

TILING SOLUTIONS FOR THE MOST DEMANDING ENVIRONMENTS



TILING SOLUTIONS FOR THE MOST DEMANDING ENVIRONMENTS

INDUSTRIAL COLLECTION

- 06** Plain Series 30x30cm - 1.2cm Thick
- 11** Color Series 30x30cm - 1.2cm Thick
- Textured Series 30x30cm - 1.2cm Thick
- Plain Series 20x10cm - 1.2cm Thick
- 17** Plain Series 30x30cm - 1.5cm Thick
- 21** Plain Series 20x20cm - 1.5cm Thick
- Plain Series 20x10cm - 1.5cm Thick
- 25** Plain Series 30x30cm - 2cm Thick
- Plain Series 20x10cm - 2cm Thick
- 38** Anti-Static Series 30x30cm - 1cm Thick
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METEOR COLLECTION

- 49** 60x60cm - 1.5cm Thick
- 53** 60x60cm - 2cm Thick



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TILING SOLUTIONS FOR THE MOST DEMANDING ENVIRONMENTS



Facts of life in an industry :

Vrooming forklifts, thumping of machines, extreme temperatures, occasional spillage of liquids, oil or acids, continuous heavy pedestrian and hard-wheeled trolley traffic...

Industrial Tile Collection



Facts about Endura Heavy Duty Industrial Tiles :

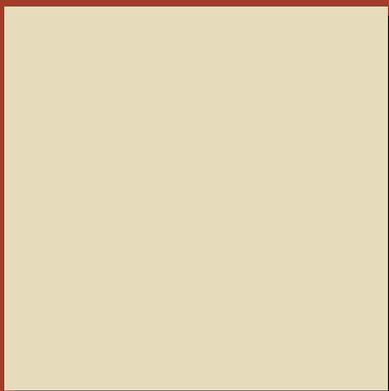
Extra tough, non-abrasive, acid/alkali resistant Endura industrial tiles are designed to withstand the extreme demands of industrial manufacturing areas. Indestructible and extremely durable, the compressive strength of Endura tiles is several times higher than that of reinforced concrete. Being acid and alkali resistant (as per IS 4457 and conforming EN/ASTM/DIN & ISO Standards) Endura tiles can withstand the most corrosive of chemicals. Furthermore being anti-skid ensures safety of workers and also minimizes loss of productivity caused by accidents. Easy to clean and maintain Endura tiles are a must for warehouses, food, chemical, petrochemical, pharmaceutical and other similar industries where the flooring is constantly prone to fluid spillage.

Endura industrial tiles are available in 3 convenient sizes – 20x 10cm, 20 x 20cm and 30 x 30cm and thicknesses of 1.2cm, 1.5cm and 2cm. Small size enables ease of application, repair and maintenance of floors and makes it ideal for cladding vertical surfaces.

