT Tile – Treated	10600	4.02	2.05	99.11

The Standard Antimicrobial value of Evaluation $R \geq 2.0$

COMMENT:

When tested as specified, Tile sample labeled FT Tile – Treated; **PASSES** the Quantitative Assessment of activity; FT Tile - Untreated; **FAILS** the Quantitative Assessment of activity for Staphylococcus aureus and Escherichia coli by JIS Z 2801: 2010 Test Method.

For BIOTECH TESTING SERVICES




Dr Shilpa U. Nair
Quality Manager
(Authorized Signatory)









1902089/5 - 6
Page 2 of 2

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TECHNICAL SPECIFICATIONS

Glazed Vitrified Tiles

Packing Details			
Size	No. of Tiles Per Carton	Covered Area Per Carton	
(In mm.)		(In Sq. Mtr.)	(In Sq. ft.)
600X600 (SKD)	4	1.44	15.5

Group B Ia as per ISO 13006:2012 and Group B Ib as per IS 15622:2017					
Characteristics	Test Methods	Requirement as per ISO 13006 ≤ 0.5 Group B Ia	Requirement as per IS 15622:2017 0.08<E ≤ 3% Group B Ib		OBL Norms
Dimension & Surface Quality	IS 13630 (Part 1):2006		Unrectified	Rectified	
Deviation in Length & Width		±0.6%	± 0.4%	± 0.1 %	± 0.1 %
Deviation in Thickness		±5%	± 5.0 %		± 4 %
Straightness of Sides		±0.5%	± 0.3 %	± 0.1 %	± 0.1 %
Rectangularity		±0.5%	± 0.3 %	± 0.1 %	± 0.1 %
Surface Flatness		±0.5%	± 0.5 %		± 0.2 %  
Surface Quality		Min. 95 % tiles should be free from visible defects	Min. 95 % tiles should be free from visible defects		Conforms
Physical Properties					
Water Absorption	IS 13630 (Part 2):2006	Avg ≤ 0.5, Individual max, 0.6	Avg 0.08<E ≤ 3, Individual 3.3, Max		Avg ≤ 0.5, Individual max, 0.6
Modulus of Rupture in [N/mm ²]	IS 13630 (Part 6):2006	Minimum 35, Individual 32, Min	Avg 30, Individual 27, Min		Avg 38 Min, Individual 35, Min  
Breaking Strength in N	IS 13630 (Part 6):2006	< 7.5 mm thickness: 700, Min ≥ 7.5 mm thickness: 1300, Min	< 7.5 mm thickness: 700, Min ≥ 7.5 mm thickness: 1100, Min		1500, Min  
Moisture Expansion in mm/m	IS 13630 (Part 3):2006	Declare Value	0.02, Max		< 0.02
Scratch Hardness of Surface (Moh's Scale)	IS 13630 (Part 13):2006	NA	5, Min		5 to 8 Depending on Design/Surface
Resistance to Surface Abrasion of Glazed Tiles (Class I to V)	IS 13630 (Part 11):2006	Test Method Available	Class II, Min		Class-III to Class-V Depending as per Design / Surface 
Co-efficient of Linear Thermal Expansion from Ambient Temperature to 100°C	IS 13630 (Part 4):2006	Test Method Available	7x10 ⁻⁶ K ⁻¹ , Max		Conforms
Thermal Shock Resistance	IS 13630 (Part 5):2006	Test Method Available	10 cycles, Min		Passed
Crazing Resistance	IS 13630 (Part 9):2006	Test Method Available	4 Cycles@7.5 bar, Min		4 Cycle @ 7.5 Bar Min 
Frost Resistance	IS 13630 (Part 10):2006	Required	Required		Resistance
Bulk Density, in (g/cc)	IS 13630 (Part 12):2006	NA	2.0, Min		> 2.1
Impact Resistance- Coefficient of Restitution	IS 13630 (Part 14):2006	Manufacturer to State	0.55, Min		0.7-0.85
Chemical Properties					
Resistance to Staining of Glazed Tiles	IS 13630 (Part 8):2006	Min, Class 3	Class I, Min		Conforms
Resistance to Household Chemicals		Min, GA	Class AA, Min		Conforms
Resistance to Acids and Alkalis (with exception of hydrofluoric acid and its compounds)		Test Method Available	Required, if agreed		Conforms

