

Bologna, 17/12/13

Spett. le

ENERGIE KER (GOLD ART GROUP)
Via Giardini Nord, 231/233
41026 PAVULLO NEL FRIGNANO (MO)

TEST LABORATORY

Object:	Glazed ceramic tiles of different sizes marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".
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Summary of test results

The test results listed in the annex 1 relate to the test reports:

- N° 7123/13 dated 17/12/13 (determination of surface quality);
- N° 7124/13 dated 17/12/13 (determination of dimensions);
- N° 7125/13 dated 17/12/13 (determination of water absorption);
- N° 7126/13 dated 17/12/13 (determination of modulus of rupture);
- N° 7127/13 dated 17/12/13 (determination of scratch resistance);
- N° 7130/13 dated 17/12/13 (determination of crazing resistance);
- N° 7128/13 dated 17/12/13 (determination of resistance to surface abrasion of glazed tiles);
- N° 7129/13 dated 17/12/13 (determination of thermal expansion);
- N° 7131/13 dated 17/12/13 (determination of thermal shock resistance);
- N° 7133/13 dated 17/12/13 (determination of chemical resistance of glazed tiles);
- N° 7132/13 dated 17/12/13 (determination of frost resistance).



Prof. Eng. 
Director



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Testing and Materials

CENTRO CERAMICO BOLOGNA

Object: Glazed ceramic tiles of different sizes marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

Annex 1

CHARACTERISTICS	SASO 1030/1998	RESULTS	REQUIREMENTS (SASO 1031/1998)	CONCLUSION
Determination of surface quality. Number of tiles without defects	§ 2	30	≥ 95% free from visible defects	Complies
Determination of dimensions. The deviation in mm or in % of the average from the work size	§ 3	Length and width (%) : 0,4/-0,2 Thickness (mm) : 0,4 Straightness of sides (%) : -0,1/0,1 Rectangularity (%) : 0,2/-0,2 Surface flatness: centre curvature (%) : 0,1 edge curvature (%) : 0,3/-0,2 warpage (%) : 0,3	Length and width (%) : ±0,75 Thickness dev(mm) : ± 0,50 Straightness of sides (%) : ± 0,50 Rectangularity (%) : ± 0,60 Surface flatness: centre curvature (%) : ± 0,50 edge curvature (%) : ± 0,50 warpage (%) : ± 0,50	Complies
Determination of water absorption. Average value (%)	§ 7	0,16	≤ 3	Complies
Determination of modulus of rupture. Average value (N/mm ²)	§ 4	41,4	≥ 27	Complies
Determination of scratch resistance	§ 5	5	≥ 5	Complies
Determination of resistance to surface abrasion of glazed tiles	§ 11	IV	According to class specified by manufacturer	Complies
Determination of thermal expansion. Coefficient (10 ⁻⁶ K ⁻¹)	§ 9	6,6	≤ 9	Complies
Determination of thermal shock resistance	§ 8	Resistant	Required	Complies
Determination of crazing resistance	§ 6	Resistant	Required	Complies
Determination of frost resistance	§ 14	Resistant	Required if agreed	Complies
Determination of chemical resistance of glazed tiles. Resistance to staining. Resistance class.	§ 13	1 - 2	≤ 2	Complies
Resistance to household chemicals and swimming pool water cleansers excepting to cleansing agents containing hydrofluoric acid and its compounds. Resistance class.	§ 13	AA	≤ B	Complies
Resistance to acids and alkalies (with the exception of hydrofluoric acid and compounds). Resistance class.	§ 13	AA	Required if agreed and according to the chemical resistance class indicated by the manufacturer	Complies

CP

Prof. Eng. *Stefano Vincellini*
Director
CENTRO CERAMICO



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LABORATORIO DI ZONA

Via Valle d'Aosta, 1 - 41049 Sassuolo
Tel. 0536 802154

Part. IVA 0094778-0375

Bologna, 17/12/13

TEST REPORT N° 7123/13

concerning ceramic tiles
according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) - Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	03/12/13
For the sample marked:	Glazed ceramic tiles of different sizes marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