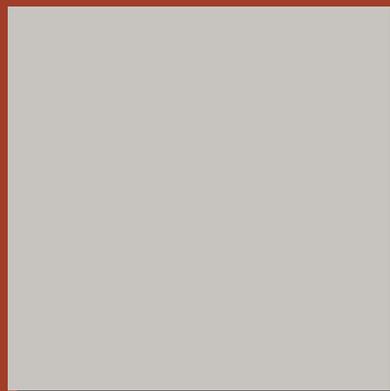


30x30cm Grey - 1.2cm Thick

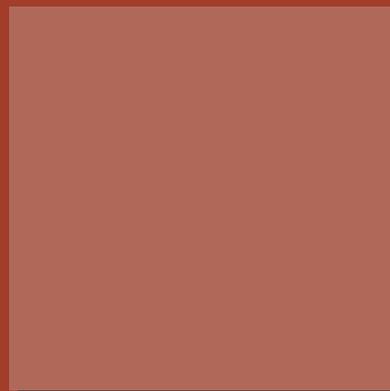
Textile Stitching Plant



Ivory **D/K**



Grey **D/K**



Terracotta **D/K**

1.2cm Thick

D Deras D/K Deras & Kunigal

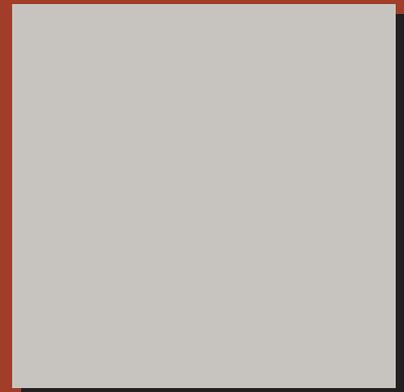
Plain Series - 30x30cm



Majorda D



Benaulim D



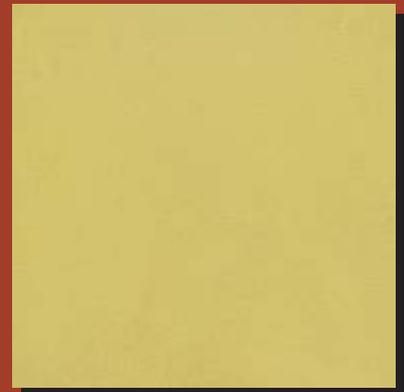
Grey Plus D



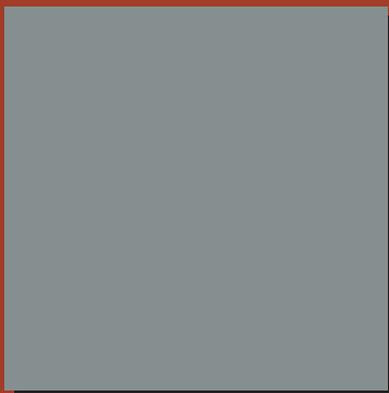
To Blue Plus D



To Green Plus D



To Yellow Plus D



Silver Grey Plus D

Textile Plant



Food Processing Plant

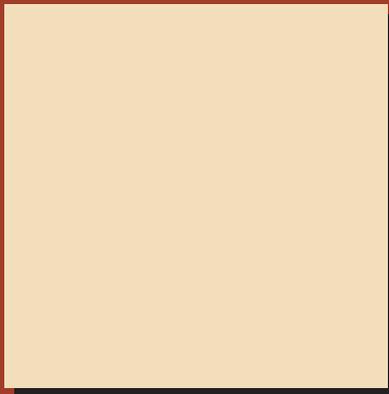




1.2cm Thick

Dewas

Color Series - 30x30cm



Super Ivory



Coated Grey Plus



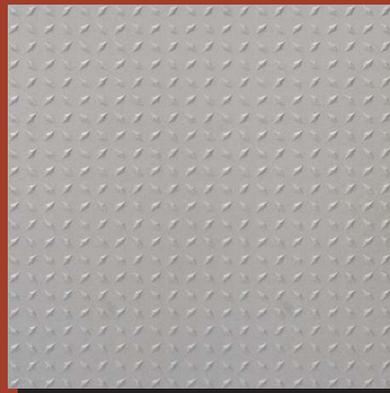
White Plus



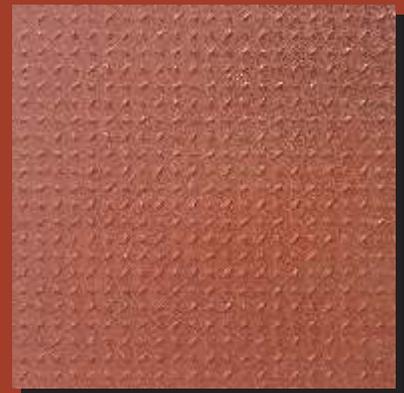
Textured Series - 30x30cm



Checkered Ivory



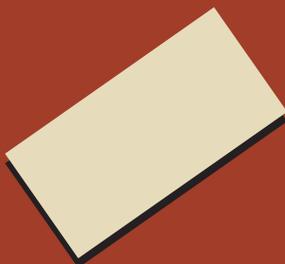
Checkered Grey



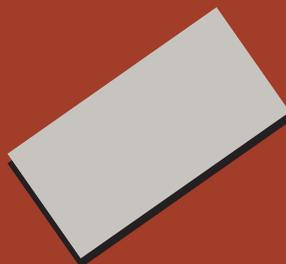
Checkered Terracotta



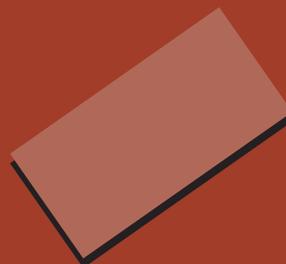
Plain Series - 20x10cm



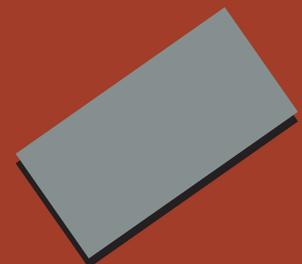
Ivory



Grey



Terracotta

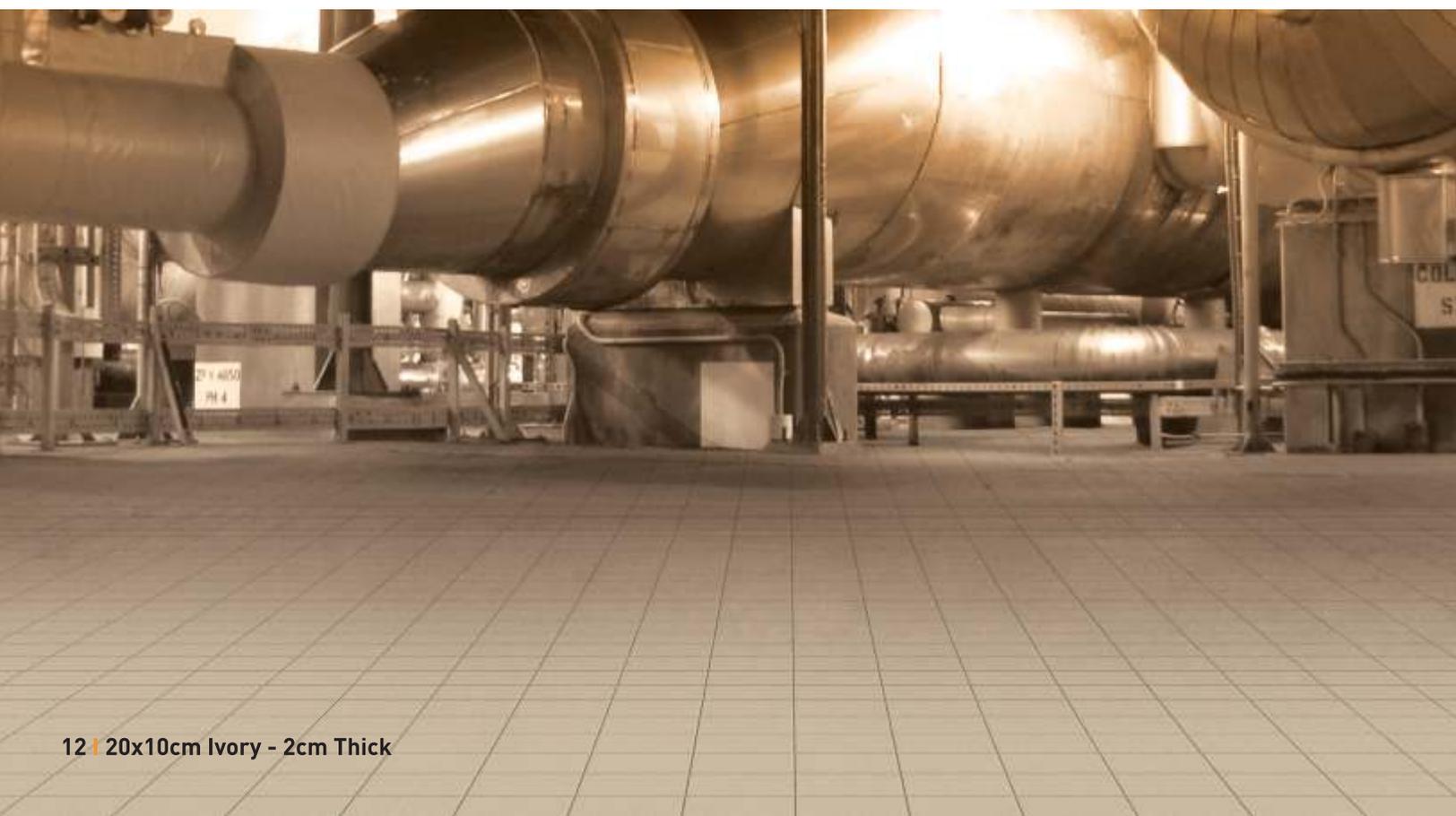


Silver Grey





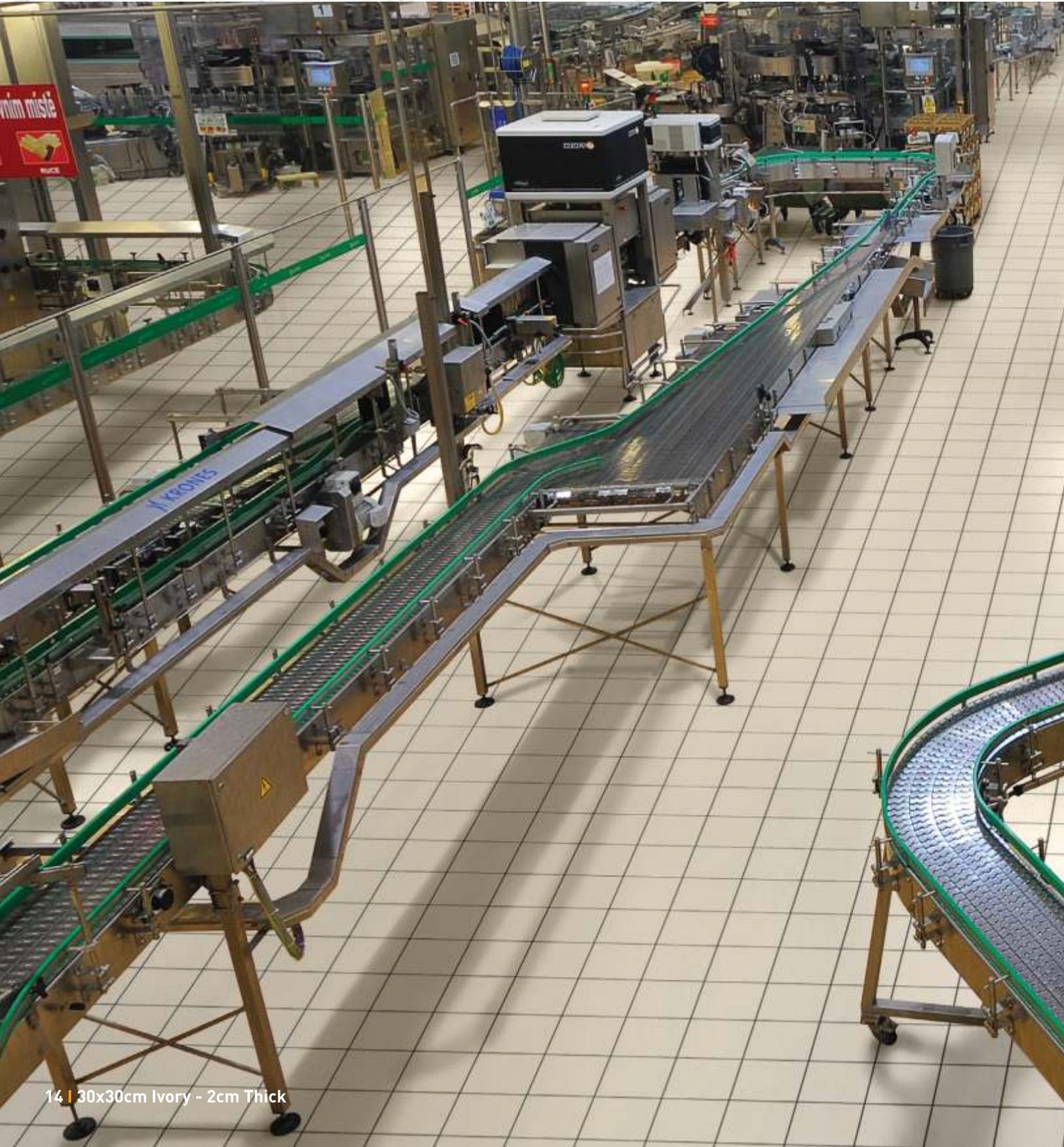
20x10cm Ivory & Terracotta - 2 cm Thick



12 | 20x10cm Ivory - 2cm Thick

Chemical Plant





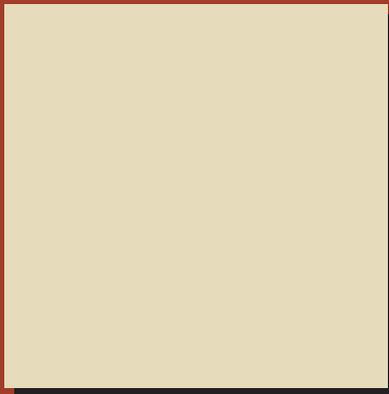




1.5cm Thick

Dewas

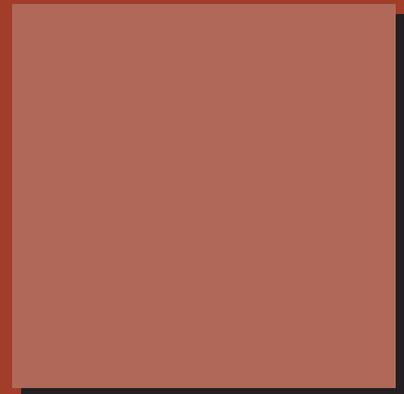
Plain Series - 30x30cm



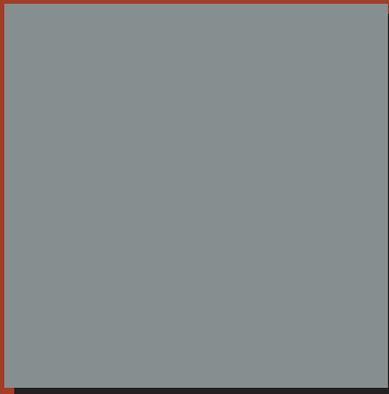
Ivory



Grey



Terracotta



Silver Grey Plus



Silver Grey Plus SPL

Automobile Industry



Workshop

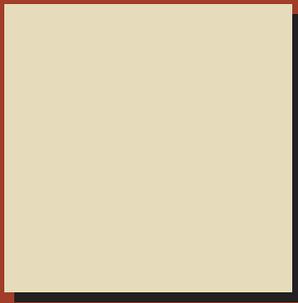




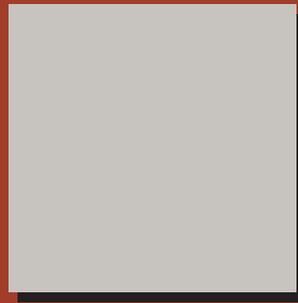
1.5cm Thick

Dewas

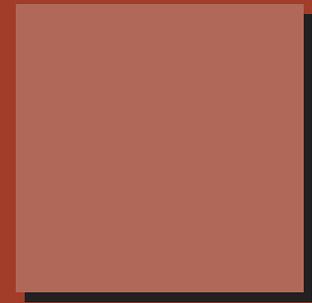
Plain Series - 20x20cm



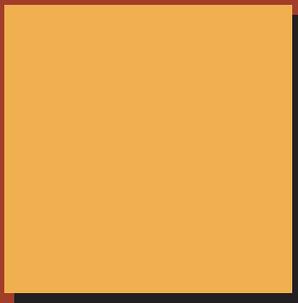
Ivory D



Grey D



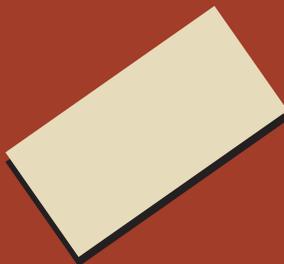
Terracotta D



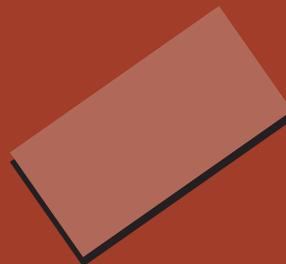
Yellow D



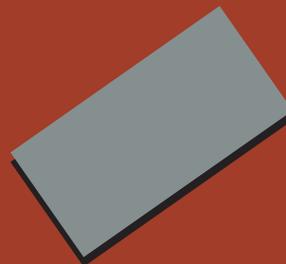
Plain Series - 20x10cm



Ivory D



Terracotta D



Silver Grey D



Food Industry



Warehouse & Dispatch Area

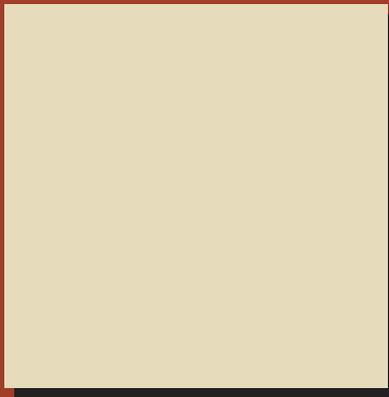




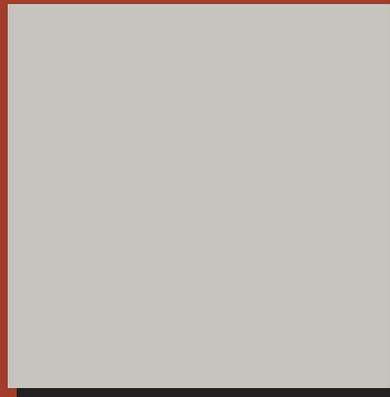
2cm Thick

Dewas

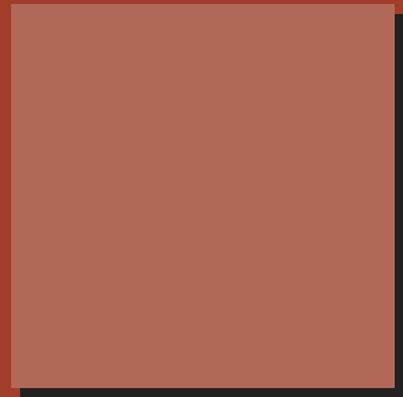
Plain Series - 30x30cm



Ivory D

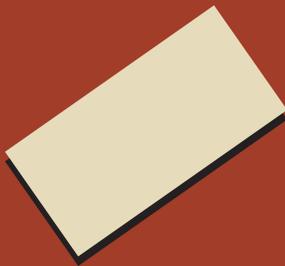


Grey D

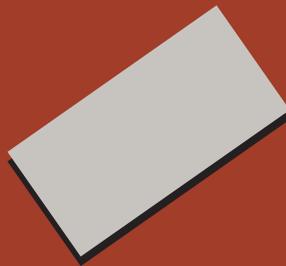


Terracotta D

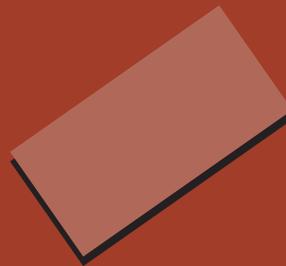
Plain Series - 20x10cm



Ivory D



Grey D



Terracotta D



Breweries





Power Plant





Laboratories



Air Hangar







Industrial Series

Features	Advantages	Benefits
Higher breaking strength 1.2cm - >2500N, 1.5 cm - >4000N, 2 cm - > 7500 N	Higher breaking strength performs the function of transferring large loads effectively down to the bedding underneath without breaking.	Customer is benefitted with a strong and durable floor with no maintenance.
High Mohs Hardness >7	Mohs is a measure to test surface scratch hardness value on a relative scale from 1 to 10. Higher the value, more the hardness, thus protecting the surface from scratches. Mohs value of > 7 ensures Endura Industrial tiles do not get scratched even with metals thus providing a tough, rigid, floor without scratches especially on continuous use & even during maintenance activities.	Customer is benefitted by enhanced long lasting aesthetic beauty due to scratch free surface.
High Abrasion Resistance. Deep Abrasion Volume Loss <144 mm ³	Johnson Endura Industrial tiles have the highest abrasion resistance value when compared with other traditional floors like VDF, Natural Stones, Epoxies, PU, PVC etc, thus ensuring lowest possible abrasion & wear off.	This helps customers maintain aesthetic value of floor year on year and avoid recurring maintenance costs.
