

Ceramic



Porcelain

Index

Version 1

Glazed Ceramic Tiles

Johnson	91
Yek	95

Glazed Porcelain Tiles

Articulate	3
Romance	11
Ganister	21
Verbacious	31
Celtic	37
Stigmata	43
Medousa	63
Delectable	75
Cerastium	79
Jad	81
Jod	84
Johnson	95
Unique	98
Explicit	101

Polished Porcelain

Coumarin	25
Quantum	73

Fine Glazed Porcelain

Seraphic	56
----------------	----

Full Bodied Polished Porcelain Tiles

MML	47
Therz	67
Marrazzi	89

Listello / Tozetto Accesories

Metabolic	104
-----------------	-----

Technical	110
-----------------	-----



1METCROMAR25X50 250 x 500 mm



1METCROBEI25X50 250 x 500 mm



1METCROBL25X50 250 x 500 mm



250x500

Specifications

Ceramic Tile:
Available in size:
Thickness:

Metabolic
250 x 500 mm
8 mm



1METLISPIROJ7.5X50 7.5 x 50 mm



1METLISPRIMAR7.5X50 7.5 x 50 mm



1METLISPRINEG7.5X50 7.5 x 50 mm

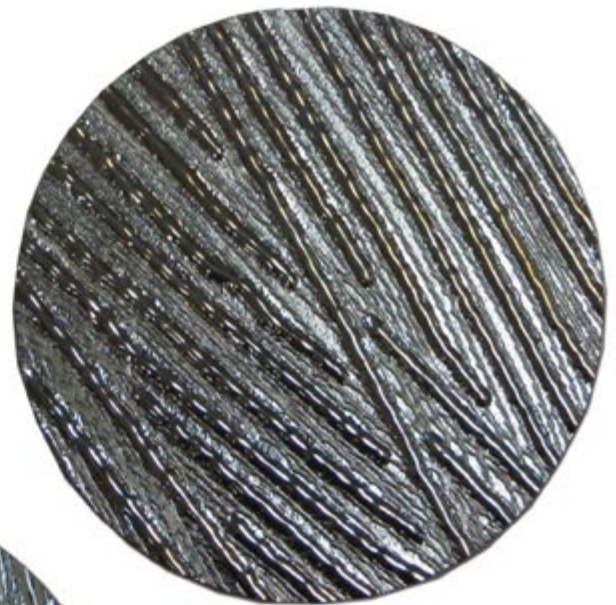
Specifications

Ceramic Listello Prisma: Metabolic
Available in size: 7.5 x 50 mm
Thickness: 8 mm





1METTOZPRIROJ120X120 120x120 mm



1METTOZPRIMAR120X120 120x120 mm



1METTOZPRINEG120X120 120x120 mm

Specifications

Ceramic Tozetto Prisma: Metabolic
Available in size: 120 x 120 mm
Thickness: 8 mm





1METLISMIRRO6X50 60x500 mm



1METLISMIRMAR6X50 60x500 mm



1METLISMIRNEG6X50 60x500 mm

Specifications

Ceramic Listello Mirta: Metabolic
Available in size: 60 x 500 mm
Thickness: 8 mm



Technical Specifications

METABOLIC						
Technical Supervisions Station for Porcelain Quality Supervision and Inspection						
Glazed Porcelain						
TEST REPORT						
No.	Test Item	Unit	Technical Requirement		Result	
1	Length	%	± 0.30	± 1.50 mm	± 0.12	499.9 \pm 0.60 mm
	Width		± 0.30	± 0.75 mm	± 0.16	249.6 \pm 0.40 mm
	Thickness		± 10	± 0.96 mm	± 10	9.60 \pm 0.96 mm
2	Straightness of sides	%	± 0.30	± 1.50 mm	$\pm 0.12/-0.12$	+0.60 mm/-0.60 mm
3	Squareness	%	± 0.50	± 2.50 mm	$\pm 0.16/-0.16$	+0.80 mm/-0.80 mm
4	Surface Flatness	%	+0.50/-0.30	± 2.50 mm/-1.50 mm	+0.18/-0.10	+0.90 mm/-0.50 mm
5	Water Absorption	%	>10			15.5
6	Breaking Strength	-	≥ 600 N			657 N
7	Modulus of Rupture		≥ 12 N/mm ²			21 N/mm ²
8	Coefficient of Expansion		Max. $9 \cdot 10^{-6} \text{ K}^{-1}$			$6,5 \cdot 10^{-6} \text{ K}^{-1}$
9	Thermal Resistance		Manufacturer's declaration			Resists
10	Crazing Resistance		Required			Resists
11	Resistance to Acids (Weak)		Citric Acid	Manufacturers declaration		Class GLA
			Hydrochloric Acid	Manufacturers declaration		Class GLA
			Potassium Hydroxide	Manufacturers declaration		Class GLA
12	Resistance to Acids (Strong)		Lactic Acid	Manufacturers declaration		Class GHA
			Hydrochloric Acid	Manufacturers declaration		Class GHA
			Potassium Hydroxide	Manufacturers declaration		Class GHA
13	Resistance to household cleaning products		Minimum GB			Class GA
14	Resistance to staining		Minimum Class 3			Class 5