SSA 1030/1998 § 2 - Determination of surface quality

Number of tiles tested:

30

THE VISIBLE SURFACE DEFECTS UNDER THE CONDITION REQUIRED BY THE STANDARD
(cite the number of defected tiles for every defect type)

Cracks

0

Specks and spots

0

Crazing

0

Underglaze faults

0

Glaze shrinkage

0

Decorating faults

0

Unevenness

0

Shading

0

Depressions

0

Nipped edges

0

Holes

0

Nipped corners

0

Glaze devitrification

0

Number of tiles without defects:

30

SSA 1031/1998 § 5.2.3 - Table 3: Surface quality requirements

Minimum 95% of tiles shall be free from visible defects that would impair the appearance of a major area of tiles

Prof. Eng. 
Director



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Bologna, 17/12/13

Spett.le

ENERGIE KER (GOLD ART GROUP)

Via Giardini Nord, 231/233

41026 PAVULLO NEL FRIGNANO (MO)

TEST LABORATORY

TEST REPORT N° 7124/13

concerning ceramic tiles according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	03/12/13
For the sample marked:	"Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

The results reported relate only to the samples tested.

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DESCRIPTION OF THE SAMPLE:

Glazed ceramic tiles 30,8 x 61,5 x 0,9 cm marked
"Low water absorption tiles manufactured by ENERGIE KER
(GOLD ART GROUP)".

MANUFACTURER: ENERGIE KER (GOLD ART GROUP)

SAMPLING DETAILS:

- Where: -----
- Date: -----
- By whom: CUSTOMER
- How (methods): -----

DATE OF RECEIVAL IN LABORATORY: 03/12/13

TESTS PERFORMED:

	Date of starting	Date of ending
<input checked="" type="checkbox"/> SSA 1030/1998 § 3 Determination of dimensions	04/12/13	04/12/13

SSA 1030/1998 § 3 - Determination of dimensions

Work size (W) - mm:

304x611

Thickness - mm:

8,9

§ 3.1 - Length and width

	Side A (mm)	Side B (mm)	Side C (mm)	Side D (mm)	Average A-C (mm)	Deviat. % from W (mm)	Average B-D (mm)	Deviat. % from W (mm)
1	304,6	611,2	304,8	610,9	304,7	0,2	611,0	0,0
2	305,2	610,9	305,4	610,5	305,3	0,4	610,7	0,0
3	304,8	610,5	305,2	610,4	305,0	0,3	610,4	-0,1
4	304,6	610,4	304,4	610,3	304,5	0,2	610,4	-0,1
5	304,9	610,6	304,6	610,3	304,8	0,3	610,4	-0,1
6	305,2	610,1	304,6	609,6	304,9	0,3	609,8	-0,2
7	305,3	610,1	304,4	610,3	304,9	0,3	610,2	-0,1
8	305,3	610,1	304,5	610,1	304,9	0,3	610,1	-0,1
9	305,3	610,3	305,1	610,4	305,2	0,4	610,3	-0,1
10	304,9	610,2	304,4	610,2	304,6	0,2	610,2	-0,1

Average size of the 10 test specimens A - C (mm) :

304,9

Average size of the 10 test specimens B - D (mm) :

610,4

SSA 1031/1998 § 5.2.3 – Table 3: Dimensional tolerance requirements

Length and Width			
		Tolerance	
		Wall Tiles	Floor Tiles
The deviation in % of the average size for each tile (2 or 4 sides) from the work size			±0,75
	For W ≤ 120 mm	±0,75	
	For W ≥ 120 mm	±0,50	

SSA 1030/1998 § 3 - Determination of dimensions

Work size (W) - mm:

304x611

Thickness - mm:

8,9

§ 3.2 - Thickness

	I (mm)	II (mm)	III (mm)	IV (mm)	Average (mm)	Deviat mm from thickness.
1	9,4	9,2	9,2	9,2	9,3	0,4
2	9,2	9,3	8,7	9,6	9,2	0,3
3	9,2	9,0	8,9	9,4	9,1	0,2
4	9,0	9,1	9,0	9,4	9,1	0,2
5	9,3	9,0	8,9	8,7	9,0	0,1
6	8,9	8,7	9,0	9,1	8,9	0,0
7	9,0	8,8	9,0	9,0	9,0	0,1
8	9,0	8,9	8,7	8,9	8,9	0,0
9	9,2	9,0	8,9	8,8	9,0	0,1
10	8,8	8,8	8,8	8,9	8,8	-0,1

SSA 1031/1998 § 5.2.3 – Table 3: Dimensional tolerance requirements

Thickness		Tolerance	
		Wall Tiles	Floor Tiles
The deviation in mm of the average thickness of each tile from the work size thickness			±0,50
	Surface area up to 250 cm ²	±0,50	
	Surface area from 251 cm ² to 500 cm ²	±0,60	
	Surface area from 501 cm ² to 1000 cm ²	±0,70	
	Surface area more than 1001 cm ²	±0,80	

SSA 1030/1998 § 3 - Determination of dimensions

Work size (W) - mm:

304x611

Thickness - mm:

8,9

§ 3.3 - Straightness of sides

	Side A (mm)	Side B (mm)	Side C (mm)	Side D (mm)
1	0,1	0,2	0,0	0,2
2	0,1	0,3	0,0	0,1
3	-0,2	0,1	0,0	0,2
4	-0,2	0,2	0,1	0,1
5	-0,1	0,2	-0,1	0,1
6	-0,1	0,2	-0,1	0,2
7	0,0	0,2	-0,1	0,2
8	0,0	0,1	0,0	0,1
9	-0,4	0,2	0,0	0,2
10	0,0	0,2	-0,1	0,0

Maximum deviation from straightness (%):

-0,1

0,1

SSA 1031/1998 § 5.2.3 – Table 3: Dimensional tolerance requirements

Straightness of Sides		
	Tolerance	
	Wall Tiles	Floor Tiles
The maximum deviation from straightness in % related to the corresponding work sizes	±0,30	±0,50

SSA 1030/1998 § 3 - Determination of dimensions

Work size (W) - mm:

304x611

Thickness - mm:

8,9

§ 3.4 - Rectangularity

	Side A (mm)	Side B (mm)	Side C (mm)	Side D (mm)
1	0,1	0,3	0,0	0,4
2	-0,1	-0,1	0,0	-0,7
3	0,5	0,3	0,0	-0,2
4	0,3	-0,8	0,0	-0,6
5	-0,1	-0,5	0,3	-0,6
6	-0,1	-0,9	0,3	0,0
7	-0,2	-0,4	0,3	-0,4
8	-0,2	-0,5	0,3	-0,5
9	0,3	-0,9	0,2	0,1
10	-0,1	-0,4	0,2	0,8

Maximum deviation from rectangularity (%):

0,2

-0,2

SSA 1031/1998 § 5.2.3 – Table 3: Dimensional tolerance requirements

Rectangularity		
	Tolerance	
	Wall Tiles	Floor Tiles
The maximum deviation from rectangularity in % related to the corresponding work sizes	±0,50	±0,60

SSA 1030/1998 § 3 - Determination of dimensions

Work size (W) - mm:

304x611

§ 3.5 - Surface flatness**- Centre curvature**

	I (mm)	II (mm)	III (mm)	IV (mm)
1	0,2	0,3	0,3	0,4
2	0,4	0,8	0,2	0,9
3	0,3	0,8	0,3	0,6
4	0,4	0,4	0,3	0,4
5	0,2	0,5	0,2	0,5
6	0,1	0,7	0,1	0,9
7	0,2	0,5	0,1	0,7
8	0,2	0,7	0,1	0,6
9	0,2	0,6	0,3	0,6
10	0,3	0,3	0,3	0,4