Matt Finish Skid Resistance Floor – Coefficient of Friction > 0.6	Provides reasonably good traction to vehicles, pedestrians, material carrying carts, fork lifts, trolleys.	Customer benefitted by a safe floor meeting Industrial safety norms.
Stain resistance	Provides sufficiently good stain resistance property to effectively maintain the matt finish floor.	Helps in maintaining good housekeeping norms.
Low water absorption < 0.5%	Ensures compact body thus preventing stains & percolation of liquid based media.	Helps in maintaining good housekeeping norms.
For Acid Resistant flooring		
Resistance to concentrated Acid – Weight loss < or = 1%	Extremely high acid resistance of Johnson Endura Industrial tiles (1.2, 1.5 & 2 cm) meeting the stringent specification norms of IS 4457:2007 ensure excellent performance in Acid/Chemical/Alkali (except HF acid and its derivatives) attack area thus helping corrosion protection of reinforcement in concrete & protecting erosion of the structure.	Customer benefitted by the long service life of the structure and enhanced safety. Application areas of pollution control & corrosion protection, lend themselves well to Johnson Endura Industrial tiles.

Comparison of Kota Stone, Mandana, Epoxy and Endura Industrial Tiles

Features / Flooring Material	Kota Stone	Mandana Stone	Epoxy Flooring	Endura Industrial Tiles
Main Constituents	Limestone or Calcite	Quartzitic Sandstone	Organic Copolymers	Inorganic oxides
Flexural Strength (N/mm ²)	20-25	25-30	25-35	>38
Water Absorption	2% to 4%	1% to 2%	0.2% to 0.5%	<0.5%
Bulk Density (g/cm ³)	2.1 to 2.3	2.3 to 2.5	2.1	2.4
Slipperiness	Polished surface is slippery	Less Slippery	Slippery	Antiskid with co-efficient of friction > 6
Acid-Alkali Resistance	Not Resistant to Acids	Not Resistant to Alkali	Not Resistant to Acids	Resistant to Acids & Alkali
Shear Resistance	Low	Low	Very Low	High
Resistance to heavy duty hard wheel trolley movement	Low	Low	Very Low	High
Scratch Resistance (Mohs Scale)	3 to 4	5 to 6	4 to 5	>7
Fire Resistance	Moderate	Good	Inflammable	Fire Proof
Maintenance Cost	High	High	Very High	Low
Service Life	5 years	5 years	1 year	10 years
Shade Variation	High	High	Very Low	Low
Environment friendliness	Requires extensive mining and destroys natural resources	Requires extensive mining and destroys natural resources	NA	Environment friendly and adherence to ISO 14001 standards
Production & Working Conditions	Very Hazardous. Unorganized.	Very Hazardous. Unorganized.	Adherence to ISO 18001 standards	Adherence to ISO 18001 standards
Safety Standards	No safety standards	No safety standards	Complies with all safety gear requirements as per ISO 18001 healthy & safety standards	Complies with all safety gear requirements as per ISO 18001 healthy & safety standards
Waste Disposal	Disposal in open land without any treatment	Disposal in open land without any treatment	Effluent treatment as per ISO 14001 standards	Effluent treatment as per ISO 14001 standards
Child Labor	Employed	Employed	No Child Labor	No Child Labor
Labor Exploitation	Yes. Day-Night shifts with below minimum wages	Yes. Day-Night shifts with below minimum wages	Safe & good working conditions. Adhering to Minimum Wage Act	Safe & good working conditions. Adhering to Minimum Wage Act
Ecological Imbalance	Extensive digging / mining can lead to earthquakes	Extensive digging / mining can lead to earthquakes	NA	NA
Sizes	2 x 1.5, 2 x 2	2 x 1.5, 2 x 2, 2 x 2.5	NA	20x10cm-1.2cm, 30x30cm-1.2cm, 20x10cm-1.5cm, 20x20cm-1.5cm, 30x30cm-1.5cm, 20x10cm-2cm