Technical Specifications

The five most important technical features to consider when selecting and specifying ceramic and porcelain tiles for a specific application

* Dimensional Accuracy * Surface Flatness * Slip resistance * Ease of Maintenance * Durability

DIMENSIONAL ACCURACY

- ISO 13006 allows for a maximum deviation of $\pm 0.6\%$ in the length and width for ceramic and porcelain tiles, with a size greater than 200 x 200mm.

- This equates to a sizing tolerance as calculated in the following table:-

Tile Size	Allowable Deviation Parameters	Maximum Allowable Size Differential
300 x 300 mm	± 1.8 mm	3.6 mm
400 x 400 mm	± 2.4 mm	4.8 mm
600 x 600 mm	± 3.6 mm	7.2 mm
1000 x 1000 mm	± 6.0 mm	12.0 mm

- The most important factor to be considered here is joint width specification in the tiling layout.

SURFACE FLATNESS

- ISO 13006 allows for a maximum deviation from flatness of 0.5% for ceramic and porcelain tiles with a size greater than 200 x 200 mm.

- This equates to a warpage tolerance as calculated in the following table:-

Tile Size	Allowable Deviation Parameters	Maximum Allowable Warpage
300 x 300 mm	± 1.5 mm	3.0 mm
400 x 400 mm	± 2.0 mm	4.0 mm
600 x 600 mm	± 3.0 mm	6.0 mm
1000 x 1000 mm	± 5.0 mm	10.0 mm

- Consideration must be given to the possible complications when deciding on a staggered bond tiling layout.

SLIP RESISTANCE

- Slip and fall injuries are a leading cause of liability claims in public buildings

- Four test methods are used:

* Dynamic Slider * Static Slider * Inclined Platform * Pendulum

"R" Value information according to the German DIN 51130 Specification

R-Value	Category of static friction	Angle of Slope for ramps	Typical installation area examples
R9	Low	3° to 10°	Entry Foyer Hotel, Office, Shopping Centre - Excluding Food Court
R10	Normal	>10° to 19°	Shopping Centre - Food Court Toilet Facilities - Public Buildings
R11	Above Average	>19° to 27°	Commercial Kitchens catering <100 meals/day, Laundry and washing areas
R12	High	>27° to 35°	Commercial Kitchens >100 meals/day, Milk Processing, Pumping Room
R13	Very High	>35°	Fish Processing and tannery factories

While safety is a major factor to be considered in selecting floor finishes, it must be born in mind that there is a trade off between safety and ease of maintenance.

RESISTANCE TO STAINS

- ISO 10545 specifies a method for determining the resistance of glazed ceramic and porcelain tiles to staining.

- Test Solutions (staining agents):-

- * Stains leaving a trace (paste) : Chrome green or red oil (Fe_2O_3)
- * Stains having chemical action: Iodine
- * Stains forming a film : Olive Oil

Stain Resistance Rating	Cleaning Agent
5	Cleaned with Hot Water ($\leq 55^\circ C$)
4	Mild Detergent (not abrasive; ph 6.5 to 7.5)
3	Strong Detergent (abrasive; ph 9.0 to 10)
2	Solvents (Hydrochloric Acid; Potassium Hydroxide; Acetone)
1	Cannot be cleaned

RESISTANCE TO ABRASION

ISO 10547-7 Determines testing methodology of glazed porcelain and ceramic tiles against abrasion. This is a guide to the durability of a floor tile.

Two tests are conducted:

- 1) **M.C.C. Method:** A dry abrasive load consisting of porcelain cylinders and silicon carbide.
- 2) **P.E.I. Method:** A wet abrasive load consisting of steel balls and fused aluminium oxide and water

Dry Abrasion Test (MCC)		Wet Abrasion Test (PEI)	
Abrasion Stage (REV)	Class	Abrasion Stage (REV)	Class
500	I	150	I
1000	II	300-600	II
1500	III	750-1500	III
5000	IV	1500-3000	IV
		>3000	V

The PEI classification of a glazed floor tile recommends tiles with the following rating for these areas:

Class Rating	Suitable Application Area
I	Walked on barefoot or with soft soled shoes Bathrooms, Bedrooms
II	Walked on with normal footwear and occasional abrasive dirt. Living rooms of homes
III	Walked on frequently with normal footwear and increased abrasive dirt Kitchens; Corridors; Balconies
IV	Heavy foot traffic and greater amounts of abrasive dirt. Entrances - Restaurants
V	All heavy duty applications Commercial & Industrial areas