COPA
high quality quartz

COPA QUARTZ

PRODUCT SPECIFICATION SHEET

No. : XMIN190902083CCM
Date : Sep,11, 2019

Summary of test results:
(Average of results)

No.	Test item(s)	Test method(s)	Test result(s)
1	Absorption by weight	Refer to ASTM C97/C97M-18	0.06 %
	Density		2329 kg/m^3
2	Abrasion resistance(polished)	Refer to ASTM C241/C241M-15$^{\varepsilon 1}$	34
3	Modulus of rupture	Refer to ASTM C99/C99M-18	Dry condition: 61.9 MPa
			Wet condition: 63.8 MPa
4	Flexural strength	Refer to ASTM C880/C880M-18	Dry condition: 49.7 MPa
			Wet condition: 54.1 MPa
5	Compressive strength	Refer to ASTM C170/C170M-17	Dry condition: 221 MPa
			Wet condition: 227 MPa
6	Linear thermal expansion coefficient	ASTM C531-00(2012)	36.2×10^{-6}/°C
7	Specular gloss (60°) (polished)	Refer to ASTM D523-14	48.8
8	Surface Frictional Properties (polished)	ASTM E303-93(2013)	British Pendulum Number (BPN): 9
9	Heated pan test(polished)	ANSI Z124.6-2007 Section 5.6	After test, the sample had no visible blister, crazing, or color change in the surface.
10	Chemical resistance test(polished)	ANSI Z124.6-2007 Section 5.5	See the following

********** To be continued **********

1. Absorption by weight and density

Test Method:

Refer to ASTM C97/C97M-18 Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone

Specimens: artificial stone with one face polished, 50mm×50mm×20mm, 5pcs.

Test Result:

Specimens identification No.	1	2	3	4	5
Absorption by weight (%)	0.05	0.05	0.06	0.06	0.07
Mean water absorption (%)	0.06				
Standard deviation (%)	0.01				
Density (kg/m^3)	2329	2327	2331	2331	2328
Mean density (kg/m^3)	2329				
Standard deviation (kg/m^3)	2				

2. Abrasion resistance

Test Method:

Refer to ASTM C241/C241M-15$^{\varepsilon 1}$ Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic

Specimens: artificial stone with one face polished, 50mm×50mm×20mm, 3pcs.

Test Result:

Testing surface: polished

Specimens identification No.	1	2	3
Abrasive hardness	32	37	34
Mean abrasive hardness		34	

********** To be continued **********

3. Modulus of rupture

Test Method:

Refer to ASTM C99/C99M-18 Standard Test Method for Modulus of Rupture of Dimension Stone

Specimens: artificial stone with one face polished, 200mm×100mm×20mm, 10pcs.

Test Result:

Dry condition:

Specimens identification No.	1	2	3	4	5
Individual modulus of rupture value (MPa)	60.5	63.6	63.1	60.7	61.6
Mean modulus of rupture value (MPa)	61.9				
Standard deviation (MPa)	1.4				

Wet condition:

Specimens identification No.	1	2	3	4	5
Individual modulus of rupture value (MPa)	64.4	64.7	65.6	59.7	64.7
Mean modulus of rupture value (MPa)	63.8				
Standard deviation (MPa)	2.4				

********** To be continued **********

4. Flexural strength

Test Method:

Refer to ASTM C880/C880M-18 Standard Test Method for Flexural Strength of Dimension Stone

Specimens: artificial stone with one face polished, 350mm×100mm×20mm, 10pcs.

Test Result:

Dry condition:

Specimens identification No.	1	2	3	4	5
Individual flexural strength value (MPa)	49.9	49.9	48.1	50.2	50.3
Mean flexural strength value (MPa)	49.7				
Standard deviation (MPa)	1.0				

Wet condition:

Specimens identification No.	1	2	3	4	5
Individual flexural strength value (MPa)	53.8	54.0	55.7	53.5	53.7
Mean flexural strength value (MPa)	54.1				
Standard deviation (MPa)	0.9				

********** To be continued **********

5. Compressive strength

Test Method:

Refer to ASTM C170/C170M-17 Standard Test Method for Compressive Strength of Dimension Stone

Specimens: artificial stone with one face polished, 50mm×50mm×20mm, 10pcs.