Benefits of Endura Industrial Tiles

Johnson Endura Industrial Tiles	AR Bricks
Johnson Endura tiles conform to IS 4457 (Stringent Specification).	AR Bricks conform to IS 4860 Specification.
Lowest water absorption (<0.5%). Acid cannot percolate through tile body, thereby leaving the bedding underneath intact for years.	Water absorption between 3% to 5%. High porosity and hence, acid or chemical percolation is possible resulting in corrosion of the bedding material underneath.
Johnson Endura has a vitrified tile body with compact mass that provides high strength. Thus with the recommended 1.2, 1.5 & 2 cm thick tiles, overall structural load can be reduced.	AR bricks are ceramic tiles with high porosity and low strength, requiring the need for a high thickness of 38 mm that results in increased structural load.
Mohs hardness of Endura is >7 making the surface virtually scratch proof. Even metals like hardened steel used in trolley etc. cannot scratch the tile.	Mohs hardness scale of AR brick is 5 to 6 making it prone to scratches and flaking.
Endura Industrial tiles are available in a variety of sizes and thicknesses 30x30cm - 2cm, 20x10cm - 2cm, 30x30cm - 1.5cm, 20x10cm - 1.5cm, 30x30cm - 1.2cm, 20x10cm - 1.2cm	AR bricks are typically available in one fixed size of 9in x 4in - 38 mm.
Johnson Endura Industrial Tiles	Epoxy Floorings
High traction resistance. Excellent performance under continuous vehicular traffic without any erosion.	Poor traction resistance. Gets scratched and wears off with continuous vehicular traffic movement.
Very high breaking strength. Suitable for heavy loads with hard-wheel trolley movements.	High wear and tear on use of hard-wheel heavy load trolley movements.
Very high scratch resistance. MOH scale >7. Even metals cannot scratch the tiles.	Prone to scratches. MOH hardness 4-5.
Highest abrasion resistance amongst all flooring options with abrasion value of < 144 mm ³ (ISO 13006/EN 176). Retains aesthetics for a long time.	Low abrasion resistance. Leads to high wear & tear on continuous use.
Can withstand point loads.	Cannot take point loads.
Ease of repair and maintenance. Even a single damaged tile can be replaced quickly without affecting surrounding tiles.	Repair and maintenance is difficult. Repairing the affected area gives the floor a patchy incongruent look.
Johnson Endura is maintenance free and is a very durable floor covering.	Epoxy floors have a huge recurring cost for maintenance, along with workshop shut down costs and inconvenience.
Johnson Endura Industrial tiles are highly durable, maintenance free, scratch proof, economical, and on aesthetic flooring option for industrial shop floors.	Epoxyes are aesthetic, but delicate and expensive in the long run.
Johnson Endura Industrial Tiles	Kota & Other Natural Stones
Properties are homogeneous across the entire body of tile. Shades are fairly consistent across the tile.	As natural stones are mined, their properties may vary from stone to stone and also within a stone. They are also prone to a high degree of shade variation.
Compact body with low water absorption of < 0.5%.	Very high porosity. Water absorption may vary from 2-4%.
High traction resistance.	Poor traction resistance.
Very high breaking strength. Suitable for heavy loads with hard-wheel trolley movements.	Susceptible to breakage on heavy load (> 1 ton) movement with hard-wheel trolleys.
Very high scratch resistance. MOH scale >7. Even metals cannot scratch the tiles.	Prone to scratches. MOH hardness 4-5.
Highest abrasion resistance amongst all flooring options with abrasion value of < 144 mm ³ (ISO 13006/EN 176). Retains aesthetics for a long time.	Low abrasion resistance. Leads to high wear & tear with continuous use.
Use of 12 to 20 mm thickness ensures low structural load with high performance.	Use of higher thickness increases weight and structural load.



60x60cm AS Blue - 1cm Thick

Johnson Endura, the industrial tiling solution provider has looked into very niche but highly important areas, which are sensitive to static electricity. Johnson Endura Anti-Static Tiles have been specially developed for such areas :

Fire Hazardous Areas :

Anti-static Dissipative type : (Surface Resistance between 1 Mega Ohm to 1 Giga Ohm)
Static electricity accumulates on the surface of any floor be it natural stone, ceramic tile or any other flooring material. This static electricity is accumulated due to the friction between any two surfaces like shoes and the floor. This static electricity could lead to sparks which could lead to fire hazards in areas like petrochemical industries, shell making factories, ordnance factories, defence industries, chemical plants, bulk drug plants and other fire prone areas. Johnson Endura Anti-static tiles remove the static electricity charge from the surface of the tile and earth it; and hence the fire hazard is minimized.

Electronic Equipment Areas :

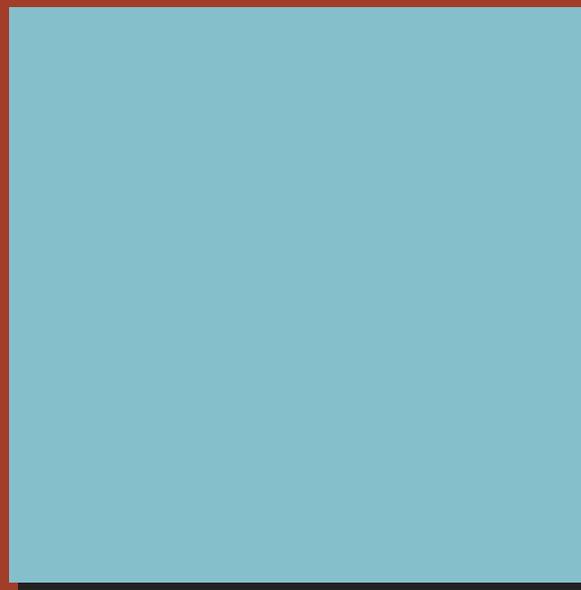
Anti-static Conductive Type: (Surface Resistance below 1 Mega Ohm)
Anti-static tiles are also used for server rooms, computer rooms & electronic equipment rooms where static electricity can damage the working of electronic equipments.

Application Areas :

Server Rooms, Petrochemical Factories, Ordnance Factories, Chemical Plants, Bulk Drug Plants, Fire Prone Areas, Computer Rooms, Electronic Equipment Rooms, PLC Panel Rooms, PCB Manufacturing, IT Industry, Sophisticated Equipment Laboratories, Shell Making Factories, Defence Factories, Hospital Operation Theatres.



Anti-Static Series 60x60cm



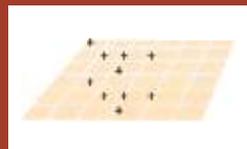
AS Blue P



Working of antistatic tiles



Normal Floor



Static Electricity after friction



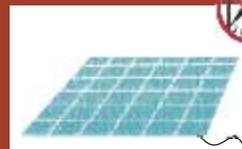
Possibility of fire hazard



Can damage electronic equipment



Endura Anti-Static Floor



Static Electricity is earthed



No fire hazard



Eliminates possibility of damage



Anti-Static Series

Features	Advantages	Benefits
Surface Electrical Resistance – Conductive <1 Mega Ohm & Dissipative – 1 Mega Ohm to 1 Giga Ohm	Surface electrical resistance being the property of material decides the nature of product in terms of its charge conductance. Surface Electrical resistance as per ANSI norms ensures smooth transfer of accumulated static charge to grounding path.	Static hazard-free area resulting in smooth uninterrupted functioning of critical equipments. Helps in mitigating fire hazard from floor due to static charges.
Static decay Time – Conductive - <0.5 sec Dissipative - <0.5 sec	Static decay time as per ANSI norms ensure smooth discharge of accumulated static electricity from the surface.	Compliance with critical requirement of such sensitive areas. Static Hazard free area resulting in smooth uninterrupted functioning of critical equipments. Helps in mitigating fire hazards from floors due to static charges.
Firm & Effective Grounding of Floors	Vitrified anti-static tiles help provide firm and permanent grounding.	Assures Anti Static property throughout the service life of product.
60x60cm Matt finish AS Blue Tile	Bigger size offers lesser joints. Matt finish with anti-skid elegant floor in blue shade.	Customer benefitted by safe floor to meet industrial safety norms along with excellent aesthetic ambience.
Stain Resistance	Provides sufficiently good stain resistance property to effectively maintain the matt finish floor. Being a glazed vitrified tile, the tile is virtually stain proof	Helps in maintaining good housekeeping norms.
Johnson Endura Anti-Static Tiles Patented Product	In ceramic tile industry, whereas all products are insulators, Johnson Tiles have developed a special patented product for their customers to address the specific concerns on ESD hazard.	Customer benefitted by the best and only product from ceramic industry which not only offers protection from ESD hazards but also provides excellent service life due to its mechanical properties.







