



# PRODUCT TESTING SERVICE

100 Clemson Research Blvd. Anderson, SC 29625 Tel (864) 646-TILE Fax (864) 646-2821

TCNA TEST REPORT NUMBER: TCNA-053-13 #1

PAGE: 1 OF 2

**TEST REQUESTED BY:** Dural USA  
Attn: Stefan Wild  
1080 A Duncan Avenue  
Chattanooga, TN 37404

**TEST SUBJECT MATERIAL:** Identified by client as: “Durabase CI++ Mat over OSB subfloor with 19.2” joist spacing”

**TEST DATE:** 3/23/13 – 3/24/13

**TEST PROCEDURE:** ASTM C627: “A Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester”

#### *Materials:*

A thin-set installation over a 48" x 59 1/4" OSB base was prepared using the following materials:

- 1) APA rated “Exposure 1” Tongue and Groove OSB subfloor; 23/32" thick
- 2) Prospec® Level Set® Primer
- 3) Prospec® PermaFlex 300 modified thin-set mortar
- 4) Durabase CI++
- 5) 12" x 12" Crossville Porcelain tiles (1/8" grout joints)
- 6) Prospec® ProColor Plus grout

#### *Base and Underlayment:*

The subfloor was installed by TCNA and the membrane, tile, and grout was installed by a representative from Dural USA.

The 23/32" OSB subfloor was nailed to four 2" x 2" joists spaced 19.2" O.C. to simulate the support provided in an actual installation. The tongue and groove seam was positioned 15" off the centerline of the system and perpendicular to the joist. The subfloor was nailed to the joists with 2" ring shank nails set at six-inch centers on the perimeter joists and twelve-inch centers on the intermediate joists. A 1/4" bead of construction adhesive was applied to each joist prior to nailing. Prior to applying the Durabase CI++, the subfloor was primed with Prospec® Level Set® Primer. The primer was mixed per manufacturer’s specifications and applied to the OSB subfloor with a sponge. The primer was allowed to dry for approximately 20 minutes before installation of the Durabase CI++.

Katelyn Simpson  
Laboratory Manager

**revised 7/24/13**

Date



# PRODUCT TESTING SERVICE

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TCNA TEST REPORT NUMBER: TCNA-053-12 #1

PAGE: 2 OF 2

**TEST SUBJECT MATERIAL:** Identified by client as: “Durabase CI++ Mat over OSB subfloor with 19.2” joist spacing”

*Base and Underlayment continued:*

Prospec® Permaflex 300 modified thin-set mortar, mixed with water per the manufacturer’s instructions, was troweled over the OSB subfloor with a 1/8" x 1/8" square-notched trowel. The thin-set mortar was first keyed-in with the flat side of the trowel and then combed with the notched side to form parallel ridges. The Durabase CI++ was cut in two pieces (59 ¼ " x 8 ½" and 59 ¼ " x 39 ½") and laid into the Prospec® Permaflex 300 modified thin-set mortar. The mat was then rolled with a 45 lb linoleum roller.

*Tile and Grout:*

Prospec® Permaflex 300 modified thin-set mortar, mixed with water per the manufacturer’s instructions, was immediately troweled over the Dural Durabase CI++ with a 1/4" x 3/8" square-notched trowel. The thin-set mortar was first keyed-in with the flat side of the trowel and then combed with the notched side to form parallel ridges. The 12" x 12" Crossville Porcelain tiles were set in the thin-set by pressing down and sliding the tiles in a direction perpendicular to the combed ridges. Special care was taken to ensure that the indentions in the membrane were filled and that the tiles were back buttered before setting. After the tiles were installed, the thin-set was allowed to cure for 24 hours before grouting.

Prospec® ProColor Plus grout, mixed with water per the manufacturer’s instructions, was forced into the 1/8" grout joints with a rubber float. Excess grout was removed with the edge of the float. The grout was allowed to set up for approximately 20 minutes before the installation was cleaned with a sponge and water. The grouted installation was subsequently allowed to cure for 38 days. At the end of the cure period, the installation was subjected to load cycling as defined in ASTM C627. The deflection of the plywood subfloor was measured under the wheel path midway between the 19.2" O.C. joists.

**TEST RESULTS:**

The installation completed fourteen cycles with no evidence of damage to the tiles or grout joints. The maximum deflection during cycling was approximately 0.067". All evaluation criteria were based on 8 tiles and 8 grout joints in the wheel path of the Robinson-Type Floor Tester.

**CONCLUSION:**

In accordance with the Performance-Level Requirement Guide and Selection Table of the 2012 *TCNA Handbook for Ceramic, Glass, and Stone Tile Installation* (page 31), the installation is classified as “EXTRA HEAVY”.