Maximum centre curvature (%), related to diagonal calculated from the work size (W):

0,1

- Edge curvature

	Side A (mm)	Side B (mm)	Side C (mm)	Side D (mm)
1	0,5	-0,8	0,4	-0,9
2	0,7	-0,8	0,7	-0,9
3	0,5	-1,1	0,6	-1,1
4	0,8	-0,9	0,7	-0,9
5	0,6	-0,9	0,6	-0,9
6	0,8	-0,8	0,5	-0,9
7	0,8	-0,9	0,5	-0,8
8	0,9	-0,9	0,5	-0,9
9	0,5	-0,9	0,6	-0,9
10	0,6	-0,9	0,6	-0,9

Maximum edge curvature (%), related to the corresponding work size (W):

0,3

-0,2

SSA 1030/1998 § 3 - Determination of dimensions

Work size (W) - mm:

304x611

- Warpage

	I (mm)	II (mm)	III (mm)	IV (mm)
1	0,9	-0,1	0,9	0,1
2	1,1	-0,6	1,1	-0,7
3	1,9	-0,4	1,7	-0,5
4	0,8	-0,5	1,1	-0,4
5	0,8	-0,3	1,0	-0,3
6	1,2	-0,7	0,8	-0,6
7	1,1	-0,7	1,1	-0,9
8	1,4	-0,6	1,4	-0,9
9	1,1	0,1	1,5	0,1
10	0,5	-0,5	0,4	-0,4

Maximum warpage (%), related to diagonal calculated from the Work size:

0,3

SSA 1031/1998 § 5.2.3 – Table 3: Dimensional tolerance requirements

Surface flatness		Tolerance	
		Wall Tiles	Floor Tiles
The maximum deviation from the flatness in %	Centre curvature, related to diagonal calculated from the work sizes	+ 0,50/-0,30	±0,50
	Edge curvature, related to the corresponding work sizes	+ 0,50/-0,30	±0,50
	Warpage, related to diagonal calculated from the work sizes	±0,50	±0,50

Prof. Eng. Giorgio Timellini

Director


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LABORATORIO DI ZONA

Via Valle d'Aosta, 1 - 41049 Sassuolo
Tel. 0536 802154

Part. IVA 0094778-0375

Bologna, 17/12/13

TEST REPORT N° 7125/13

concerning ceramic tiles
according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) - Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	03/12/13
For the sample marked:	Glazed ceramic tiles of different sizes marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

SSA 1030/1998 § 7 - Determination of water absorption

Water absorption (%) of each individual tile:

1	2	3	4	5
0,11	0,12	0,26	0,14	0,18

Average water absorption (%):

0,16

Classification according to water absorption - SSA 1031/1998 § 4.3

4.3.1 Low water absorption tile ($W.A. \leq 3\%$)

4.3.2 Medium water absorption tile ($3 < W.A. \leq 10\%$)

4.3.3 High water absorption tile ($W.A. > 10\%$)

Prof. Eng. Giorgio Timellini
Director

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Tel. 0536 802154

Part. IVA 0094778-0375

Bologna, 17/12/13

TEST REPORT N° 7126/13

concerning ceramic tiles
according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) - Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	03/12/13
For the sample marked:	Glazed ceramic tiles 30,8 x 61,5 x 0,9 cm marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

SSA 1030/1998 § 4 - Determination of modulus of rupture

d - diameter of rods (mm):

20

t - thickness of rubber (mm):

5

l - overlap of tile beyond the edge supports (mm):

10

L - span of the support rods (mm):