Application Areas

Industrial

- Chemical Plants
- Power Plants
- Air Hangers
- Food Processing Units
- Breweries
- Factory Floors
- Automobile Workshops
- Pharma Units
- Steel Plants
- Textile Units
- Cement Plants
- Showroom Floors
- Parking Areas
- Depots & Warehouses
- Forklift Movement Areas
- Material Handling Areas
- Processing Units
- Galas
- Storage Units

Anti-Static

- Server Rooms
- Petrochemical Factories
- Ordnance Factories
- Chemical Plants
- Bulk Drug Plants
- Fire Prone Areas
- Computer Rooms
- Electronic Equipment Rooms
- PLC Panel Rooms
- PCB Manufacturing
- IT Industry
- Sophisticated Equipment Laboratories
- Shell Making Factories
- Defence Factories
- Hospital Operation Theatres

**TILING SOLUTIONS
FOR THE MOST
DEMANDING
ENVIRONMENTS**



METEOR Tile Collection



Endura Meteor promises you a strong & beautiful outdoor.

Johnson Endura Meteor collection is the most recent addition to the Endura product portfolio. These 60 X 60 cm tiles are of 1.5 cm & 2 cm thickness and are perfect for gardens, pathways, swimming pool decks, verandah/porches, public places & corridors. They are an ideal combination of performance, looks and versatility.

Johnson Endura Meteor tiles are more suitable than standard flooring alternatives like concrete tiles, paver blocks, natural stones etc. making it the best choice for outdoor usage. The exceptional features of Endura meteor do not diminish with the passage of time and can be fitted by using one of the following tile fixing method- raised flooring with support, directly on top of gravel/soil/sand or using the traditional solution with adhesive.



1.5cm Thick

JOHNSON
ENDURA
INDUSTRIAL TILING SOLUTIONS

Pen

60x60cm



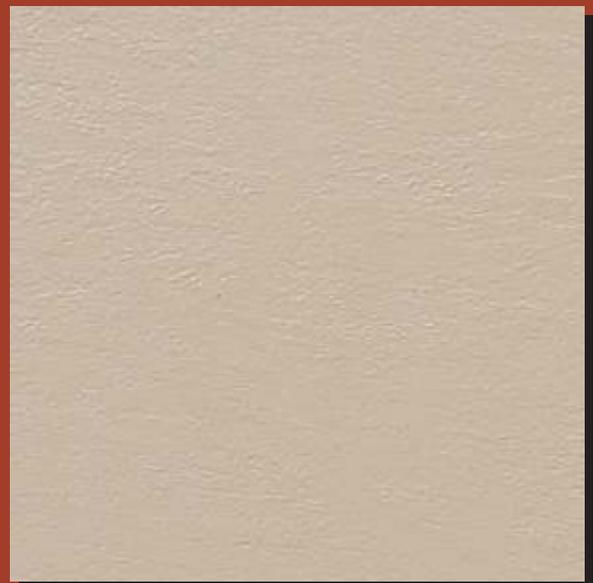
Slate White Pen



Slate Ivory Pen



Quartzite White Pen



Quartzite Ivory Pen



Plain Donapaula

60x60cm



Plain Donapaula 

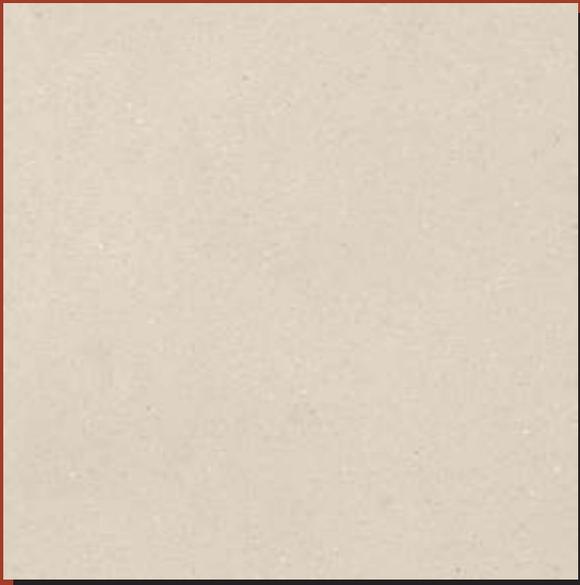


Plain Benaulim 

1.5cm Thick

JOHNSON[®]
ENDURA
INDUSTRIAL TILING SOLUTIONS

P Pen



Plain White **P**



Plain Grey **P**



Ozran **P**



Kreo Ivory



52 | Korneto Gris

2cm Thick

JOHNSON[®]
ENDURA
INDUSTRIAL TILING SOLUTIONS

▣ Dewas

60x60cm



Kreo Ivory ▣



Kreo Terra ▣



Kreo Gris ▣



Korneto Gris ▣



2cm Thick

JOHNSON[®]
ENDURA
INDUSTRIAL TILING SOLUTIONS

Dewas

60x60cm



Korneto Ivory D



Korneto Beige D



Meteor Series

Features	Advantages	Benefits
High Abrasion Resistance. Deep abrasion volume loss <144 mm ³	Johnson Endura Meteor tiles have the highest abrasion resistance value when compared with other traditional floors like concrete tiles, paver blocks, natural stones etc, thus ensuring lowest possible abrasion & wear off.	This helps customer maintain aesthetic value of floor year on year and avoid recurring maintenance costs.
Harsh weather & UV Resistance - Neutral to the Sun's UV effect	No fading of floor colors	Ideal for external flooring.
Easy to Install	Quick & easy fixing in least possible time with less cumbersome process. Three ways: 1.Raised flooring with supports (accessible underneath floor). Can be reused & refitted. 2.On top of gravel (bank gravel i.e. river run, crushed stone/ fine gravel) or compacted soil. Can be reused & refitted. 3.Cement sand mortar / adhesive system.	Quick completion of project.
Acid Alkali Resistant	Any spills or stains can be easily cleaned with commercial acids or alkalis (except HF and their derivatives)	Ideal for flooring in extreme weather conditions. Also helps in getting newer look over a period of time by acid wash on floor affected by stains due to uncontrolled external use.
High MOH Hardness (>6)	MOH is a measure to test surface scratch hardness value on a relative scale from 1 to 10 Higher the value, more the hardness, thus protecting the surface from scratches. MOH value of > 6 ensures these do not get scratched even with coarser sand, stone grits etc thus providing a tough, rigid, floor without scratches especially on continuous use & vehicular traffic.	Enhanced long lasting aesthetic beauty due to scratch free surface .
Higher breaking strength	Endura Meteor tiles can take large loads, high pedestrian traffic much better than stone & concrete tiles in a variety of outdoor / indoor applications without giving away .	Suitable for high load and heavy traffic usage.
Stain resistance	Provides sufficiently good stain resistance property making the surface impervious to dusts, stains and external liquid agents .	Retains aesthetics.
Low water absorption < 0.5%	Ensures compact body thus preventing stains & percolation of liquid based media .	Helps in maintaining good housekeeping norms.