TECHNICAL SPECIFICATIONS

Digital Ceramic Wall Tiles

Packing Details

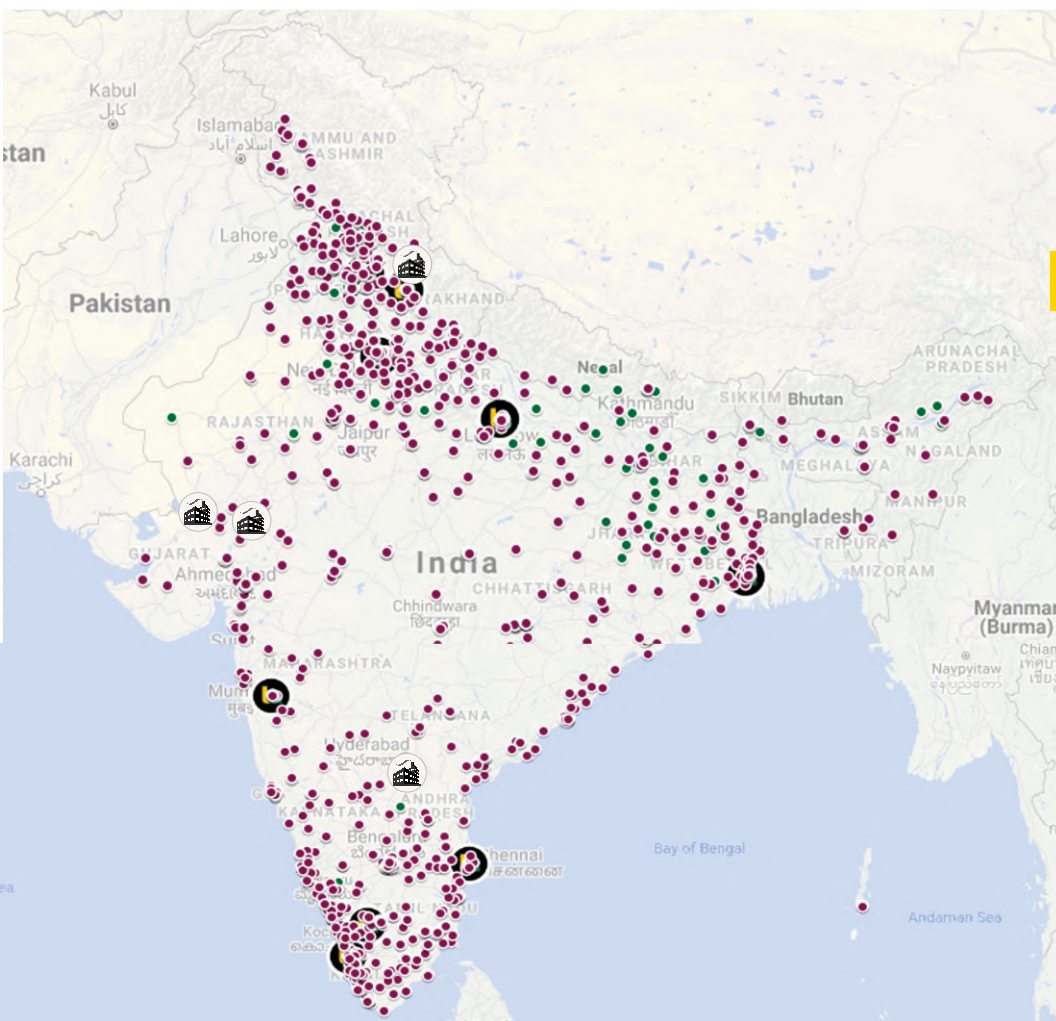
Size	No. of Tiles Per Carton	Covered Area Per Carton	
(In mm.)		(In Sq. Mtr.)	(In Sq. Ft.)
300X600	6	1.08	11.63
300X450	6	0.81	8.716