590

Test specimens	1	2	3	4	5
Force (N)	948	869	928	962	892
Modulus of rupture (MPa)	43,1	39,5	41,2	42,7	40,6

Average modulus of rupture (MPa):

41,4

Requirements - SSA 1031/1998 § 5.2.4

Average modulus of rupture (MPa):

	Wall tiles	Floor tiles
		Vitrified ≥ 27
		Semivitrified ≥ 22
For thickness $\leq 7,5$ mm	≥ 15	
For thickness $> 7,5$ mm	≥ 12	

Prof. Eng. Giorgio Tonellini
Director

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Part. IVA 0094778-0375

TEST LABORATORY

Bologna, 17/12/13

TEST REPORT N° 7127/13

concerning ceramic tiles
according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) - Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	03/12/13
For the sample marked:	Glazed ceramic tiles of different sizes marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

SSA 1030/1998 § 5- Determination of scratch resistance

Test specimens	1	2	3	4	5
Mohs hardness	5	5	5	5	5

Requirements - SSA 1031/1998 § 5.2.4

Scratch hardness of surface (Mohs)	
Wall tiles	Floor tiles
≥3	≥5 (glazed)
	≥6 (unglazed)




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Director


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Bologna, 17/12/13

TEST REPORT N° 7128/13

concerning ceramic tiles
according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) - Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	03/12/13
For the sample marked:	Glazed ceramic tiles of different sizes marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

SSA 1030/1998 § 11 - Determination of resistance to surface abrasion of glazed tiles

Preparation of test specimens: by cutting.

Test method:

PEI



MCC



CLASSIFICATION:

Abrasion class:

IV

ABRASION STAGE:

PEI: failure visible at (rev.):

>1500

MCC: failure not visible at (rev.):

Requirements - SSA 1031/1998 § 5.2.4

According to class specified by manufacturer

Prof. Eng. Giorgio Timellin
Director

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Tel. 051 534015 - Fax. 051 530085

CERTI.CER.

LABORATORIO DI ZONA

Via Valle d'Aosta, 1 - 41049 Sassuolo
Tel. 0536 802154

Part. IVA 0094778-0375

Bologna, 17/12/13

TEST REPORT N° 7129/13

concerning ceramic tiles
according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) - Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	03/12/13
For the sample marked:	Glazed ceramic tiles of different sizes marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

SSA 1030/1998 § 9 - Determination of thermal expansion

Coefficient of linear thermal expansion (10^{-6} K^{-1}): **6,6**

Requirements - SSA 1031/1998 § 5.2.4

Coefficient of linear thermal expansion $\leq 9 \times 10^{-6} \text{ K}^{-1}$

Prof. Eng. Giorgio Tintellini
Director

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Part. IVA 0094778-0375

Bologna, 17/12/13

TEST REPORT N° 7130/13

concerning ceramic tiles
according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) - Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	03/12/13
For the sample marked:	Glazed ceramic tiles of different sizes marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

SSA 1030/1998 § 6 - Determination of crazing resistance

Number of test specimens:

5

Number of test specimens showing crazing:

0

Description of crazing :

See annex:

Requirements - SSA 1031/1998 § 5.2.4

Crazing resistance is required

Prof. Eng. Giorgio Timellini
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Tel. 0536 802154

Part. IVA 0094778-0375

Bologna, 17/12/13

TEST REPORT N° 7131/13

concerning ceramic tiles
according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) - Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	03/12/13
For the sample marked:	Glazed ceramic tiles of different sizes marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

SSA 1030/1998 § 8 - Determination of thermal shock resistance

Number of test specimens with visible defects:

0

- Type of failure (description)

- Cycle during which it occurred:

Requirements - SSA 1031/1998 § 5.2.4

Thermal shocks resistance is required



Prof. Eng. Giorgio Timellini
Director



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Part. IVA 0094778-0375

Bologna, 17/12/13

TEST REPORT N° 7132/13

concerning ceramic tiles
according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) - Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	27/11/13
For the sample marked:	Glazed ceramic tiles of different sizes marked "Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

SSA 1030/1998 § 14 - Determination of frost resistance

Number of tiles in the test sample:

5

Number of damaged tiles after the test:

0

Damages on the glaze or proper surface and the edges of tiles after the freeze-thaw test:

Requirements - SSA 1031/1998 § 5.2.4

Frost resistance is required if agreed.

