TYPICAL PHYSICAL STRENGTH PROPERTIES OF PRO TILE

The following results of eight different tests show the typical physical strength properties of Pro Tile.

IMPACT STRENGTH

Date: September 19, 1983

General:
On the above date, laboratory testing was performed on specimens of modified cement mortar to determine impact strength.

Test specimens consisted of a 1/16" coating of modified mortar applied to a 16-inch patio tile. Specimens were tested in an air-dried condition. Specimens had cured thirty (30) days at the time of the test.

Test Summary:
A one pound steel ball having a diameter of 1.9" was dropped from a height of six feet onto the modified cement mortar.

Test Result:
An indentation with a diameter of 0.45" was visible but no sign of cracking was present.

RESISTANCE TO INDENTATION

Date: September 19, 1983

General:

On the above date, laboratory testing was performed on specimens of modified cement mortar to determine if indentation would occur under a certain load.

Specimens consisted of a 1/16" thick layer applied to a 16-inch square patio tile. The specimens were tested in an air-dried condition. Age of specimens at time of testing was 30 days.

Procedure:

For this test, metal rods were placed with one end bearing on the mortared surface. A load was then slowly applied to a predetermined value on the opposite end of the rod. After loading, a visual inspection was made to determine if any indentation was present.

Test Results:

Bearing Rod Diameter (In.)	Load Lbs.	Comments
3	5000	No Indentation
1	1000	No Indentation

SHEAR BOND ADHESION

Date: September 19, 1983

General:
On the above date, laboratory testing was performed on specimens of modified cement mortar to determine shear bond adhesion.

Specimens consisted of a 1/16" thick layer applied to the smooth side of 16" patio tiles. The specimens were tested in an air-dried condition.

Procedure:
A steel plate was epoxied to a section of mortar so that the plate face was parallel to the tile face. Upon hardening of the glue, the excess of mortar and glue not covered by the plate was removed. Area under plate was then calculated and a shearing load applied to failure. Specimens were epoxied at 28 days of age and tested upon hardening of glue.

Test Results:

SPECIMEN	ULTIMATE LOAD IN LBS	SHEAR BOND ADHESION (PSI)	AVERAGE
1	3800	270	
2	4200	300	
3	3800	260	280

TABER ABRASION

ASTM C-501-80, TABER ABRASION

General:

Laboratory testing was performed on specimens of modified cement mortar to determine taber abrasion.

Test:

A Taber Abraser, Model 503, was utilized using H-22 wheels with a 1000-gram load per wheel for 1000 cycles at 70 RPM. Weights before and after abrading were recorded and the wear index calculated.

Test Results:

Sample	Weight Before Abrading (Grams)	Weight After Abrading (Grams)	Weight Loss (Grams)	Wear Index
1	114.93	114.61	0.23	275.00
2	119.23	116.87	2.361	37.27
3	110.57	109.66	0.91	96.70
4	108.21	107.38	0.823	107.31
Average	113.24	112.13	1.11	79.28

FLEXURAL STRENGTH

Date: August 12, 1983

General:

On the above date, laboratory testing was performed on specimens of modified cement mortar to determine flexural strength of samples. These samples were marked modified and unmodified cement mortar.

Test specimens were tested in an air-dried condition. Test specimens had aged 34 days before testing.

Procedure:

Specimens were tested using a three point loading system. The following results were obtained.

Test Results - Modified:

Beam width (In.)	Beam Depth (In.)	Span Length (In.)	Ultimate Load (Lbs)	Flexural Strength	Average Flexural Strength
1.90	2.15	6	742	760	
1.90	2.23	6	928	870	820

Test Results - Unmodified:

Beam Width (In.)	Beam Depth (In.)	Span Length (In.)	Ultimate Load (Lbs)	Flexural Strength	Average Flexural Strength
1.94	1.89	6	312	410	
1.97	1.89	6	338	430	440

TEST RESULTS

ASTM C-109 "Compressive Strength" at 1, 3, 7 and 28 Days
COMPRESSIVE STRENGTH (PSI)

Sample	1 Day	3 Days	7 Days	28 Days
1	3950	6030	7100	7650
2	3950	6200	7180	8080
3	3800	6080	6750	7900
Average	3900	6100	7010	7880

ASTM C-190, "Tensile Strength" at 1, 3, 7 and 28 Days
TENSILE STRENGTH (PSI)

Sample	1 Day	3 Days	7 Days	28 Days
1	200	480	940	880
2	260	460	800	860
3	220	460	920	940
Average	230	470	890	890

ASTM C-531, "Linear Shrinkage and Thermal Expansion"
LINEAR SHRINKAGE @ 72°F (%)

2 Days	3 Days	5 Days	6 Days	7 Days	8 Days	9Days	13 Days	14 Days
-0.04%	-0.06%	-0.08%	-0.08%	-0.09%	-0.09%	-0.10%	-0.10%	-0.10%

Final Results: -0.10%
Thermal Expansion: -6