(E > 10 % Group B III) as per IS 15622:2017





Characteristics	Standard Test Method	IS 15622:2017 E > 10 % (Group B III)		OBL Norms
Dimension & Surface Quality		Unrectified	Rectified	
Deviation in Length & Width	IS 13630 (Part 1):2006	± 0.4%	± 0.2 %	Conforms
Deviation in Thickness		± 5.0 %		± 3.00 %
Straightness of Sides		± 0.2 %	± 0.15 %	Conforms
Rectangularity		± 0.3 %	± 0.2 %	Conforms
Surface Flatness		± 0.3 %		± 0.20 % 😊 😊
Surface Quality		Min. 95 % tiles shall be free from visible defects		Min. 95 % tiles shall be free from visible defects
Physical Properties				
Water Absorption (%)	IS 13630 (Part 2):2006	Average > 10 %		15±2 % 😊
Modulus of Rupture in [N/mm ²]	IS 13630 (Part 6):2006	Min 15, for thickness < 7.5 mm Min 12, for thickness ≥ 7.5 mm		>15 😊
Breaking Strength in N	IS 13630 (Part 6):2006	< 7.5 mm thickness: 200, Min ≥ 7.5 mm thickness: 600, Min		Conforms 😊
Moisture Expansion in mm/m	IS 13630 (Part 3):2006	0.04, Max		Conforms
Scratch Hardness of Surface (Moh's Scale)	IS 13630 (Part 13):2006	3, Min		>3
Resistance to Surface Abrasion of Glazed Tiles (Class I to V)	IS 13630 (Part 11):2006	Class II, Min		Conforms
Co-efficient of Linear Thermal Expansion from Ambient Temperature to 100°C	IS 13630 (Part 4):2006	9x10 ⁻⁶ K ⁻¹ , Max		Conforms
Thermal Shock Resistance	IS 13630 (Part 5):2006	10 cycles, Min		Passed 10 Cycle
Crazing Resistance Glazed Tiles	IS 13630 (Part 9):2006	4 Cycles@7.5 bar, Min		4 Cycle Passed 😊 😊
Impact Resistance- Coefficient of Restitution	IS 13630 (Part 14):2006	0.55, Min		>0.55
Chemical Properties				
Resistance to Staining of Glazed Tiles	IS 13630 (Part 8):2006	Class I, Min		Conforms
Resistance to Household Chemicals		Class AA, Min		Conforms
Resistance to Acids and Alkalis (with exception of hydrofluoric acid and its compound)		Required, if agreed		Resistant

Packing Details			
Size	No. of Tiles Per Carton	Covered Area Per Carton	
(In mm.)		(In Sq. Mtr.)	(In Sq. ft.)
300X300-Digital (SKD)	12	1.08	11.62

As Per Indian Standards (IS 15622:2017) Group B IIa				
Characteristics	Testing Methods	Required as per IS 15622:2017 3 < E ≤ 6 % (Group B II a)		OBL Norms
Dimension & Surface Quality	IS 13630 Part 1/ ISO 10545-2	Unrectified	Rectified	
Deviation in Length & Width		± 0.4 %	± 0.1 %	Conforms
Deviation in Thickness		± 5.0 %		± 4.0%
Straightness of Sides		± 0.3 %	± 0.1 %	Conforms
Rectangularity		± 0.3 %	± 0.1 %	Conforms
Surface Flatness		± 0.5 %		± 0.3 % 😊😊
Surface Quality		Min. 95 % tiles should be free from visible defects		Conforms
Physical Properties				
Water Absorption	IS 13630 Part 2/ ISO 10545-3	Avg 3 < E ≤ 6, Individual Max,6.2		5-6%
Modulus of Rupture in [N/mm ²]	IS 13630 Part 6/ ISO 10545-4	Avg 22, Individual 20, Min		>28 😊😊
Breaking Strength in N		< 7.5 mm thickness: 600, Min ≥ 7.5 mm thickness: 1000, Min		>1000 😊😊
Moisture Expansion in mm/m	IS 13630 Part 3	0.03, Max		< 0.03
Scratch Hardness of Surface (Moh's Scale)	IS 13630 Part 13	4, Min		Min 5
Resistance to Surface Abrasion of Glazed Tiles (Class I to V)	IS 13630 Part 11/ ISO 10545-7	Class II, Min		PEI Class 3-5 (depending on surface)
Co-efficient of Linear Thermal Expansion from Ambiant Temperature to 100°C	IS 13630 Part 4/ ISO 10545-8	9x10 ⁻⁶ K ⁻¹ ,Max		Conforms
Thermal Shock Resistance	IS 13630 Part 5	10 cycles, Min		Passed
Crazing Resistance	IS 13630 Part 9/ ISO 10545-9	4 Cycles@7.5 bar, Min		Passed 😊
Frost Resistance	IS 13630 Part 10	Required, if agreed		NA
Impact Resistance- Coefficient of Restitution	IS 13630 Part 14	0.55, Min		Conforms
Chemical Properties				
Resistance to Staining of Glazed Tiles	IS 13630 Part 8/ ISO 10545-13 and ISO 10545-14	Class I, Min		Conforms
Resistance to Household Chemicals		Class AA, Min		Conforms
Resistance to Acids and Alkalies (with exception of hydrofluoric acid and its compounds)		Required, if agreed		Conforms



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