Technical Specifications

Industrial Series

S. No.	Test Description	IS 4457:2007	Industrial Tiles		
			1.2cm	1.5cm	2cm
A) Dimension Quality					
1	Length & Width	±0.75%	±0.6%	±0.6%	±0.6%
2	Thickness	±5%	±5%	±5%	±5%
3	Straightness of Sides	±0.5%	±0.4%	±0.4%	±0.5%
4	Rectangularity	±0.6%	±0.5%	±0.5%	±0.5%
5	Surface Flatness	±0.5%	±0.3%	±0.3%	±0.3%
B) Physical Properties					
1	Water Absorption	< 0.5%	< 0.5%	< 0.5%	< 0.5%
2	Mohs Hardness		>7	>7	>7
3	Flexural Strength (Average MOR)	>35N/mm ²	>38N/mm ²	>38N/mm ²	>38N/mm ²
4	Breaking Strength	≥1300N	>2500N	>4000N	>7500N
5	Abrasion Resistance/Deep Abrasion	<175mm ³	<144mm ³	<144mm ³	<144mm ³
6	Skid Resistance	>0.4	>0.6	>0.6	>0.6
7	Density (gm/cc)	>2	>2.2	>2.2	>2.2
8	Moisture Expansion	Nil	Nil	Nil	Nil
C) Chemical Properties					
1	Resistance to Conc. Acid (wt. Loss)	< 1.5 %	≤1 %	≤1 %	≤1 %
2	Resistance to Household Chemicals & Swimming Pool Salts	Resistance	Resistance	Resistance	Resistance
3	Stain Resistance	Resistance	Resistance	Resistance	Resistance
D) Thermal Properties					
1	Thermal Expansion	<9 x 10 ⁻⁴ K ⁻¹			
2	Thermal Shock Resistance	No damage	No damage	No damage	No damage

Anti-Static Series

S.No.	Test Description	International Std. ISO 13006, Group Bia	Johnson Endura Industrial Tiles: Anti-Static Value	Test Method
1	Deviation in Length & Width	±0.6%	±0.1%	ISO 10545-2
2	Deviation in Thickness	±5%	±4%	ISO 10545-2
3	Straightness of Sides	±0.5%	±0.1%	ISO 10545-2
4	Rectangularity	±0.6%	±0.2%	ISO 10545-2
5	Surface Flatness	±0.5%	±0.2%	ISO 10545-2
6	Water Absorption	< 0.5%	< 0.05%	ISO 10545-3
7	Flexural Strength (Average MOR)	>35N/mm ²	>38N/mm ²	ISO 10545-4
8	Breaking Strength	>1300N	>1700N	ISO 10545-4
9	Resistance to Surface Abrasion	1 to V	PEI class III	ISO 10545-7
10	Bulk Density, in (g/cc)	>2	>2	DIN 51082
11	Linear Thermal Expansion	<9 x 10 ⁻⁶ K ⁻¹	<9 x 10 ⁻⁶ K ⁻¹	ISO 10545-8
12	Thermal Shock Resistance	No damage	No damage	ISO 10545-9
13	Frost Resistance	Frost proof	Frost proof	ISO 10545-12
14	Resistance to Chemicals (Acid & Alkalis)	Resistant	Resistant	ISO 10545-13
15	Moisture Expansion	Nil	Nil	ISO 10545-10
16	Surface Electrical Resistance (ANSI Norms)	Below 1 Mega Ohm (Conductive)	< 50 Kilo Ohm	ANSI ESD S7.1
		Between 1Mega Ohm to 1Giga Ohm (Dissipative)	1Mega Ohm to 1Giga Ohm	
	Static Decay Time	<0.5 Sec (Conductive)	<0.5 Sec	MIL-B-8170 Para 4.8.3 & FED-STD- 101C Method 4046
	< 2 Sec (Dissipative)	<0.5 Sec		

Technical Specifications

Meteor Series

S. No.	Test Description	Endura 60 x 60 cm - Rectified		Test Method
		1.5cm	2cm	
Dimensional Properties				
1	Length & Width	±0.1%	±0.1%	IS 4457:2007 Annex B / IS 15622:2006
2	Thickness	±5%	±5%	
3	Straightness of sides	±0.1%	±0.1%	
4	Rectangularity	±0.1%	±0.1%	
5	Surface flatness	±0.2%	±0.2%	
6	Surface Quality	Minimum 95% of the tiles shall be free from visible defects		
Physical Properties				
7	Water absorption	< 0.5%	< 0.5%	IS 4457:2007 Annex C / IS 15622:2006
8	Mohs Hardness	>6	>6	IS 13630 Part 13
9	Flexural strength (average MOR)	>38 N/mm ²	>38 N/mm ²	IS 4457:2007 Annex D / IS 15622:2006
10	Breaking Strength	>6000N	>8000N	
11	Abrasion resistance/Deep abrasion	<144mm ³	<144mm ³	IS 4457:2007 Annex E / IS 15622:2006
12	Skid Resistance	>0.6	>0.6	ASTM C1028-7
13	Density (gm/cc)	>2.2	>2.2	ASTM C373-16
14	Moisture expansion	Nil	Nil	ISO 10545-10
Chemical Properties				
15	Resistance to household chemicals & swimming pool salts	Resistant	Resistant	IS 4457:2007 Annex F / IS 15622:2006
16	Resistance to Conc. Acid (wt. Loss)	≤ 1 %	≤ 1 %	IS 4457:2007 Annex G
17	Stain resistance	Min. Class 3	Min. Class 3	ISO 10545-14
Thermal Properties				
18	Thermal expansion	<9 x 10 ⁻⁶ K ⁻¹	<9 x 10 ⁻⁶ K ⁻¹	ISO 10545 -8
19	Thermal shock resistance	No damage	No damage	ISO 10545 -9

Packing Details

Product	Nominal Size (cm)	No. of Tiles/box	Approx. Area/box (sq.m)	Approx. Weight/box (kg)	Approx. Cortons/20' Container	Approx. Area/20' Container (sq.m)	Approx. Boxes/16T Truck	Approx. sq.m/16T Truck
Hi-Traffic								
1cm Thick								
60X60R	60x60	4	1.44	30	733	1056	533	768
Industrial								
1.2cm Thick								
20X10	20X10	30	0.6	16.5	1344	806	970	582
30X30R	30X30	8	0.72	19	1296	933	842	606
1.5cm Thick								
20X10	20X10	20	0.4	13.7	1440	576	1168	467
20X20R	20X20	15	0.6	21.5	1152	691	744	447
30X30R	30X30	6	0.54	18.5	1296	700	865	467
2cm Thick								
20X10	20X10	20	0.4	17	1344	538	941	376
30X30R	30X30	5	0.45	20	1296	583	800	360
Anti-Static Series								
1cm Thick								
60X60R	60x60	4	1.44	29.2	753	1084	548	789
Meteor								
1.5cm Thick								
Pen Plant	60X60	3	1.08	35	700	756	457	494
2cm Thick								
Dewas Plant	60X60	2	0.72	31.5	576	415	508	366

FAQ's

Q1. What is Endura?

A. Endura is brought to you by H & R Johnson (India), the country's largest manufacturer of Industrial, Pavement and Specialty tiles such as Swimming pool tiles, Anti-Static tiles, Tac tiles etc. Endura offers virtually all types of interior and exterior tiling solutions.

Q2. What are the benefits of Johnson Endura Sandex compared to Marble and Granite?

Parameter	Italian Marble	Natural Granite	Johnson Endura Sandex	Benefits of Johnson Endura
Porosity	Very high	Medium porosity	Very low porosity	High chemical & stain resistance, clean & hygienic, (Bacteria resistant).
Water absorption	>5%	>1%	<0.5%	
Flexural strength	6.3 N/mm ²	13.8 N/mm ²	>35 N/mm ²	High strength, durability. Maintenance free.
Abrasion resistance	350 mm ³	180 mm ³	< 144 mm ³	
Hardness on Mohs scale	4	6	>7	Aesthetically superior.
Colour & design variation	Very high	High	Low	
Polish	Tin Oxide polish. Poor durability.	Surface polish. Medium durability.	Unpolished matt finish. High durability.	Polished finish is long lasting.
Laying / installation	Time consuming process. Assorting required.	Time consuming process. Assorting required.	Pre – sized, easy & faster to install.	Ready to use. Easy to lay.
Discolouring (Becomes yellowish)	Frequent	Frequent	Nil	Aesthetically superior.
Life / durability	Low	Low	High	Lasts the lifetime of your home.

Other advantages of Johnson Endura are that it is fade resistant, ecologically compatible, and environmentally green with no chemical or toxic substances, it is odourless and has good heat energy retaining and conducting (conserving) properties. It is not inflammable and is also UV resistant.

Q3. What if any object falls on Endura Industrial Tiles? Will the tile break?

A. Endura Industrial tiles can withstand normal impact. They have been tested in automobiles garages where various implements and equipment often keep falling with no significant

damage to tiles. However, the tiles are not unbreakable and hence the extent of damage, if any, would depend on the weight and shape and height of fall of the falling object. We therefore recommend a gap of few mm between tiles for easy maintenance or replacement, in the event of any damage.

Q4. What are the advantages of Endura Industrial Tiles over cement concrete tiles and Epoxy floors over a long term?

A. Cement and Cement concrete tiles tend to pit that form pot holes on usage. In epoxy floors, there is a tendency to develop micro cracks which then tend to peel-off the floor. In both these cases it is difficult to repair the floor. When Endura Industrial floors are installed with proper spacing and grouting, they can be easily repaired by replacing the damaged tile.

Q5. Do Endura Industrial Tiles stain easily?

A. Endura Industrial is a vitrified tile with a very low water absorption. It is highly stain resistant as compared to most natural stones. The application of special over-spray helps seal any residual micro porosity and enhances the stain resistance of the tile.

Q6. Are Endura Industrial tiles good for using above waterproofing surfaces? Do they help in waterproofing?

A. Endura Industrial tiles are most suited for use over waterproofed terraces as they withstand all the weathering effects roofs are exposed to and insulate against expansion and contraction of the waterproofing layer below. Normally dust on the roof and movement of people leads to abrasion of the waterproofing layer. Endura tiles on a waterproofed roof helps protect this surface. Care should be taken to test the waterproofing layer prior to tiling and tile joints should be sealed properly with epoxy or any other water-proof grouting material.