Test Result:

Dry Condition:

Specimens identification No.	1	2	3	4	5
Individual compressive strength value (MPa)	226	221	227	216	215
Mean compressive strength value (MPa)	221				
Standard deviation(MPa)	6				

Wet Condition:

Specimens identification No.	1	2	3	4	5
Individual compressive strength value (MPa)	220	227	232	228	230
Mean compressive strength value (MPa)	227				
Standard deviation(MPa)	5				

********** To be continued **********

6. Linear thermal expansion coefficient

Test Method:

ASTM C531-00(2012) Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

Specimens: artificial stone with one face polished, 250mm×25mm×20mm, 4pcs.

Test Result:

Test temperature range: 23°C ~100°C

Specimens identification No.	1	2	3	4
Linear thermal expansion coefficient (10^{-6}/°C)	35.3	36.4	34.8	38.4
Mean value (10^{-6}/°C)	36.2			

7. Specular gloss

Test Method:

Refer to ASTM D523-14 Standard Test Method for Specular Gloss

Specimens: artificial stone with one face polished, 150mm×75mm×20mm, 2pcs

Angle of incidence: 60°

Testing surface: polished

Test Result:

Specimens identification No.	1	2
Individual average value	50.0	47.7
Mean value	48.8	

********** To be continued **********

8. Surface Frictional Properties

Test Method:

ASTM E303-93(2013) Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester

Specimens: artificial stone with one face polished, 200mm×150mm×20mm, 6pcs

Rubber slider: slider 57 (CEN rubber)

Testing surface: polished

Test Result:

Specimens identification No	1	2	3	4	5	6
Mean pendulum value (Wet condition)	10	8	10	10	8	10
British Pendulum Number (BPN)	9					

9. Heated pan test

Test Method:

ANSI Z124.6-2007 Plastic Sinks - 5.6 Heated pan test

Specimens: artificial stone with one face polished, 250mm×250mm×20mm, 2pcs

Testing surface: polished

Temperature: 185°C

Test Result:

After test, the samples had no visible blister, crazing, or color change in the surface.

********** To be continued **********

10. Chemical resistance test

Test Method:

ANSI Z124.6-2007 Plastic Sinks - 5.5 Chemical resistance test

Specimens: artificial stone with one face polished, 100mm×100mm×20mm, 15pcs

Testing surface: polished

Test Result:

Reagents	Test results	
	(Covered)	(Uncovered)
Naphtha	Unaffected	Unaffected
Ethyl alcohol	Unaffected	Unaffected
Amyl acetate	Unaffected	Unaffected
Commercial household ammonia (10% V/V)	Unaffected	Unaffected
Citric acid (10%)	Unaffected	Unaffected
Urea (6%)	Unaffected	Unaffected
Hydrogen peroxide solution (3%)	Unaffected	Unaffected
Concentrated sodium hypochlorite solution (effective chlorine ≥8%)	Affected	Affected
Toluene	Unaffected	Unaffected
Ethyl acetate	Unaffected	Unaffected
Lye solution (2% sodium hydroxide)	Unaffected	Unaffected
Acetone	Unaffected	Unaffected
Trisodium phosphate (5%)	Unaffected	Unaffected
Vinegar	Unaffected	Unaffected
Pine oil	Unaffected	Unaffected

Note: 1. "Affected": superficial surface changes which can be removable by sanding with 600 grit sandpaper, any resulting damage shall not impair the serviceability of the unit, and shall be easily repairable to original finish.
2. "Severe damage": Any resulting damage impairs the serviceability of the unit, and was not easily repairable to original finish.

********** End of report **********