Prof. Eng. Giorgio Tinelli
Director



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Part. IVA 0094778-0375

Bologna, 17/12/13

Spett.le
ENERGIE KER (GOLD ART GROUP)
Via Giardini Nord, 231/233
41026 PAVULLO FRIGNANO (MO)

TEST LABORATORY

TEST REPORT N° 7133/13

concerning ceramic tiles according to SSA 1031/1998

Requested by:	ENERGIE KER (GOLD ART GROUP) Via Giardini Nord, 231/233 41026 PAVULLO NEL FRIGNANO (MO)
On (date):	03/12/13
For the sample marked:	"Low water absorption tiles manufactured by ENERGIE KER (GOLD ART GROUP)".

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CENTRO CERAMICO - BOLOGNA

Test Report N° 7133/13 Date 17/12/13

Page 2 of 4

DESCRIPTION OF THE SAMPLE:

Glazed ceramic tiles of different sizes marked
"Low water absorption tiles manufactured by ENERGIE KER
(GOLD ART GROUP)".

MANUFACTURER: ENERGIE KER (GOLD ART GROUP)

SAMPLING DETAILS:

- Where: -----
- Date: -----
- By whom: CUSTOMER
- How (methods): -----

DATE OF RECEIVAL IN LABORATORY: 03/12/13

TESTS PERFORMED:

		Date of starting	Date of ending
<input checked="" type="checkbox"/>	SSA 1030/1998 § 13 Determination of chemical resistance of glazed tiles	03/12/13	10/12/13

SSA 1030/1998 § 13 - Determination of chemical resistance of glazed tiles

Test solutions	CLASS OF RESISTANCE				
	Test specimen 1	Test specimen 2	Test specimen 3	Test specimen 4	Test specimen 5
Stains:					
Methylene blue	1	1	1	1	1
Potassium permanganate	2	2	2	2	2
Household Chemicals:					
Ammonium chloride	AA	AA	AA	AA	AA
Standard cleaning agent	AA	AA	AA	AA	AA
Swimming pool salts:					
Sodium hypochlorite	AA	AA	AA	AA	AA
Copper sulphate	AA	AA	AA	AA	AA
Acids:					
Hydrochloric acid	AA	AA	AA	AA	AA
Citric acid	AA	AA	AA	AA	AA
Alkali:					
Potassium hydroxide	AA	AA	AA	AA	AA

Pencil test and/or reflexion test are applicable: NOT

CLASSIFICATION	
Stains:	
Class 1:	stain removed by water
Class 2:	stain removed by cleaning agent
Class 3:	stain not removed
Household chemicals, swimming pool salts, acids and alkali (when pencil test and/or reflection test are not applicable):	
Class AA:	no visible effect
Class A:	slight change in appearance
Class B:	definitive change in appearance
Class C:	partial loss of the surface
Class D:	complete loss of the original surface

Requirements - SSA 1031/1998 § 5.2.4

Chemical properties		
	Wall Tiles	Floor Tiles
Resistance to staining of glazed tiles	≤ class 2	≤ class 2
Resistance to household chemical and swimming pool water excepting to cleaning agents containing hydrofluoric acid and its compounds	≤ class B	≤ class B (Glazed)
Resistance to acids and alkalies (with the exception of hydrofluoric acid and compounds).	Required if agreed and according to the chemical resistance class indicated by the manufacturer	Required if agreed and according to the chemical resistance class indicated by the manufacturer

Prof. Eng. Giorgio Timellini
Director