Q7. Is Endura Industrial Tile available in various shapes?

- A. Endura Industrial tiles come in squares and rectangles. This makes it convenient to cut and create any designs or pattern as desired at the time of laying. Cement concrete tiles are cast into shapes and these cannot be cut.

Q8. What is the best way to fix Endura Industrial Tiles?

- A. Endura Industrial tiles are best fixed using ARDEX ENDURA Tile Fixing Adhesive and the gap between the tiles can be filled with ARDEX ENDURA grouts. ARDEX ENDURA Tile Fixing Adhesives and Grouts are available in India and are most compatible with Endura tiles.

Q9. Are Endura Industrial tiles acid / alkali resistant?

- A. Endura Industrial tiles are resistant to all alkalis and all acid (in high concentration), except HF or their derivatives.

Q10. In what sizes and thicknesses are Endura Industrial tiles available?

- A. Endura Industrial tiles are available in the following sizes and thicknesses: 30x30-2cm, 30x30-1.5cm, 30x30-1.2cm, 20x20-1.5cm, 20x20-1.2cm, 20x10-2cm, 20x10-1.5cm, 20x10-1.2cm.

Q11. Why are Anti-Static tiles required?

- A. Static charge is a constant source of problem in various industrial processes, in areas where highly sensitive electronic or computing equipments are in operation, and in many areas of industries where inflammable chemicals or explosives are being used. In such areas sparking resulting from build up of static charge can become a major fire hazard. The use of antistatic conductive and dissipative flooring products helps conduct the static charge away, thus eliminating the hazard.

Q12. Is the Anti-Static effect on Endura tiles long lasting?

- A. The Anti-Static ceramic tiles (dissipative & conductive variety) are produced by mixing fine semi-conducting oxide powders into the ceramic glaze. Firing of the glaze to a high temperature results in sintering and formation of a stable electrically conducting network of ions in solid solution. This electrically conducting network is fused on the tile, thus making the Antistatic effect permanent for the lifetime of the product.

Q13. How do Anti-Static tiles help reduce fire hazards?

- A. Static electricity accumulates on the surface of any floor be it natural stone, ceramic tile or other flooring material. This static electricity is accumulated due to the friction between any two surfaces like shoes and the floor. Endura Anti-Static tiles are manufactured using a specially formulated conducting glaze that carries the static electricity charge from the surface of the tile to ground thus eliminating the fire hazard.

Q14. Which are the application areas recommended for Endura Anti-Static tiles?

- A. Recommended application areas for Endura Antistatic tiles are Server rooms, Computer Data Center rooms, PLC Panel rooms, PCB Manufacturing units, Laboratories handling sensitive equipment or chemicals, Petro chemical industries, Shell making factories, Ordnance factories and other Defence factories, Bulk Drug plants, Chemical and Fertilizer plants, etc.

Q15. What are the other advantages of using Endura Anti-Static tiles?

- A. Apart from Anti-Static property Endura Anti-Static tiles are highly abrasion resistant, have superior chemical durability, very high mechanical strength and are stain-proof.

Q16. What are the advantages of Anti-Static Endura tiles versus Vinyl or Epoxy based Polymer tiles and conducting rubber based flooring products?

Comparison between Endura Antistatic Tile & Vinyl Flooring

S. No.	Properties	Vinyl/Epoxy/ Rubber Anti-Static Floor	Endura Anti-Static Tile
1	Abrasion Resistance	Will easily scratch & tear	Will not tear & is highly scratch resistant
2	Chemical Resistance	Easily reacts with mild acids and alkalis	Very high resistance to even concentrated acids & alkalis
3	Durability	Low	Very high
4	Stain Resistant	Easily stains	Stain resistant
5	Color Permanence	Fades with time	Color is permanent
6	Hygiene	Dampness or humidity causes fungus formation	Glazed surface is impervious and is easy to clean and maintain
7	Maintenance	High Maintenance	Virtually no maintenance
8	Fire Resistant	Susceptible to fire	Fire resistant
9	Mechanical Strength	Low	High
10	Impact Resistance	Low	High

Q17. What is the recommended procedure for installing Endura Anti-Static tiles?

- A. Endura Anti-Static tiles can be installed using conventional cement - sand mortar or using synthetic adhesives such as ARDEX ENDURA and maintaining a 3mm to 5mm joint that is about 6mm to 8mm deep. Rake open the joints and fix good quality copper wire into the joints. The joints would then need to be sealed with conducting epoxy grout, to allow for a smooth discharge of any accumulated static charge.

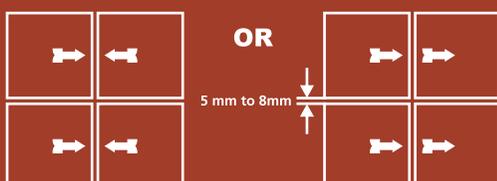
Tile Fixing Instructions*

1. Before fixing the tiles, lay them out in the desired pattern and make sure that they give an acceptable blend of shade, colour & design. Also make sure that the tiles are acceptable to your satisfaction. Please note that certain amount of shade and size variation is inherent in the manufacturing of ceramic products.
2. For fixing these tiles, we recommend the use of ARDEX ENDURA tile fixing adhesives. For best results, follow the tile fixing instruction provided along with the adhesives.
3. For fixing Johnson Endura tiles on the floor using sand and cement, follow the instruction given below :
 - a) Use cement and sand mortar in the ratio of 1 : 4. Add some water to create a consistent paste.
 - b) Do not add any further water to the mix once it is completed and use the same within one hour.
 - c) Apply a 20mm to 30mm layer of bedding material over an area of 1 square meter at a time on the surface of the area. Apply a fine slurry to the back of the tile to ensure proper and full bedding. Press gently for even adherence at back of the tile.

DO NOT USE AN IRON HAMMER OR SOME HEAVY MATERIAL TO PRESS THE TILE.

4. For fixing Johnson Endura tiles on Dado, we recommend the use of tile fixing adhesive 'Gold Star' from ARDEX ENDURA. Please follow the manufacturer's instructions for the same. We do not recommend the use of sand and cement for fixing on Dado.
5. Mark and layout the tiles from the centre of the area to be tiled so that cut tiles if any will be on the outer edge towards the walls.
6. The nominal/ work size of the tile is as printed on the carton. It is advisable to maintain a gap of 5 mm to 8 mm between two tiles to allow for possible expansion as per ISO tolerance norms. This would give the coverage area as mentioned in the grouts.
7. Complete the tiles laying process by pressing the cut Johnson Endura tiles firmly into place along the wall / floors.
8. Allow 3 to 4 days for bed curing. After this period, fill the joints with cementitious or epoxy grouts from ARDEX ENDURA.
9. Fifteen minutes after finishing the grouting process, wipe off excess grout with a damp sponge and polish the tiles with a soft and dry cloth for a clean surface. The tiles can also be cleaned with a mild acid (However Hydrofluoric acid and its derivatives should not be used). You can also use tile & stone cleaners from ARDEX ENDURA.
10. Please note that the company does not accept any liability in case of problems arising out of non - adherence to these fixing instructions.
11. It is ideal to provide 5 mm to 8mm gap between tiles with the help of spacers.
12. Kindly look for an arrow (➡) on the back of the tile and follow the laying pattern as shown below.
13. THE COMPANY WILL BEAR NO RESPONSIBILITY AFTER THE TILES ARE FIXED.

NOTHING IN THESE INSTRUCTIONS IS A SUBSTITUTE FOR GOOD WORKMANSHIP AND SUPERVISION.



* Specific tile fixing instructions related to industrial tiles, swimming pool tiles, pavers, anti-static & special purpose acid/alkali/chemical resistance tiles, please visit the website www.enduratiles.com & contact company representative directly.

Success Stories

1 Johnson Endura tiles in a Spice Manufacturing Unit

A spice manufacturing unit in Andheri, Mumbai with IPS concrete flooring found the quality of the product hampered by the dust generated. After a warning from the Food and Drug Administration, an attempt was made with epoxy layers, which could not handle the stress well. Then their original flooring was replaced with Johnson Endura tiles. The result? A hygienic, safe spice production area – and a FDA approval.

2 Johnson Endura tiles in a Leather Stitching Factory

A Mohali-based leather-stitching factory with kota-stone flooring was dissatisfied. This dull and ugly flooring had deteriorated badly because of stress and stains by machine and trolley movement. The situation turned into a positive one when their flooring was replaced with Johnson Endura Tiles. The tiles looked good, remained scratch-free and breakage free resulting in low maintenance. The enhanced aesthetics earned praise from corporate buyers.

3 Johnson Endura Tiles in Places of Worship

A Gurudwara in Lucknow had kota-stone kitchen flooring which used to get wet easily. Because of the high footfalls during the langar, the wet flooring caused concern for the safety of the devotees. After the Gurudwara got this flooring replaced with Johnson Endura tiles, their problems were resolved. The new tiles provided grip, were breakage-free and made worship much safer.