Katelyn Simpson  
Laboratory Manager

**revised 7/24/13**

Date



# PRODUCT TESTING SERVICE

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TCNA TEST REPORT NUMBER: TCNA-053-13 #2

PAGE: 1 OF 2

**TEST REQUESTED BY:** Dural USA  
Attn: Stefan Wild  
1080 A Duncan Avenue  
Chattanooga, TN 37404

**TEST SUBJECT MATERIAL:** Identified by client as: "Durabase CI++ Mat over OSB subfloor with 24" joist spacing"

**TEST DATE:** 3/20/13 -3/21/13

**TEST PROCEDURE:** ASTM C627: "A Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester"

#### *Materials:*

A thin-set installation over a 48" x 73 1/2" OSB base was prepared using the following materials:

- 1) APA rated "Exposure 1" tongue and groove OSB subfloor; 23/32" thick
- 2) Prospec® Level Set® primer
- 3) Prospec® Permaflex 300 modified thin-set mortar
- 4) Durabase CI++
- 5) 12" x 12" Crossville Porcelain tiles (1/8" grout joints)
- 6) Prospec® ProColor Plus grout

#### *Base and Underlayment:*

The subfloor was installed by TCNA and the membrane, tile, and grout was installed by a representative from Dural USA.

The 23/32" OSB subfloor was nailed to four 2" x 2" joists spaced 24" O.C. to simulate the support provided in an actual installation. The tongue and groove seam was positioned 15" off the centerline of the system and perpendicular to the joist. The subfloor was nailed to the joists with 2" ring shank nails set at six-inch centers on the perimeter joists and twelve-inch centers on the intermediate joists. A 1/4" bead of construction adhesive was applied to each joist prior to nailing. Prior to applying the Durabase CI++, the subfloor was primed with Prospec® Level Set® primer. The primer was mixed per manufacturer's specifications and applied with a sponge to the OSB subfloor. The primer was allowed to dry approximately 20 minutes before installation of the Durabase CI++.

Katelyn Simpson  
Laboratory Manager

**revised 7/24/13**

Date



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TCNA TEST REPORT NUMBER: TCNA-053-12 #2

PAGE: 2 OF 2

**TEST SUBJECT MATERIAL:** Identified by client as: “Durabase CI++ Mat over OSB subfloor with 24” joist spacing”

*Base and Underlayment continued:*

Prospec® Permaflex 300 modified thin-set mortar, mixed with water per the manufacturer’s instructions, was troweled over the OSB subfloor with a 1/8" x 1/8" square-notched trowel. The thin-set mortar was first keyed-in with the flat side of the trowel and then combed with the notched side to form parallel ridges. The Durabase CI++ was cut in two pieces (73 1/2" x 8 1/2" and 73 1/2" x 39 1/2") and laid into the Prospec® Permaflex 300 modified thin-set mortar. The mat was rolled with a 45 lb linoleum roller.

*Tile and Grout:*

Prospec® Permaflex 300 modified thin-set mortar, mixed with water per the manufacturer’s instructions, was immediately troweled over the Durabase CI++ with a 1/4" x 3/8" square-notched trowel. The thin-set mortar was first keyed-in with the flat side of the trowel and then combed with the notched side to form parallel ridges. The 12" x 12" Crossville Porcelain tiles were set in the thin-set by pressing down and sliding the tiles in a direction perpendicular to the combed ridges. Special care was taken to ensure that the indentions in the membrane were filled and that the tiles were back buttered before setting. After the tiles were installed, the thin-set was allowed to cure for 24 hours before grouting.

Prospec® ProColor Plus grout, mixed per the manufacturer’s instructions, was forced into the 1/8" grout joints with a rubber float. Excess grout was removed with the edge of the float. The grout was allowed to set up for approximately 20 minutes before the installation was cleaned with a sponge and water. The grouted installation was subsequently allowed to cure for 35 days. At the end of the cure period, the installation was subjected to load cycling as defined in ASTM C627. The deflection of the plywood subfloor was measured under the wheel path midway between the 24" O.C. joists.

**TEST RESULTS:**

The installation completed seven cycles with no evidence of damage to the tiles or grout joints. At the completion of cycle eight (hard rubber wheels, three hundred pounds per wheel), one grout joint was cracked. At the completion of cycle fourteen (steel wheels, three hundred pounds per wheel), there was one additional cracked grout joint. The maximum deflection during cycling was approximately 0.073". All evaluation criteria were based on 8 tiles and 8 grout joints in the wheel path of the Robinson-Type Floor Tester.

**CONCLUSION:**

In accordance with the Performance-Level Requirement Guide and Selection Table of the 2012 *TCNA Handbook for Ceramic, Glass, and Stone Tile Installation* (page 31), the installation is classified as “HEAVY”.

Katelyn Simpson  
Laboratory Manager

**revised 7/24/13**

Date