4 Johnson Endura Tiles in a Manufacturing Industry

A shocker making unit in Gurgaon had problems with safety – oil spills made operations difficult. After considering other flooring options, Epoxy flooring was installed to combat this. The result was not satisfactory as the deterioration rate of Epoxy flooring was too high. The unit then decided on Johnson Endura tiles. This anti-skid and high-stress surface allowed for easier grip and unrestricted heavy-trolley movement. Resulting in high productivity and a shocker factory environment free of shocks.

5 Johnson Endura Tiles at a Fish Harbor

A fish harbor in Kerala had a rapidly degenerating floor because of the constant movement of fish carts, trucks, tempos, and crates on their concrete and kota flooring. This caused the flooring to

break leading to unhygienic conditions and waterborne diseases. This in turn worsened the quality of fish. They solved this long standing problem by replacing their flooring with heavy duty Johnson Endura Tiles which were cleaner, scratch-free and durable. The harbor was then successful in winning the confidence of consumers who visited the Cherai Harbour.

6 Johnson Endura Tiles in a Plastic Molding Unit

A plastic molding unit used kota-stone & mandana-stone on the floors in their Mumbai and Delhi factories. This always led to problems like breakage, stains and scratches during trolley movement. So when the time came for the management to make a choice for their Baddi branch they chose to go with Johnson Endura Tiles. Now the company spends a lot less on maintenance and has happier employees with increased levels of productivity.

7 Johnson Endura Tiles in Railway Battery Rooms

The battery rooms in the Railways used acid resistance bricks which were porous. They used to get stained easily and required high maintenance. The DE of Railways soon decided to put an end to this problem by replacing their flooring with Johnson Endura tiles. The results were there for everyone to see. The floors were finally easy to fix, stain free with low maintenance, making it more conducive for work.

8 Johnson Endura Tiles in Pulp Canning Units

A mango pulp canning unit had been facing a maintenance issue with their kadappa floors constantly chipping off and breaking. The floor also used to catch a lot of stains due to long storage periods of the mangoes. The troubled management of the unit decided to replace their problematic flooring with Johnson Endura Tiles and Epoxy Sealant after they got notified by the local pollution control officials. With new flooring their regular maintenance issues were solved and they got the ISO 14001 certification. The flooring change also helped the unit win canning sub-contracts for big brands like Frooti, Pepsi and Hindustan Coca Cola Beverages.

Select Clientele

FOOD PROCESSING :

- Ruchi Soya Oil Extraction Unit, Indore
- Nestle, Baddi
- Hindustan Unilever Ltd., Rajpura, Mysore, Nashik & Kolkata
- Tricom Agrochem Ltd., Pune
- Nilons Enterprise, Jalgaon
- ITC Ltd., Ranjangaon, Pune
- SDC Agrofoods, Hyderabad
- Ravindranath Fruit Canning Industries, Hyderabad
- FIL Industries Ltd., Jammu
- Perfetti Van Melle Pvt. Ltd., Manesar
- Narmada Drinks Pvt. Ltd., Bilaspur
- Cargill Industries, Daund, Pune
- Tetrapack Industries, Chakan, Pune
- Hindustan Coca Cola Beverages, Kheda, Hyderabad & Guntur
- Pepsico Holdings, Kanpur
- Dharampal Satyapal Ltd., Kullu, H.P.

BULK DRUGS :

- Alchem, Ankleshwar
- Sun Pharma, Ahmednagar
- Unichem, Roha
- Cadila, Ankleshwar
- Lupin Pharma, Boisar
- Nicholas Piramal, Mumbai
- Avantis, Ankleshwar
- Cipla Ltd., Patalganga, Kurkumbh & Bangalore
- Matrix Laboratories, Hyderabad & Vizag
- Dr. Reddy's Laboratories, Hyderabad & Vizag
- Covalent Labs, Hyderabad & Vizag
- Polydrug Pharma, Ambernath

PHARMACEUTICALS :

- Glaxo, Thane
- Johnson and Johnson, Mumbai
- Wockhardt Ltd., Aurangabad

DAIRY INDUSTRIES :

- Hatsun Foods, Dharmapuri
- Vijaya Dairy, Hyderabad
- Amul Dairy, Dharuhera, Manesar, Virar
- NDDDB, Anand
- Gokul Dairy, Kolhapur, Vashi
- Mother Dairy, Anand
- Milma Dairy, Wayanad
- Gowardhan Dairy, Parag Milk Foods, Pune, Chittoor

TEXTILES :

- Bombay Dyeing DMT Plant, Patalganga
- Reliance, Patalganga
- Lavino Kapur, Boisar
- Arvind Mills, Ahmedabad
- Alok Industries, Silvassa, Vapi
- Bombay Rayon, Boisar, Kolhapur & Bangalore
- Mandana Dyeing, Boisar
- Sheetal Fibre Ltd., Ludhiana
- Choudhary Fashions, Jaipur

PETROLEUM :

- Reliance Industries, Jamnagar, Patalganga
- GAIL Gas Pipe Line, Vizag, Vijayawada
- Guru Gobind Singh Refinery, Bathinda
- HPCL, Mahul
- BPCL, Mahul
- IOCL, Haldia, Mathura
- BPCL, Mumbai Manmad Pipe Line, Manmad Sawai Madhopur Extension

AUTO MOBILES :

- Ceat Shoppe, All India
- FIAT, All India
- Maruti, All India
- Mahindra & Mahindra, All India
- Volkswagen, All India

- Skoda India, All India
- BMW, All India
- Daimler India, All India
- Bharat Benz, All India
- Honda, All India
- Hyundai, All India
- Mahindra (Scorpio Showroom), Secunderabad
- Bajaj Auto Showroom, Ahmedabad

CORROSION PROTECTION APPLICATION :

- RCF Thal Plant
- Exide Industries Limited, Hosur in Tamilnadu

BREWERIES :

- Seagram, Nashik
- United Breweries, Aurangabad, Hyderabad, Orissa
- Arian Breweries, Jaipur
- SAB Miller, Aurangabad
- Varun Breweries, Noida
- Carlsberg India, Hyderabad

GOVERNMENT AGENCIES :

- BARC
- MES
- Railways
- Airport Authority of India
- WBTD, Murti
- Ichapur Rifle Factory, Ichapur
- Chittaranjan Locomotive Works, Chittaranjan
- CPWD, Kolkata

CHEMICAL PLANT :

- SD Finechem, Tarapur
- BASF, Mangalore
- Sarex Overseas, Tarapur
- Salvi Chemicals, Boisar
- Clariant Chemicals, Roha

- Jubilant Life Sciences, Bharuch
- Navin Chemical Enterprise, Dewas

PUBLIC SECTOR UNDERTAKING :

- ONGC
- HPCL
- BPCL

HEAVY INDUSTRIES AND OTHERS :

- Hindalco, Sambalpur
- Adhunik Alloys and Power Ltd., Jamshedpur

LEATHER TRADE :

- Reflexions Narayani Impex Pvt. Ltd., Kolkata

JOHNSON ENDURA ANTISTATIC TILES :

- Chemstroll Engineering, Goa
- Bilag Industries Ltd. (Bayer Group Company), Vapi
- MES, Vizag (Dolphin Nose Station Base)
- Department of Malaria Health Research Institute, Delhi
- Johnson Matthey India Pvt. Ltd., Taloja, Mumbai
- Aurobindo Pharma, Hyderabad & Vizag
- Mylan Labs, Hyderabad & Vizag
- Defense Research & development organization, Santosh Nagar, Hyderabad
- Dr. Reddy Laboratories, Hyderabad
- UP Projects Corporation Ltd. : 200 Bedded Mother & Child Referral Hospital, Gomti Nagar, Lucknow

Green Initiative



As a socially responsible company, Johnson has initiated a number of measures to reduce energy consumption and to conserve and preserve precious natural resources. Our manufacturing operations are increasingly using greener fuels like biomass and wind energy. We leverage local resources and manufacture and distribute locally in order to cut down on fuel consumption wasted in transportation. We also use minimum water, mostly harvested rainwater, reuse energy diligently and recycle waste. We have also installed high grade pollution abatement devices that restrict the release of noxious gases such as SO_x, NO_x and SPM into the environment. The company has registered two projects under the Clean Development Mechanism which is generating certified emission reduction (CER). Additionally, we have two projects on the VER+ scheme accruing VER+ credits. These initiatives have been recognized by external and Government agencies such as Gas Authority of India Limited (GAIL) and the Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India. The bigger reward, however, is the fact that we are leaving the planet behind for our children, like the way we found it. Pure and green.

Customers choosing to use our products can avail LEED or equivalent credits toward Green Building Certification under the following categories -

Material Resource : Use of local raw materials to reduce energy consumption during transportation - Available points 2.

Recycle Content : Use of recycled material in the manufacture of the product - Available points 2.

Certifications

Johnson is India's largest tile manufacturer. It's commitment to quality, service and innovation is backed by certification from world's leading accreditation bodies.

ISO – 9001:2008

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